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DEPARTMENT OF ENERGY

Management of Excess Uranium

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GAO Highlights

Highlights of GAO-15-475T, a testimony before the Subcommittee on Interior, Committee on Oversight and Government Reform, House of Representatives

Why GAO Did This Study

DOE maintains inventories of natural, enriched, and depleted uranium and periodically sells or transfers its excess uranium from its inventory. Under the Atomic Energy Act of 1954, as amended by the USEC Privatization Act, DOE's sales and transfers of uranium are subject to certain conditions. For example, according to the USEC Privatization Act, DOE must determine that any sales or transfers of uranium will not have an adverse material impact on the domestic uranium market, among other things. In 2008, DOE issued a plan for managing its excess uranium and adopted a guideline—after consultation with the uranium industry—to generally restrict its uranium sales and transfers to 10 percent of annual U.S. requirements for nuclear fuel. DOE updated its uranium management plan in July 2013 and announced that it would discontinue using its guideline.

This testimony discusses issues related to DOE's management of excess uranium and is based on seven prior GAO products issued from July 2006 through May 2014.

Over nearly a decade, GAO has made numerous recommendations to improve DOE's management of excess uranium, including seeking industry input on the amount of DOE uranium transfers the market can absorb annually and developing a consistent method for valuing depleted uranium tails. DOE has concurred and taken action on some recommendations and has disagreed with others. GAO will continue to monitor DOE's implementation of these actions. GAO is not making new recommendations in this testimony.

View GAO-15-475T. For more information, contact David C. Trimble at (202) 512-3841 or trimbled@gao.gov.

What GAO Found

GAO has identified four key issues related to the Department of Energy's (DOE) management of excess uranium and uranium transfers in reports, testimonies, and a legal opinion issued since 2006 as follows:

- **Elimination of a guideline to limit DOE's annual uranium sales and transfers.** In May 2014, GAO found DOE's decision to discontinue its 10 percent guideline for limiting uranium sales and transfers might introduce uncertainty in the uranium market by providing less transparency for DOE's future sales and transfers. In interviews with GAO, industry representatives said that DOE officials did not consult with the uranium industry before deciding to discontinue using its 10 percent guideline. The representatives said DOE's introduction of material into the uranium market is causing a deteriorating demand for non-DOE uranium and driving down uranium prices.
- **DOE's steps to assess the quality of market impact studies.** In part to ensure that its uranium transfers will not have an adverse material impact on the domestic uranium industry, DOE contracted for studies on the potential market impact of most of its planned uranium transfers. In GAO's September 2011 and May 2014 reports, GAO examined these studies and identified concerns with their analyses. For example, in 2014, GAO found that DOE did not take steps outlined in its contracts or in departmental quality assurance guidance to assess the technical quality of these studies. In addition, GAO also found in 2014 that the studies provided only limited detail about their methodology, data sources, and assumptions, although DOE's quality assurance guidance states that DOE information disseminated to the public should contain such information.
- **Legal concerns related to DOE's transfers of uranium.** In May 2014, GAO found legal concerns with four uranium transactions DOE conducted from 2012 through 2013. For example, for a transaction in May 2012, GAO concluded that DOE likely lacked authority to transfer depleted uranium "tails"—a product of the enrichment process—because of prohibitions imposed by the USEC Privatization Act. In July 2006 and September 2011, GAO found that certain of DOE's uranium transfers involving USEC—a former government-owned corporation that was privatized in 1998—did not comply with the miscellaneous receipts statute, which requires an official or agent of the government receiving money from any source on the government's behalf to deposit the money into the Treasury.
- **DOE's stewardship of its uranium resources.** In its May 2014 report, GAO found that DOE did not have consistent methods or guidance for valuing depleted uranium tails and questioned whether DOE received reasonable compensation for a large transfer of tails in 2012. Specifically, GAO found that DOE estimated the tails it transferred in 2012 for re-enrichment had a potential value ranging from $0 to $300 million, but DOE ultimately decided that the tails had no value and that the transfer had no cost to DOE. GAO concluded that, without consistent guidance for valuing its tails, DOE cannot ensure the government is reasonably compensated for its uranium transfers.

Chairman Lummis, Ranking Member Lawrence, and Members of the Subcommittee:

Thank you for the opportunity to discuss our work on the Department of Energy's (DOE) management of excess uranium, including its uranium transfers.[1] As you are aware, DOE maintains inventories of natural, enriched, and depleted uranium[2] and periodically sells or transfers excess uranium from its inventory.[3] For example, DOE regularly transfers uranium to contractors as payment for environmental cleanup services at its former uranium enrichment plant in Ohio in addition to using appropriated funds to support those activities. DOE has also transferred uranium to USEC, Inc. (USEC)—a former government-owned corporation that was privatized in 1998[4]—to support the development of next generation uranium enrichment technology and for other national security purposes.

Under the Atomic Energy Act of 1954, as amended by the USEC Privatization Act, DOE's sales and transfers of uranium are subject to certain conditions, including a required determination by the Secretary of

[1]We define uranium transfers as the exchange of natural, enriched, or depleted uranium, or uranium enrichment services between DOE and another party.

[2]A key step in processing uranium as a source of nuclear material for defense and commercial purposes is the enrichment of natural uranium. Enrichment is the process of separating uranium-235—the form, or isotope, that undergoes fission to release enormous amounts of energy in nuclear reactors and weapons—from uranium-238 to increase the concentration of uranium-235. The enrichment process results in two principal products: (1) enriched uranium hexafluoride, which can be further processed for specific uses, such as nuclear weapons or fuel for power plants, and (2) leftover "tails" of uranium hexafluoride, which also are called depleted uranium because the material is depleted in uranium-235 compared with natural uranium.

[3]DOE's inventory of uranium comes from a variety of sources, including the dismantling of some of the nation's nuclear weapons, as well as material remaining from U.S. government enrichment activities before 1993. In 1992, the U.S. government established the United States Enrichment Corporation (USEC) as a government corporation to take over operations of DOE's enrichment facilities and to provide commercial uranium enrichment services for the U.S. government and utilities that operate nuclear power plants. In 1998, USEC was privatized under the USEC Privatization Act. USEC Privatization Act, 42 U.S.C. §§ 2297h-2297h-13 (2015).

[4]USEC filed for Chapter 11 bankruptcy protection in March 2014 and emerged from Chapter 11 reorganization in September 2014 under the name Centrus Energy Corp. For the purposes of this testimony, we will refer to the company as USEC because all uranium transactions discussed in this testimony occurred while the company was named USEC.

Energy that the transfer will not have an adverse material effect on the domestic uranium market.[5] Since 2006, we have issued four reports, two testimonies, and a legal opinion that have addressed DOE's management of its excess uranium, as well as uranium transfers that DOE has conducted.[6] For example, in a March 2008 report, we found that DOE likely does not have the authority to sell depleted uranium tails—a product of the enrichment process.[7] In addition, in July 2006 and September 2011, we reported on the legal bases for certain DOE uranium transactions involving USEC and concluded that DOE had violated federal fiscal law because it did not deposit the net proceeds of certain transactions into the Treasury.[8] More recently, in May 2014, we reported on four uranium transfers DOE conducted involving USEC, and we identified numerous issues related to the transparency of DOE's uranium transfers, including concerns with DOE's assessment of the market impact of its transfers, the legality of the transfers, and DOE's methods for valuing depleted uranium tails.[9]

[5]See Atomic Energy Act of 1954 §§ 53, 63, codified as amended at 42 U.S.C. §§ 2073, 2093 (2014); USEC Privatization Act § 3112(d), codified as amended at 42 U.S.C. § 2297h-10 (2015).

[6]GAO, *Department of Energy: Enhanced Transparency Could Clarify Costs, Market Impact, Risk, and Legal Authority to Conduct Future Uranium Transactions*, GAO-14-291 (Washington, D.C.: May 9, 2014); GAO, *2012 Annual Report: Opportunities to Reduce Duplication, Overlap and Fragmentation, Achieve Savings, and Enhance Revenue*, GAO-12-342SP (Washington, D.C.: Feb. 28, 2012); GAO, *Excess Uranium Inventories: Clarifying DOE's Disposition Options Could Help Avoid Further Legal Violations*, GAO-11-846 (Washington, D.C.: Sept. 26, 2011); GAO, *Nuclear Material: DOE's Depleted Uranium Tails Could Be a Source of Revenue for the Government*, GAO-11-752T (Washington, D.C.: June 13, 2011); GAO, *Nuclear Material: Several Potential Options for Dealing with DOE's Depleted Uranium Tails Could Benefit the Government*, GAO-08-613T (Washington, D.C.: Apr. 3, 2008); GAO, *Nuclear Material: DOE Has Several Potential Options for Dealing with Depleted Uranium Tails, Each of Which Could Benefit the Government*, GAO-08-606R (Washington, D.C.: Mar. 31, 2008); and GAO, *Department of Energy: December 2004 Agreement with the United States Enrichment Corporation*, B-307137 (Washington, D.C.: July 12, 2006).

[7]See GAO-08-606R. The recommendations we made to address this issue, along with their status, are discussed later in this statement.

[8]See GAO-11-846 and B-307137. In 2011, we also reported on the market analyses for certain DOE uranium transactions involving USEC. The recommendation we made to address this issue, along with its status, is discussed later in this statement.

[9]See GAO-14-291. The recommendations we made to address these issues, along with their status, are discussed later in this statement.

In this context, my testimony today discusses DOE's management of excess uranium. Specifically, I will address four aspects of DOE's management of uranium about which we have raised issues in previous products since 2006: (1) DOE's elimination of a guideline to limit its annual uranium sales and transfers, (2) DOE's steps to assess the technical quality of uranium market impact studies for which it contracted, (3) legal concerns related to DOE's transfers of uranium, and (4) DOE's stewardship of its uranium resources. My testimony is based on our four reports, two testimonies, and a legal opinion issued from July 2006 through May 2014. Detailed information about the scope and methodology used to conduct this work can be found in each of our issued products. We conducted the work on which this statement is based in accordance with generally accepted government auditing standards. Those standards require that we plan and perform the audit to obtain sufficient, appropriate evidence to provide a reasonable basis for our findings and conclusions based on our audit objectives. We believe that the evidence obtained provides a reasonable basis for our findings and conclusions based on our audit objectives.

Background

Since the 1940s, the federal government has been processing natural uranium into enriched uranium. Many decades of uranium enrichment have resulted in an extensive DOE inventory of natural, enriched, and depleted uranium.[10] For example, according to DOE officials, as of June 2014, DOE maintained approximately 525,000 metric tons of uranium in the form of depleted uranium tails, with varying residual concentrations of uranium-235. Tails have historically been considered waste and treated as an environmental liability; however, under certain conditions, some tails may have economic value and therefore be considered an asset. For example, tails can be profitably re-enriched and used in lieu of natural uranium when the price of natural uranium is high.

[10]Natural uranium is mined from the earth and contains 0.7% of the uranium-235 isotope, the isotope of uranium that undergoes fission to release energy in nuclear reactors and weapons. Enriched uranium contains greater than 0.7% uranium-235. Low-enriched uranium, which is used in commercial nuclear power reactors and for tritium production, typically has a concentration of 3 to 5 percent uranium-235. In contrast, depleted uranium—a product of the enrichment process generally treated as waste but that in some cases contains enough uranium-235 that it can be re-enriched—contains fewer isotopes of uranium-235 than occur in natural uranium.

In addition to economic considerations, the United States needs an assured source of low-enriched uranium to produce tritium, a radioactive isotope of hydrogen, used to enhance the power of U.S. nuclear weapons. To produce tritium, DOE has stated that it can only use low-enriched uranium with no obligation to other countries under international agreements to use it for only peaceful purposes.[11] As we reported in May 2014, in 2012 DOE transferred a significant quantity of depleted uranium tails to a third party, who contracted with USEC for re-enrichment of the tails.[12] DOE conducted this transaction in part to ensure the availability of a supply of unobligated low-enriched uranium for future tritium production.

The Atomic Energy Act of 1954, as amended, gives DOE general authority to transfer uranium related to its nuclear energy functions; to distribute natural uranium under certain conditions to qualified entities; and to sell, lease, grant, distribute, or otherwise make available enriched uranium under certain conditions. In 1996, Congress enacted the USEC Privatization Act to amend the Atomic Energy Act. The USEC Privatization Act restricted DOE's authority to conduct certain transfers of uranium.[13] In particular, Section 3112 prohibits DOE from transferring or selling uranium except as consistent with the act's terms and conditions. For example, DOE is authorized to sell natural uranium and low-enriched uranium from its stockpile if (1) the President determines the material is not necessary for national security needs; (2) the Secretary of Energy determines the sale will not have an adverse material impact on the domestic uranium mining, conversion, or enrichment industries; and (3) the price paid will not be less than the fair market value of the material. DOE has satisfied the second requirement for a secretarial determination with individual determinations of market impact signed by the Secretary of Energy for each transaction or group of transactions. To help inform the

[11]Uranium is considered unobligated when neither the uranium nor the technology used to enrich it carries an obligation from a foreign country requiring that the material only be used for peaceful purposes. These obligations are contained in international agreements to which the United States is a party. We reported in October 2014 on the basis for DOE's practice of using only domestic enrichment technology in the provision of unobligated uranium enriched for national security purposes. See GAO, *Department of Energy: Interagency Review Needed to Update U.S. Position on Enriched Uranium That Can Be Used for Tritium Production,* GAO-15-123 (Washington, D.C.: Oct. 14, 2014).

[12]See GAO-14-291.

[13]See USEC Privatization Act § 3112, codified as amended at 42 U.S.C. § 2297h-10 (2015).

Secretary's determinations, DOE has contracted with Energy Resources International, Inc. (ERI), a nuclear fuel consulting firm, to develop studies analyzing the potential impact of planned uranium transfers on the market and has previously made these studies available on its public website. With respect to the third requirement pertaining to fair market value, DOE previously maintained a pricing policy for uranium that at various times specified standard prices or a market value standard for depleted uranium.[14] Such a pricing policy generally informed DOE determinations as to the value of tails until the early 1990s, but DOE has not relied on this policy since the mid-1990s.

In March 2008, we reported on options for dealing with DOE's inventory of depleted uranium.[15] We recommended that the department develop a comprehensive uranium management assessment containing detailed information on the types and quantities of depleted, natural, and enriched uranium managed by DOE and a comprehensive assessment of the department's options for this material. DOE neither agreed nor disagreed with our recommendation but, in December 2008, DOE published its *Excess Uranium Inventory Management Plan*. The plan, which DOE developed with input from the uranium industry, detailed the amount of uranium held by the department and its plans for selling or transferring a portion of it. In addition, in 2008, DOE adopted a guideline to generally restrict sales and transfers of uranium to no more than 10 percent of the annual U.S. requirements for nuclear fuel which, according to DOE at the time, generally would ensure that such transfers would not have an adverse material impact on the domestic uranium industry. The guideline was established with input from representatives from the uranium industry and was intended, in part, to address concerns that DOE uranium sales could depress uranium prices and harm the domestic mining, conversion, and enrichment industries.[16] The Secretary of Energy also issued a policy

[14]See for example, DOE Pricing Policy Change for Sale of Uranium Depleted in Isotope U-235, 47 Fed. Reg. 17,110 (Apr. 21, 1982). See also notices from DOE's predecessors in operating the enrichment facilities, Atomic Energy Commission, Uranium Hexaflouride: Base Charges, Use Charges, Special Charges, Table of Enriching Services; Specifications and Packaging, 32 Fed. Reg. 16,289 (Nov. 29, 1967); Energy Research and Development Administration, Uranium Heraflouride (sic): Base Charges, Use Charges, Special Charges, Table of Enriching Services; Specifications, and Packaging: Revisions, 42 Fed. Reg. 51,635 (Sept. 29, 1977).

[15]See GAO-08-606R.

[16]Conversion is the process of converting mined natural uranium to a gas that can be used for enrichment.

statement in 2008 on the management of DOE's excess uranium inventory, which committed DOE to generally undertake transactions involving non-U.S. government entities in a transparent and competitive manner that is supportive of a strong domestic nuclear industry.[17] DOE updated its excess uranium management plan in July 2013. In that plan, DOE announced its decision to discontinue using its 10 percent guideline for limiting uranium sales and transfers and stated that that it could meet its statutory and policy objectives without one.

GAO's Work Has Raised Issues about DOE's Management of Excess Uranium

We have raised four key issues related to DOE's management of excess uranium in seven products issued since 2006. Specifically, in our work, we have found that (1) DOE will no longer use a guideline to limit its annual uranium sales or transfers; (2) DOE did not take steps to assess the technical quality of contracted market impact studies; (3) DOE's uranium transfers have in some cases violated federal law; and (4) DOE may not be effectively stewarding its uranium resources.

DOE Will No Longer Use a Guideline to Limit Its Annual Uranium Sales or Transfers

In our May 2014 report, we found that DOE's decision to discontinue using its guideline for limiting uranium sales and transfers might affect the transparency of DOE's future uranium sales and transfers.[18] During the course of our work for the May 2014 report, DOE officials told us that DOE was not obligated to establish a guideline and, according to DOE's July 2013 *Excess Uranium Inventory Management Plan*, the department determined that it could meet its statutory and policy objectives without a guideline. Instead, the plan states that DOE will review decisions to introduce uranium into the market every 2 years and will publish secretarial determinations with these decisions. In conducting the work for our May 2014 report, industry representatives we interviewed raised concerns about DOE's July 2013 plan, including the following:

- DOE officials did not consult with industry representatives before deciding to discontinue using its 10 percent sales and transfer guideline. DOE officials told us that the department did not specifically seek comment from industry representatives on its 2013 plan or its

[17] *Secretary of Energy's Policy Statement on Management of the Department of Energy's Excess Uranium Inventory* (Washington, D.C.: Mar. 11, 2008).

[18] See GAO-14-291.

decision to discontinue use of the 10 percent guideline but noted that industry representatives could request informal meetings with DOE to discuss their concerns. In addition, DOE officials told us that they have presented the department's plans and listened to views of interested stakeholders at formal industry meetings.

- DOE's introduction of material into the uranium market is causing further deteriorating demand for non-DOE uranium and driving down uranium prices. However, by eliminating its guideline without considering input from the domestic uranium industry, DOE has introduced uncertainty in the uranium market because DOE's uranium management plan provides less transparency on DOE's future uranium transfers for members of industry. The Uranium Producers of America—an association that promotes the viability of the domestic uranium industry—noted in a July 2013 statement that DOE's plan is ambiguous and lacks predictability, which is needed for the uranium industry—a sector that is currently struggling to secure capital to start up, sustain, or grow its operations. DOE's comments in response to our May 2014 report did not address industry concerns about reduced transparency.

In our May 2014 report, we recommended that DOE seek and consider industry input on the amount of DOE sales or transfers of uranium the market can absorb annually and on whether there is a need to reinstitute a guideline that limits annual uranium sales and transfers. DOE disagreed with our findings and recommendations and stated that it has met with industry parties in the past and is open to receiving related information for consideration as it makes future plans. DOE is now taking action consistent with our recommendation because, in December 2014 and March 2015, DOE solicited public input on the potential effects of DOE transfers of excess uranium on the domestic uranium market.

In September 2011, we also identified concerns about market uncertainty resulting from DOE's implementation of its 2008 plan. Specifically, we found that DOE had deviated from the schedule of uranium transfers articulated in its 2008 *Excess Uranium Inventory Management Plan* by allowing more uranium to enter the market sooner than the plan stated.[19] At that time, domestic uranium industry officials we interviewed told us that DOE's departure from its 2008 plan had created anxiety about how

[19]See GAO-11-846.

much further DOE might deviate from its plan in the future. In particular, industry officials were concerned that uncertainties about the quantities of uranium DOE might suddenly decide to sell or transfer could cause uranium prices to fall. Industry officials told us that this fear of declining prices discouraged potential investment in the industry, particularly in newer mining companies seeking to start production.[20] In our September 2011 report, we recommended that DOE update its 2008 *Excess Uranium Inventory Management Plan* to more accurately reflect the department's plans for marketing its uranium. DOE agreed and, in response to our recommendation, released an update to its plan in July 2013. However, as described above, that update may in fact diminish the transparency of DOE's planned future uranium sales and transfers.

DOE Did Not Take Steps to Assess the Technical Quality of Market Impact Studies for Which It Contracted

In May 2014, we found that DOE did not take steps to assess the technical quality of two market impact studies ERI conducted for DOE in 2012 and 2013.[21] DOE uses these market impact studies, in part, to inform the Secretary's statutorily required determinations about whether DOE sales or transfers of uranium will have an adverse material impact on the domestic uranium mining, conversion, or enrichment industries. Specifically, we found that DOE did not take steps outlined in its contracts or in departmental quality assurance guidance to assess the technical quality of these studies. For example, DOE's contract with ERI includes a statement of work providing that, at regular intervals, DOE will formally evaluate the contractor's performance, which evaluation may include the technical quality of the contractor's deliverables, among other things. In

[20]In June 2014, ConverDyn—a U.S. uranium conversion company—filed a lawsuit seeking to stop DOE's uranium transfers, citing concerns about the impact of these uranium transfers on the domestic uranium conversion industry. According to ConverDyn's complaint, it expects to lose more than $10 million per year in potential revenue through 2021 as a result of DOE's uranium transfer activities. This litigation is ongoing.

[21]The April 2012 study projected the potential market effects during calendar years 2012 through 2033 for three DOE uranium transfers: (1) DOE's May 2012 tails transfer for a transaction involving USEC—accounting for about 16 percent of the material studied; (2) ongoing quarterly transfers of natural uranium to contractors in exchange for environmental cleanup services at a uranium enrichment plant—accounting for 72 percent of the material studied; and (3) transfers of downblended highly enriched uranium—accounting for 12 percent of the material studied. The January 2013 study projected the market impact during calendar year 2013 for one transaction: DOE's March 2013 transfer of the enrichment services component of enriched uranium to USEC. See GAO-14-291 for additional details about the two transactions involving USEC.

addition, DOE's *Information Quality Guidelines* set forth quality assurance steps and procedures to ensure the technical quality of information that DOE makes publicly available.[22] The ERI studies were published on DOE's website, but DOE officials told us that they neither conducted an assessment of the technical quality of the studies nor requested any additional information from ERI about the studies. According to DOE officials, they did not examine the studies' methodology or assess the studies' technical quality because they wanted ERI's studies to be independent and did not want to influence their results. DOE officials told us that they contracted with ERI to provide subject matter expertise that did not exist within DOE and trusted ERI to provide that expertise. However, if DOE did not have the internal subject matter expertise to review the studies, another tool available to the department—specifically discussed in DOE's *Information Quality Guidelines*—is peer review, which is generally defined as the process of having independent experts assess the technical and scientific merit of studies. Nonetheless, ERI's principal author told us that the two studies were not peer-reviewed by a third party.

In our May 2014 report, we also found that ERI's studies provided limited detail about their methodology, data sources, and assumptions, even though DOE's *Information Quality Guidelines* direct such information to be included in publicly disseminated documents.[23] For example, ERI did not provide information about the sources of data it used to develop its market supply curves, which were fundamental to its market analysis. We also identified shortcomings in the studies that raise questions about their conclusions, which DOE used to inform the Secretary of Energy's statutory determinations that its uranium transfers would not have an adverse material impact on the domestic uranium market. For example, we identified concerns about ERI's assumption that DOE's planned uranium transfers would not have a cumulative effect on the term

[22]These guidelines—developed by DOE as required by the Information Quality Act and under associated guidelines issued by the Office of Management and Budget—set forth quality assurance steps and procedures to ensure the quality and objectivity of information that DOE makes publicly available. The guidelines state that DOE should seek to ensure that information disseminated to the public meets a basic level of quality, which is measured by the objectivity of the information and whether the information is accurate, clear, complete, and reliable. Consolidated Appropriations Act, 2001, Pub. L. No. 106-554 Title V § 515 (a), 114 Stat. 2763A-153 to 2763A-154 (2000) (commonly referred to as the Information Quality Act).

[23]See GAO-14-291.

market.[24] Similarly, in September 2011, we also identified concerns with the results of two market impact analyses ERI conducted for DOE in November 2009 and December 2010 because of issues related to the economic model developed by ERI.[25]

In our May 2014 report, to ensure the quality, credibility, and transparency of any future uranium market impact studies, we recommended that DOE (1) conduct assessments of the quality of its future market impact studies consistent with DOE's *Information Quality Guidelines* or have an independent third party conduct a peer review and (2) require that the studies include information on the methods, data sources, and assumptions used consistent with DOE's *Information Quality Guidelines*.[26] DOE neither agreed nor disagreed with this recommendation and stated that it would continue to consider the applicability of its *Information Quality Guidelines* to independent analyses of the potential market impact of the proposed transactions and take appropriate steps if applicable. DOE did not comment on the second part of our recommendation to include information on the methods, data sources, and assumptions in its studies. We continue to believe that DOE should require that its future studies contain such information to ensure their quality, credibility, and transparency.[27]

[24]Specifically, we identified several concerns with the certainty of ERI's conclusions regarding the effect of DOE's uranium transfers on the term and spot markets, including (1) the completeness of the data ERI used to develop the market supply curves, which were fundamental to its term market analysis; (2) ERI's assumption that DOE's planned uranium transfers would not have a cumulative effect on the term market; and (3) ERI's model that it developed for its analysis of the spot market, which accounts for some, but not all, factors that can affect spot market prices. See GAO-14-291 for our analysis of ERI's market impact studies and discussion of these concerns.

[25]See GAO-11-846.

[26]See GAO-14-291.

[27]In April 2014, ERI released a report assessing additional proposed DOE transfers. In that assessment, ERI does not make any conclusion about whether or not the release of DOE inventories into the commercial markets will result in an adverse material impact. Instead, ERI notes that, in accordance with the USEC Privatization Act, any determination of adverse material impact is made by the Secretary of Energy.

DOE's Uranium Transfers Have, in Some Cases, Violated Federal Law

Since 2006, we have reported on legal concerns with a number of transfers or potential transfers of uranium.[28] In May 2014, we identified legal concerns with four DOE uranium transactions conducted from 2012 through 2013.[29] For a March 2013 transaction, for example, we found that DOE transferred ownership of uranium previously obtained for national security purposes without obtaining the required presidential determination that the uranium material was no longer necessary for national security purposes.[30] For another transaction, in May 2012, we found that DOE likely lacked authority to transfer tails because of specific prohibitions imposed by the USEC Privatization Act.[31] As we explained in our May 2014 report—and had explained in our 2008 report when we addressed the same legal issue[32]—section 3112 of the USEC Privatization Act prohibits DOE from selling or transferring "any uranium" to "any person" except in a manner consistent with the act. Because the act specifies no conditions for the sale or transfer of depleted uranium tails, in contrast to the act's conditions for other types of uranium, statutory construction rules indicate DOE likely lacks authority to sell or transfer depleted uranium. DOE disagreed with this conclusion, citing its general authority under the Atomic Energy Act to distribute source material.[33] Even if that general authority applied to the transfer of depleted uranium, however, we found that DOE did not meet the Atomic Energy Act's requirement to charge a price for the tails because it transferred them without charging any price at all.

To ensure the same type of scrutiny that Congress has required for sale or transfer of DOE's other valuable federal uranium assets—such as

[28]See GAO-14-291, GAO-11-846, GAO-08-606R, and B-307137.

[29]See GAO-14-291.

[30]See GAO-14-291.

[31]USEC Privatization Act § 3112, codified as amended at 42 U.S.C. § 2297h-10.

[32]See GAO-08-606R.

[33]DOE said its position is "consistent with" section 3112's broad prohibition because Congress included no conditions authorizing the sale or transfer of depleted uranium. This only reinforces GAO's interpretation. Congress imposed conditions on DOE's sale of all valuable uranium; because depleted uranium was not valuable in 1996, Congress did not need to address its sale or transfer and instead addressed its disposal in section 3113. When depleted uranium later became valuable, its sale or transfer remained prohibited unless and until Congress sets conditions to ensure appropriate management of this federal asset. See GAO-14-291 and GAO-08-606R.

price, protection of the domestic uranium industry, and safeguarding the national security—we suggested that Congress consider clarifying DOE's authority to manage depleted uranium and provide explicit direction about whether and how DOE may sell or transfer it.[34] Legislation has been introduced that would authorize DOE to sell or transfer depleted uranium subject to certain conditions but, as of March 2015, Congress has not passed legislation to clarify or enhance DOE's authority.[35]

In our May 2014 report, we recommended that for each uranium transaction it conducts, DOE should publicly identify the legal authority it relies on and explain how the transaction meets the requirements of that authority. DOE disagreed with this recommendation and stated that it would not publicly report the authorities it relies on because it is not legally required to do this and because citing the law would disclose information "traditionally…protected as attorney work product or privileged pre-decisional documents." Reporting DOE's final decision on which law it has relied on for its transactions would breach no privilege, however, and we maintain that reporting this to Congress and the public would improve transparency. After we issued our report, Congress took action in the Consolidated and Further Continuing Appropriations Act, 2015, to require what we had recommended: that DOE report to the Committees on Appropriations the provisions of law under which it conducts uranium transactions not less than 30 days prior to conducting the transaction.[36]

In July 2006[37] and September 2011,[38] we reported on a different legal concern, finding that certain of DOE's uranium transfers were sales authorized by the USEC Privatization Act but that DOE violated federal fiscal law in how it handled proceeds from these transfers. Specifically, the miscellaneous receipts statute requires an official or agent of the government receiving money from any source on the government's behalf to deposit the money into the Treasury.[39] We found that DOE provided

[34]See GAO-12-342SP and GAO-08-606R.

[35]SAVE Act, H.R. 614, 114th Cong. § 114 (2015).

[36]Pub. L. No. 113-235, div. D tit. III, § 306(b) (2014).

[37]See B-307137.

[38]See GAO-11-846.

[39]Miscellaneous receipts statute, 31 U.S.C. § 3302(b) (2015).

uranium to USEC for sale to a third party and allowed USEC to keep the proceeds of the sales as payment for services rendered to DOE, but DOE did not deposit the value of the net proceeds from these uranium sales into the Treasury. Even with no money changing hands, we concluded that an amount equivalent to the value that went to USEC should have gone to the Treasury. While our 2011 report noted that the transactions we analyzed in 2011 differed in some superficial respects from the transactions we analyzed in 2006, we found the core substance was the same and, as DOE officials told us in 2011, the department intentionally structured the disposition of federal assets to avoid payment of the proceeds for those assets into the Treasury. Our September 2011 report suggested that Congress consider providing DOE with explicit authority to barter excess uranium and to retain the proceeds from bartering, transferring, and selling uranium but, as of March 2015, Congress had not passed legislation giving DOE this authority.

DOE May Not Be Effectively Stewarding Its Uranium Resources

In our May 2014 report, we found that DOE did not have consistent methods for valuing depleted uranium tails.[40] As discussed above, we found that DOE likely lacks authority to sell such material but noted that if DOE sells it, nonetheless, it should seek to maximize the value received by the government in any such transaction.[41] Specifically, we found that DOE did not have guidance for determining the value of tails when they are treated as an asset in a transaction and, as a result, DOE estimated the tails it transferred for re-enrichment in a 2012 transfer had a potential value ranging from $0 to $300 million. For this 2012 transaction, DOE decided that the tails it transferred had no value because tails are typically considered to be an environmental liability and, therefore, the transaction had no cost to the department. However, because the tails were re-enriched and used in lieu of natural uranium, we found that the tails were an asset in the context of this transaction and, therefore, should have had some value. Moreover, in other cases, DOE has determined

[40]See GAO-14-291.

[41]Even if DOE has authority to transfer tails, the 2008 *Secretary of Energy's Policy Statement on Management of the Department of Energy's Excess Uranium Inventory* required DOE to ensure that the department receives reasonable value in return for transferred uranium. In addition, the Atomic Energy Act requires DOE to establish a nondiscriminatory price for uranium that would provide reasonable compensation to the government. Further, the USEC Privatization Act requires DOE to obtain fair market value for transferred uranium.

that tails do have value. For example, in November 2013, DOE announced that it would begin negotiations with GE-Hitachi's Global Laser Enrichment about selling part of DOE's inventory of tails. The fact that DOE received commercial interest in its tails underscores the point that tails can be viewed as an asset. Previously, in a DOE 2005 transfer of tails to Energy Northwest—a membership organization of public utilities in the northwestern United States—DOE charged a price for its tails. Without consistent guidance for how to value its tails in the context of transactions that treat them as an asset, DOE cannot ensure the government is reasonably compensated for its uranium transfers.

Therefore, in May 2014, we recommended that DOE develop guidance for consistently determining the value of depleted uranium tails when transferring them as an asset. DOE disagreed with this recommendation and stated that it is not required to establish guidance or a pricing policy for depleted uranium and to do so would hinder DOE's ability to maximize the value received by the government in a given transaction. However, we continue to believe that, because DOE may sell or transfer additional tails in the near future, having guidance that provides a consistent and transparent method for determining the value of tails in the context of a transaction is necessary.

Having guidance that provides a consistent and transparent method for determining the value of tails is particularly important when uranium prices are volatile. In March 2008, we reported that uranium prices are very volatile, and a sharp rise or fall in prices could greatly affect the value of DOE's tails inventory.[42] At the time of that report, we concluded that the dramatic increases in uranium prices in 2008 had presented the U.S. government with an opportunity to gain potentially billions of dollars from depleted uranium tails material that was once considered a liability.[43] However, since then, global market prices for uranium have declined

[42]See GAO-08-606R.

[43]While we concluded that DOE's authority to sell depleted uranium tails was doubtful, we found that DOE generally has authority to re-enrich and then sell the tails.

steeply.[44] This raises questions as to whether DOE's plan for its excess uranium management considers the timing of its potential uranium transfers with market conditions to maximize the value of uranium for the government.

In conclusion, DOE requires uranium for national security purposes, and DOE's inventory of uranium represents a valuable and important asset that the government must effectively and responsibly manage. Over nearly a decade, we have made numerous recommendations in our reports to address issues related to the management of excess uranium. In our most recent 2014 report, DOE generally disagreed with our recommendations to improve the transparency of its uranium transfers. However, DOE has taken some recent steps that are consistent with the intent of one of our recommendations. For example, in a notice published in the *Federal Register* in December 2014, in anticipation of a new secretarial determination covering future transfers of uranium, DOE solicited public input on the potential effects of DOE transfers of excess uranium on the domestic uranium mining, conversion, and enrichment industries and on methodologies to assess the market impact of these transfers.[45] Similarly, in a *Federal Register* notice in March 2015, DOE summarized the responses it received regarding the December 2014 notice and the list of factors DOE has identified for analysis of the potential effects of DOE transfers on the uranium mining, conversion, and

[44]In March 2011, a tsunami caused by a major earthquake off the coast of Japan resulted in irreparable damage to four nuclear reactors at the Fukushima Daiichi power plant. The accident has led to a review of civilian nuclear power programs worldwide, affecting the global market for uranium enrichment services and resulting in significant downward pressure on market prices for low-enriched uranium. For example, in the wake of the accident, the Japanese government directed that all but 2 of Japan's 50 civilian nuclear power reactors be shut down pending a complete safety review and, as of March 2014, all reactors had been shut down. In March 2014, we reported that it was uncertain when these reactors will be brought back online. In addition, Germany accelerated the shutdown of its nuclear power reactors. Specifically, on June 30, 2011, after the Fukushima Daiichi accident, the German parliament voted to fully shut down its nuclear power plants by the end of 2022. This vote followed the suspension of operations of 8 of Germany's 17 nuclear power plants. See GAO, *Nuclear Safety: Countries' Regulatory Bodies Have Made Changes in Response to the Fukushima Daiichi Accident*, GAO-14-109 (Washington, D.C.: Mar. 6, 2014).

[45]Excess Uranium Management: Effects of DOE Transfers of Excess Uranium on Domestic Uranium Mining, Conversion, and Enrichment Industries; Request for Information, 79 Fed. Reg. 72,661 (Dec. 8, 2014).

enrichment industries.[46] We will continue to monitor DOE's actions that may address our recommendations and any other steps the department takes to improve the transparency of its uranium transactions.

Chairman Lummis, Ranking Member Lawrence, and Members of the Subcommittee, this completes my prepared statement. I would be pleased to respond to any questions that you may have at this time.

GAO Contact and Staff Acknowledgments

If you or your staff members have any questions about this testimony, please contact me at (202) 512-3841 or trimbled@gao.gov. Contact points for our Offices of Congressional Relations and Public Affairs may be found on the last page of this statement. GAO staff who made key contributions to this testimony are Susan D. Sawtelle, Managing Associate General Counsel; Allison B. Bawden, Assistant Director; Eric Bachhuber, Antoinette Capaccio, Karen K. Keegan, Amanda K. Kolling, Mehrzad Nadji, Rebecca Shea, and Karen Villafana.

[46]Excess Uranium Management: Effects of DOE Transfers of Excess Uranium on Domestic Uranium Mining, Conversion, and Enrichment Industries; Notice of Issues for Public Comment, 80 Fed. Reg. 14,107 (Mar. 18, 2015).

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Biography

David Trimble serves as a Director in the U.S. Government Accountability Office's Natural Resources & Environment group in Washington DC. Mr. Trimble provides leadership and oversight on US and International Nuclear Security and Cleanup issues. He previously led work on environmental issues including clean water and clean air issues, controlling toxic substances, Superfund and EPA management.

Mr. Trimble rejoined the U.S. Government Accountability Office in April 2009. Previously Mr. Trimble worked for nine years at the Department of State's Political Military Affairs Bureau as the Director of the Office of Defense Trade Controls Compliance where he was the senior official responsible for export compliance and enforcement issues. From 1986 to 2000, Mr. Trimble worked for the GAO in field offices as well as GAO Headquarters covering a wide range of issues. He holds an MA in Policy Analysis from the University of Chicago and a BA in Philosophy from Lawrence University.