



Testimony  
Before the Committee on Environment  
and Public Works, U.S. Senate

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DEPARTMENT OF  
ENERGY

Excess Uranium Transfers

Statement of Allison Bawden, Acting Director, Natural  
Resources and Environment

Accessible Version

# GAO Highlights

Highlights of [GAO-17-472T](#), a testimony before the Committee on Environment and Public Works, U.S. Senate

## Why GAO Did This Study

DOE maintains an inventory of uranium, including depleted uranium “tails” resulting from the uranium enrichment process, and periodically sells or transfers 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, DOE must determine that sales or transfers of uranium will not have an adverse material impact on the domestic uranium market, among other things.

This testimony highlights issues found in nine GAO products from July 2006 through September 2015 related to DOE’s transfers of excess uranium. It focuses on (1) steps DOE has taken to assess the technical quality of contracted market impact studies, (2) whether DOE has developed guidance for valuing its uranium resources, and (3) whether DOE’s uranium transfers have violated federal law. GAO reviewed relevant laws; documents, including transaction documents and contracts; and interviewed DOE, contractor, uranium industry representatives, and uranium market analysts.

Over nearly a decade, GAO has made numerous recommendations to improve DOE’s transfers of excess uranium. DOE has neither agreed nor disagreed on some recommendations and has disagreed with others. GAO will continue to monitor DOE’s implementation of these recommendations.

View [GAO-17-472T](#). For more information, contact Allison Bawden at (202) 512-3841 or [bawdena@gao.gov](mailto:bawdena@gao.gov).

March 8, 2017

## DEPARTMENT OF ENERGY

### Excess Uranium Transfers

## What GAO Found

GAO has raised several issues related to the Department of Energy’s (DOE) excess uranium transfers in five reports, three testimonies, and a legal opinion issued from 2006 to 2015 as follows:

- DOE did not take steps to assess the technical quality of market impact studies conducted in April 2012 and January 2013. In part to ensure that its uranium transfers would 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. These studies concluded that these transfers would not result in adverse market impacts. In its May 2014 report, GAO reviewed these studies and found issues with their analyses. For example, 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. GAO also found 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. DOE officials stated that they did not examine the studies’ methodology or assess the studies’ technical quality because they wanted the studies to be independent, and they trusted the contractor to provide subject matter expertise that did not exist within DOE. GAO recommended that DOE take steps to evaluate the technical quality of the market studies for which it contracts. DOE neither agreed nor disagreed with this recommendation.
- DOE has not developed guidance for valuing its depleted uranium tails—which historically have 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. In May 2014, GAO 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 for depleted uranium, and reiterated this position in August 2016. However, since that time, DOE has continued to receive commercial interest in its tails, underscoring that tails can be viewed as an asset. GAO continues to believe that having guidance that provides a consistent and transparent method for determining the value of tails is necessary to ensure that DOE is reasonably compensated for its material.
- DOE’s uranium transfers have, in some cases, violated federal law. In May 2014, GAO concluded that DOE likely did not have authority to transfer tails because of prohibitions imposed by the USEC Privatization Act. That law prohibits DOE from selling or transferring “any uranium” to “any person” except in a manner consistent with the act. DOE disagreed with this conclusion, citing its general authority under the Atomic Energy Act to distribute source material. GAO 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. Legislation introduced in the 114th Congress would have authorized DOE to transfer tails but it was not passed.

Chairman Barrasso, Ranking Member Carper, and Members of the Committee:

Thank you for the opportunity to discuss our work on the Department of Energy's (DOE) transfers of excess uranium.<sup>1</sup> For more than 50 years, the federal government enriched uranium.<sup>2</sup> These decades of federal uranium enrichment activities, and other sources, generated an extensive uranium inventory that DOE maintains.<sup>3</sup> DOE periodically sells or transfers excess uranium from its inventory—material that has been deemed excess to national security missions—to achieve other DOE missions. For example, DOE sells or transfers its excess uranium to fund environmental cleanup of a shuttered uranium enrichment plant in Portsmouth, Ohio.<sup>4</sup> This activity is also supported using annual appropriations.

Sales or transfers of uranium by DOE have the potential to adversely impact the domestic uranium industry. DOE's sales and transfers of uranium are subject to certain conditions under the Atomic Energy Act of 1954, as amended by the USEC Privatization Act, including a required determination by the Secretary of Energy that the transfer will not have an adverse material impact on the domestic uranium market.<sup>5</sup> To help inform

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<sup>1</sup>We define uranium transfers as the exchange of natural, enriched, or depleted uranium "tails," or uranium enrichment services between DOE and another party.

<sup>2</sup>Uranium enrichment involves 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.

<sup>3</sup>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. Pub. L. No. 104-134, 110 Stat. 1321, 1321-335 (1996) (codified as amended at 42 U.S.C. §§ 2297h-2297h-13 (2017)).

<sup>4</sup>For this activity, DOE transfers uranium from its inventory as payment for cleanup services provided by a contractor at Portsmouth.

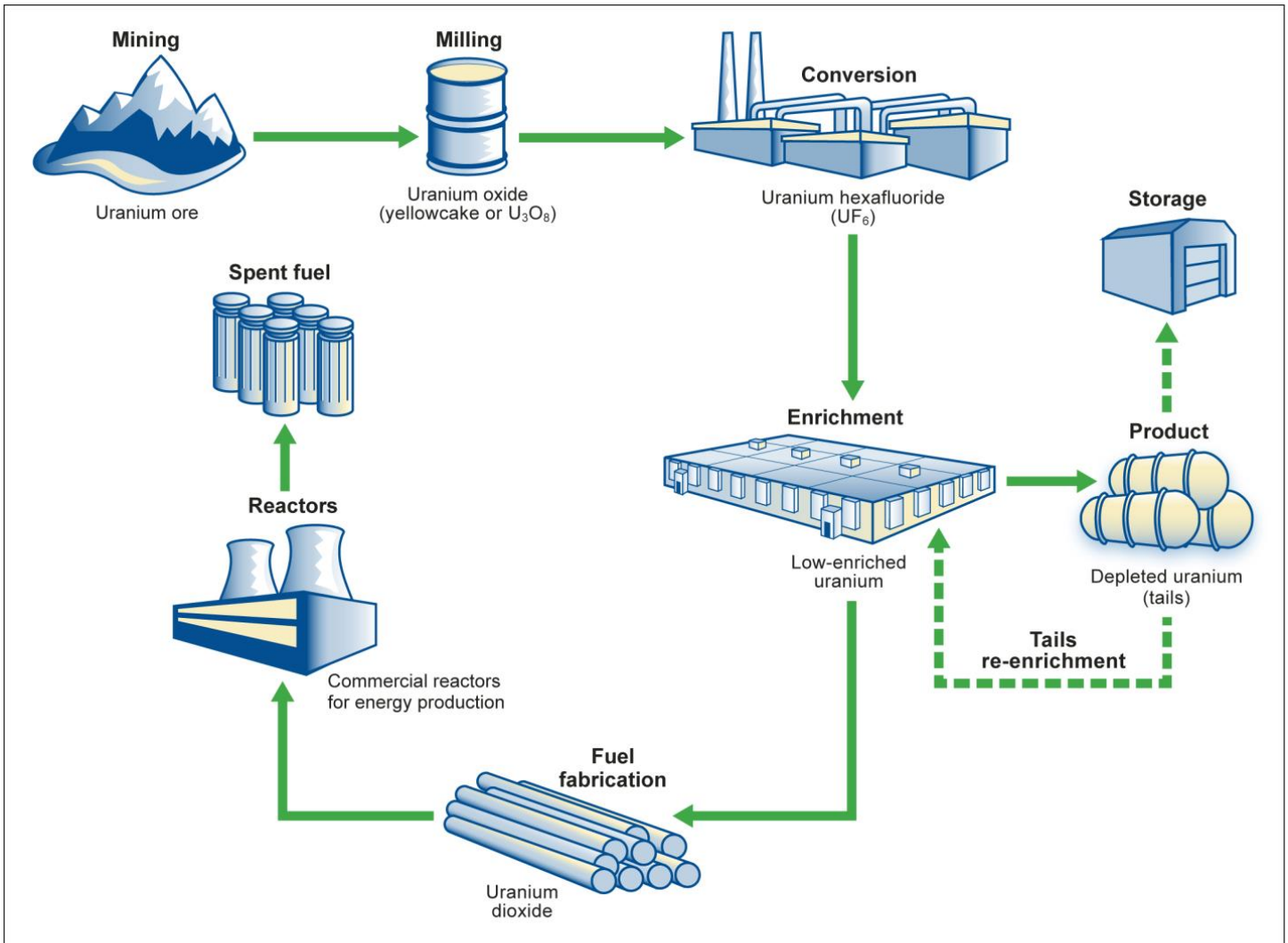
<sup>5</sup>See 42 U.S.C. §§ 2073, 2093, § 2297h-10 (2017).

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this determination, DOE has contracted with an external consulting firm to assess the market impact of planned uranium transfers.

A portion of DOE's uranium inventory consists of depleted uranium "tails," which have historically been considered waste and treated as an environmental liability; however, under certain economic 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 or when the cost of enrichment services is low (see fig. 1 for an illustration of the nuclear fuel cycle). When DOE transfers tails for re-enrichment, the mining, milling, and conversion stages of the nuclear fuel cycle are bypassed.

**Figure 1: Nuclear Fuel Cycle**



Sources: GAO analysis of International Atomic Energy Agency, Nuclear Regulatory Commission, Congressional Research Service, Department of Energy, and Tennessee Valley Authority documents. GAO-17-472T

**Text for Figure 1: Nuclear Fuel Cycle**

- 1) Mining, Uranium ore
- 2) Milling, Uranium oxide (yellowcake or  $U_3O_8$ )
- 3) Conversion, Uranium hexafluoride ( $UF_6$ )
- 4) Enrichment, Low-enriched uranium

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- a) Product, Depleted uranium (tails) (some flow back to enrichment facility, others go to storage)
  - b) Storage
  - c) Tails re-enrichment
- 5) Fuel fabrication, Uranium dioxide
  - 6) Reactors, Commercial reactors for energy production
  - 7) Spent fuel

Sources: GAO analysis of International Atomic Energy Agency, Nuclear Regulatory Commission, Congressional Research Service, Department of Energy, and Tennessee Valley Authority documents. | GAO-17-472T

In this context, my testimony today highlights our findings from prior work on DOE's management of excess uranium. Specifically, I will address three aspects of DOE's management of uranium about which we have raised issues for nearly a decade: (1) DOE did not take steps to assess the technical quality of contracted market impact studies; (2) DOE has not developed guidance for valuing its uranium resources, particularly tails; and (3) DOE's uranium transfers have in some cases violated federal law. My testimony is based on our five reports, three testimonies, and a legal opinion issued from July 2006 through September 2015.<sup>6</sup> To conduct our prior work, we reviewed relevant laws; documents, including transaction documents and contracts; and interviewed DOE, contractor, uranium industry representatives, and uranium market analysts. Detailed information about the scope and methodology used to conduct this work

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<sup>6</sup>GAO, *Department of Energy: Transactions Involving USEC Inc. Since 1998*, [GAO-15-730](#) (Washington, D.C.: Sept. 10, 2015); GAO, *Department of Energy: Management of Excess Uranium*, [GAO-15-475T](#) (Washington, D.C.: Apr. 22, 2015); 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).

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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.

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## Background

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.<sup>7</sup> 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. DOE has issued several secretarial determinations over the past few years pertaining to its uranium sales and transfers and the impact on the domestic uranium mining, conversion, and enrichment industries.<sup>8</sup> For example, DOE issued a secretarial determination on May 1, 2015, which covers continued transfers of uranium for, among other activities, cleanup services at the Portsmouth plant at rates of up to the equivalent of 2,500 metric tons of

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<sup>7</sup>See 42 U.S.C. § 2297h-10 (2017).

<sup>8</sup>The duration of the secretarial determinations is limited to no more than two calendar years subsequent to the determination. Consolidated and Further Continuing Appropriations Act, 2015, Pub. L. No. 113-235, div. D, tit. III, § 306(a), 128 Stat. 2130, 2324 (2014).

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natural uranium per year in 2015 and up to the equivalent of 2,100 metric tons of uranium (MTU) in each year thereafter.<sup>9</sup>

To help inform the 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.<sup>10</sup> 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 addition, DOE has previously attempted to manage the market impact of its uranium tails transfers by adopting guidance to limit the amount of transfers. For instance, 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. In 2013, DOE announced its decision to discontinue using its 10 percent guideline for limiting uranium sales and transfers and stated that it could meet its statutory and policy objectives without one. In May 2014, we found that DOE officials did not consult with industry representatives before deciding to discontinue using its 10 percent sales and transfer guideline.

The global uranium market entered an extended recession following the Fukushima Daiichi nuclear reactor accident. On March 11, 2011, a magnitude 9.0 earthquake and subsequent tsunami devastated northeastern Japan and severely damaged the Fukushima Daiichi nuclear

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<sup>9</sup>Excess Uranium Management: Secretarial Determination of No Adverse Impact on the Domestic Uranium Mining, Conversion, and Enrichment Industries, 80 Fed. Reg. 26,366, 26,366 (May 7, 2015).

<sup>10</sup>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 Hexafluoride: 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 Hexafluoride (sic): Base Charges, Use Charges, Special Charges, Table of Enriching Services; Specifications, and Packaging: Revisions, 42 Fed. Reg. 51,635 (Sept. 29, 1977).



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power plant. The accident led to a review of civilian nuclear power programs worldwide. For example, following 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.<sup>11</sup> 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 permanently 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. The shutdown of nuclear power reactors has reduced the demand for uranium conversion and enrichment services resulting in an oversupply of enriched uranium and a lower market price.

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## GAO's Prior Work Has Found Issues Related to DOE's Uranium Transfers

In nine products we issued from 2006 to 2015, we have raised several issues related to DOE's excess uranium transfers, including that: (1) DOE did not take steps to assess the technical quality of contracted market impact studies; (2) DOE has not developed guidance for valuing its uranium resources; and (3) DOE's uranium transfers have in some cases violated federal law.

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### 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.<sup>12</sup> These studies concluded that DOE's planned uranium transfers would not result in adverse market impacts. DOE used these market impact studies, in part, to inform the Secretary's statutorily required determinations about whether DOE sales or transfers of uranium would have an adverse material impact on the domestic uranium mining,

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<sup>11</sup>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).

<sup>12</sup>The April 2012 study projected the potential market effects during calendar years 2012 through 2033 for three DOE uranium transfers, and the January 2013 study projected the market impact during calendar year 2013 for one transaction. See [GAO-14-291](#) for additional details.

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conversion, or enrichment industries. However, 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, we found that DOE's contract with ERI included a statement of work providing that, at regular intervals, DOE would formally evaluate the contractor's performance, and that the evaluation could include the technical quality of the contractor's deliverables, among other things. In 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.<sup>13</sup> 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.<sup>14</sup> 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

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<sup>13</sup>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).

<sup>14</sup>See [GAO-14-291](#).

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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 market.<sup>15</sup> 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.<sup>16</sup>

To ensure the quality, credibility, and transparency of any future uranium market impact studies, in our May 2014 report 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*.<sup>17</sup> DOE neither agreed nor disagreed with the first part of 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.<sup>18</sup> However, DOE has taken

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<sup>15</sup>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.

<sup>16</sup>See [GAO-11-846](#).

<sup>17</sup>See [GAO-14-291](#).

<sup>18</sup>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.

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some steps that are consistent with the intent of these recommendations. For example, in notices published in the *Federal Register* in December 2014 and July 2016, in anticipation of new secretarial determinations 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.<sup>19</sup>

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## DOE Does Not Have Guidance for Valuing Its Uranium Tails

In our May 2014 report, we found that DOE did not have guidance for valuing depleted uranium tails.<sup>20</sup> 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 that tails do have value. For example, in a DOE 2005 transfer of tails, DOE charged a price for its tails. We concluded that without 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.

Having guidance that provides a consistent and transparent method for determining the value of tails is particularly important because—as we reported in March 2008—uranium prices are very volatile, and a sharp rise or fall in prices could greatly affect the value of DOE’s tails inventory

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<sup>19</sup>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); Excess Uranium Management: Effects of DOE Transfers of Excess Uranium on Domestic Uranium Mining, Conversion, and Enrichment Industries; Request for Information, 81 Fed. Reg. 46,917 (July 19, 2016).

<sup>20</sup>See [GAO-14-291](#). As will be discussed in more detail below, DOE likely does not have authority to sell depleted uranium tails, but if DOE does sell it, DOE policy requires DOE to ensure that the department receives reasonable value in return for transferred uranium.

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depending on when transfers occur.<sup>21</sup> 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.<sup>22</sup> In June 2011, GAO reported that DOE's depleted uranium tails inventory had a net value of \$4.2 billion. However, since 2011, the market prices for uranium have decreased, and the composition of DOE's tails inventory has changed in part because of transfers, thereby lowering the value of DOE's remaining inventory. In 2014, as part of technical assistance provided to Congress, GAO calculated the June 2014 value of DOE's inventory at then-current uranium prices using a model developed by uranium experts at a DOE site and found that the estimated value of DOE's tails inventory was about \$1 billion.

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 was 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. In August 2016, DOE reiterated this position and stated that the department's response is unchanged and no actions have been taken that are specific to this recommendation. Since that time, DOE has continued to receive commercial interest in its uranium tails, underscoring that the tails can be viewed as an asset. For example, in November 2016, DOE announced that it had agreed with GE-Hitachi's Global Laser Enrichment (GLE) to sell depleted uranium for re-enrichment over a 40-year period.<sup>23</sup> According to the licensor of the GLE technology, the agreement facilitates the sale of approximately 300,000 tons of depleted uranium. The tails would be enriched at a proposed facility to be built in the early 2020s in Paducah, Kentucky, next to the shuttered Paducah

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<sup>21</sup>See [GAO-08-606R](#).

<sup>22</sup>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.

<sup>23</sup>According to DOE officials, as of June 2014, DOE maintained approximately 525,000 metric tons of uranium in the form of depleted uranium tails.

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uranium enrichment plant.<sup>24</sup> Therefore, we continue to believe that having guidance that provides a consistent and transparent method for determining the value of tails in the context of a transaction is necessary.

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## 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.<sup>25</sup> In May 2014, we identified legal concerns with four DOE uranium transactions conducted from 2012 through 2013.<sup>26</sup> In 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.<sup>27</sup> For another transaction, in May 2012, we found that DOE likely did not have authority to transfer tails because of specific prohibitions imposed by the USEC Privatization Act.<sup>28</sup> As we explained in our May 2014 report—and had explained in our 2008 report when we addressed the same legal issue<sup>29</sup>—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 does not have authority to sell or transfer depleted uranium. DOE disagreed with this conclusion, citing its general authority under the Atomic Energy Act to distribute

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<sup>24</sup>The 2016 announcement followed a Request for Offers in July 2013 regarding its remaining inventories of tails. The Request for Offers specified that natural uranium created from the tails could not enter the market before 2019 and would have to be limited to 2,000 MTU natural uranium equivalent per year. See DOE Portsmouth/Paducah Project Office, Request for Offers for the Sale of Depleted and Off-Specification Uranium Hexafluoride Inventories, Request for Offers Number: DE-SOL0005845, July 3, 2013.

<sup>25</sup>See [GAO-14-291](#), [GAO-11-846](#), [GAO-08-606R](#), and [B-307137](#).

<sup>26</sup>See [GAO-14-291](#).

<sup>27</sup>See [GAO-14-291](#).

<sup>28</sup>42 U.S.C. § 2297h-10 (2017).

<sup>29</sup>See [GAO-08-606R](#).

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source material.<sup>30</sup> 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 the sale or transfer of DOE's other valuable federal uranium assets—such as price, protection of the domestic uranium industry, and safeguarding the national security—in March 2008 and September 2011, 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.<sup>31</sup> Legislation introduced in the 114th Congress would have authorized DOE to sell or transfer depleted uranium tails subject to certain conditions but was not passed.<sup>32</sup>

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

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<sup>30</sup>DOE stated that 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](#).

<sup>31</sup>See [GAO-11-846](#) and [GAO-08-606R](#).

<sup>32</sup>SAVE Act, H.R. 614, 114th Cong. § 114 (2015); Excess Uranium Transparency and Accountability Act, H.R. 2544, 114<sup>th</sup> Cong. (2015); Excess Uranium Transparency and Accountability Act, S. 1428, 114<sup>th</sup> Cong. (2015).

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conducts uranium transactions not less than 30 days prior to conducting the transaction.<sup>33</sup>

In July 2006<sup>34</sup> and September 2011,<sup>35</sup> we reported on a different legal concern, finding that certain DOE 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.<sup>36</sup> We found that DOE provided uranium to a company for sale to a third party and allowed the company 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 the company 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. Legislation introduced in the 114th Congress would have authorized DOE to barter uranium but it was not passed.<sup>37</sup>

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

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<sup>33</sup>Pub. L. No. 113-235, div. D tit. III, § 306(b) (2014).

<sup>34</sup>See [B-307137](#).

<sup>35</sup>See [GAO-11-846](#).

<sup>36</sup>Miscellaneous receipts statute, 31 U.S.C. § 3302(b) (2017).

<sup>37</sup>Excess Uranium Transparency and Accountability Act, H.R. 2544, 114<sup>th</sup> Cong. (2015); Excess Uranium Transparency and Accountability Act, S. 1428, 114<sup>th</sup> Cong. (2015).



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## 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 [bawdena@gao.gov](mailto:bawdena@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 William Hoehn, Assistant Director; Eric Bachhuber, Antoinette Capaccio, Julia Coulter, Amanda K. Kolling, Katrina Pekar-Carpenter, and Steven Putansu.

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