



Report to the Ranking Member,
Subcommittee on Water Resources
and Environment, Committee on
Transportation and Infrastructure,
House of Representatives

April 2014

ARMY CORPS OF ENGINEERS

Actions Needed to Further Improve Management of Hopper Dredging

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Why GAO Did This Study

The Corps is responsible for dredging sediment from waterways to maintain shipping routes important for commerce. One dredge type, a hopper dredge, performs much of the dredging in ports and harbors, and the Corps uses its own fleet of hopper dredges and contracts with industry to carry out the work. In 2003, GAO examined the Corps' hopper dredging program and made recommendations to improve its management. GAO was asked to review changes to the program.

This report examines (1) actions the Corps has taken to address GAO's 2003 recommendations for improving the information needed to manage its hopper dredging program and develop cost estimates for industry contracts; (2) effects since 2003, if any, of the statutory restrictions placed on the use of the Corps' hopper dredges; and (3) key challenges, if any, the Corps faces in managing its hopper dredge fleet. GAO reviewed laws, regulations, and policies governing the Corps' use of hopper dredges, and related Corps reports. GAO analyzed dredging contract and financial data for fiscal years 2003-2012, assessed the reliability of these data, and interviewed Corps and dredging stakeholders.

What GAO Recommends

GAO recommends the Corps provide written direction to its district offices on consistently populating its database with no-bid and high-bid solicitations and develop a written plan for a study to obtain and periodically update certain hopper dredging cost data for its cost estimates. The Department of Defense concurred with the recommendations.

View [GAO-14-290](#). For more information, contact Anne-Marie Fennell at (202) 512-3841 or fennella@gao.gov.

ARMY CORPS OF ENGINEERS

Actions Needed to Further Improve Management of Hopper Dredging

What GAO Found

The U.S. Army Corps of Engineers (Corps) has taken actions to address GAO's 2003 recommendations for improving information related to hopper dredging, but some data gaps remain. First, in response to GAO's recommendation to obtain and analyze data needed to determine the appropriate use of its hopper dredge fleet, the Corps established a tracking log to document urgent or emergency work its dredges carry out. The Corps also modified its dredging database to track solicitations for industry contracts that received no bids and bids exceeding the Corps' cost estimate by more than 25 percent, referred to as high bids. Corps district offices, however, do not consistently enter data on these solicitations, and Corps headquarters has not provided written direction to the district offices to ensure data are consistently entered. Tracking and analyzing no-bid and high-bid solicitation data could enable the Corps to identify and address gaps in industry's ability to fulfill certain dredging needs as the Corps plans its future hopper dredging work. Second, in response to GAO's recommendation, the Corps took action to assess the data and procedures it used for developing cost estimates when soliciting industry contracts. However, certain industry cost data the Corps relies on remain outdated. For example, some of the data it uses on hopper dredge equipment date back to the late 1980s. A senior Corps official stated that a study could be conducted to update the data, but the Corps has no plans to conduct such a study. Having a plan for obtaining updated data is important for developing sound cost estimates.

Statutory restrictions on the use of the Corps' hopper dredges since 2003 have resulted in costs to the Corps, but the effect on competition in the hopper dredging industry is unclear. Restrictions limiting the number of days that Corps dredges can work have resulted in additional costs such as costs to maintain certain Corps dredges while they are idle; the Corps incurs many of the costs for owning and operating its hopper dredges regardless of how much they are used. The restrictions, however, help ensure the Corps has the ability to use these dredges to respond to urgent or emergency dredging needs when industry dredges are unavailable. It is not clear to what extent restrictions have affected competition in the dredging industry. The number of U.S. companies with hopper dredges has not changed, but the number and size of these dredges have decreased since 2003. In addition, GAO did not find evidence of increased competition based on the number of bidders and winning bid prices for Corps hopper dredging projects since 2003.

Key challenges facing the Corps in managing its hopper dredge fleet are (1) ensuring the fiscal sustainability of its hopper dredges and (2) determining the fleet's appropriate future composition. In 2012, the Corps determined that because of increasing ownership and operating costs, among other things, its hopper dredges would become unaffordable unless actions were taken, including increasing the daily rates charged to projects using the Corps' dredges. Factors such as the aging of the Corps' fleet and the effect on industry of possible changes to the Corps' fleet make it difficult for the Corps to determine the best fleet composition. In studies it conducted in 2011 and 2012, the Corps identified actions that could help address these challenges, such as reviewing the operating costs of hopper dredges to evaluate the affordability of certain dredges.

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Abbreviations

DCA Dredging Contractors of America

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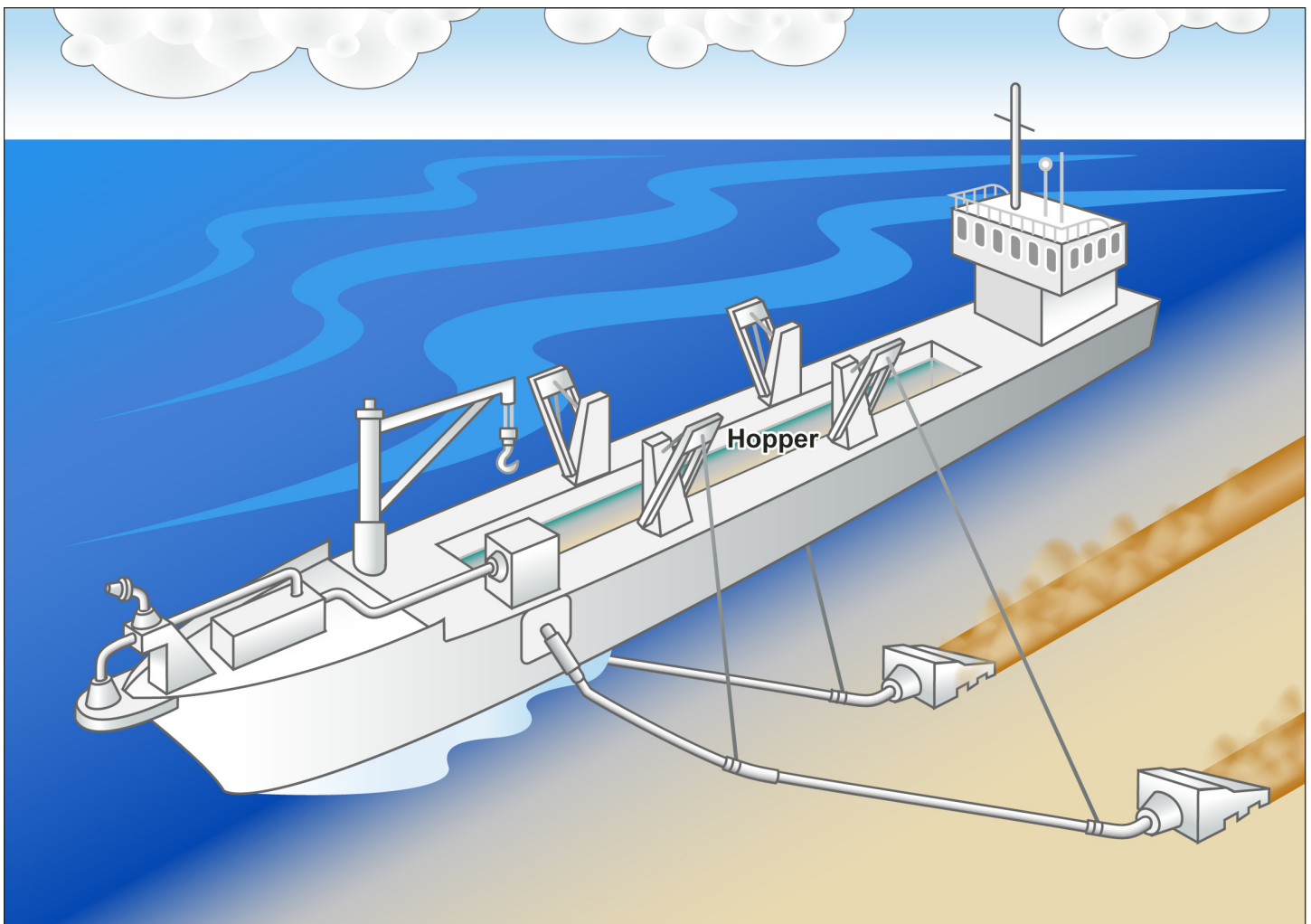
April 10, 2014

The Honorable Timothy H. Bishop
Ranking Member
Subcommittee on Water Resources and Environment
Committee on Transportation and Infrastructure
House of Representatives

Dear Mr. Bishop:

Maintaining the nation's navigation channels and ports is vital to U.S. commerce, with nearly \$1.8 trillion of import and export cargo passing through the nation's waterways in 2012. The U.S. Army Corps of Engineers (Corps) is responsible for dredging—that is, removing sediment from the bottom of—ports, harbors, and other U.S. waterways to facilitate their navigation. Vessels called dredges are used to remove sediment in order to maintain navigation channels at the depths and widths necessary for shipping. Various types of dredging vessels exist, each designed to perform in certain conditions or locations. One type—the hopper dredge—performs much of the dredging work in ports, harbors, and other waterways exposed to the ocean, where shipping traffic and operating conditions render the use of other types of dredges inefficient, impractical, or unsafe. A hopper dredge vacuums material (e.g., a mixture of sediment and water) into its “hopper” or containment area, where the material is stored before being transported to a placement site (see fig. 1). In fiscal year 2012, the Corps spent about \$370 million for hopper dredging, removing nearly 72 million cubic yards of material from dozens of ports and harbors across the country.

Figure 1: Illustration of a Hopper Dredge



Source: GAO.

The Corps carries out hopper dredging using a combination of its own fleet of dredging vessels and industry vessels operating under contract, and it is required to do so in the manner most economical and advantageous to the United States. Until 1978, the Corps performed all hopper dredging in the United States with its fleet of 14 hopper dredges. In 1978, legislation directed the Corps to (1) contract out much of its dredging work to private industry as industry demonstrated that it could perform the work at reasonable prices and in a timely manner, (2) reduce

the federal hopper fleet as industry demonstrated its ability to perform, and (3) maintain a minimum fleet of federal vessels.¹ Specifically, the legislation directed the Corps to retain as much of its fleet as it determined necessary to ensure that the federal and private industry fleets together could carry out necessary dredging projects. According to the Corps, the purpose of the minimum fleet is to diminish risks to navigation by performing urgent, emergency, or national defense work, or to respond when industry either does not submit a reasonable bid for dredging solicitations or does not perform adequately under an existing contract.² Over time, the Corps has reduced the size of its hopper fleet to four vessels: the *Essayons*, *McFarland*, *Wheeler*, and *Yaquina*. Generally, Corps district offices, in coordination with Corps division offices to which the district offices report, are responsible for managing and contracting for the dredging that occurs within their districts, under the guidance of Corps headquarters.

Beginning in 1993, Congress began imposing various statutory restrictions on the operations of certain Corps hopper dredges. For example, restrictions imposed by the Water Resources Development Act of 1996 effectively (1) reduced the annual authorized work schedule of the *Essayons*, *McFarland*, and *Yaquina* and (2) limited the number of days the *Wheeler* could be used annually by taking it out of active status and placing it in “ready reserve”—under which the Corps uses it primarily for training purposes and calls it into active status only in limited circumstances, such as urgent and emergency work.³ According to a House committee report, the restrictions were intended to further encourage the Corps to contract with private industry for hopper dredging.⁴ Over a decade later, Congress passed the Water Resources Development Act of 2007, which required that the Corps place the

¹Pub. L. No. 95-269 (1978).

²Corps of Engineers, *Minimum Fleet Capital Investment Report, 2012-2061* (Washington, D.C.: Dec. 12, 2011; revised Apr. 26, 2013).

³The Corps began implementing the restrictions on the workdays for the *Essayons*, *McFarland*, and *Yaquina* on October 1, 1993, and placed the *Wheeler* into ready reserve on October 1, 1997. See table 1 for the statutory restrictions in place on the use of the Corps’ hopper dredges, and how they have changed since fiscal year 2003.

⁴H.R. Rep. No. 104-695 at 158-59 (1996).

McFarland in ready reserve and limited the use of the vessel's work.⁵ In contrast, the 2007 act lifted the restrictions that had been in place on the number of days the *Essayons* and *Yaquina* could work.

In a review we conducted in 2003, we found that the restrictions in place at that time had imposed costs on the Corps' dredging program but had not resulted in proven benefits, such as increased industry competition or lower prices for hopper dredging.⁶ In our 2003 report, we made three recommendations to the Corps for improving the information used to manage its hopper dredges and develop cost estimates for industry contracts. Specifically, we recommended that the Corps

- obtain and analyze baseline data needed to determine the appropriate use of its hopper dredge fleet, such as data on emergency work performed by the Corps and solicitations that receive no bids;
- assess the data and procedures used to perform the cost estimate used when contracting dredging work to the hopper dredging industry; and
- prepare a comprehensive analysis of the costs and benefits of existing and proposed restrictions on the use of its hopper dredge fleet.

The Corps concurred with our recommendations and agreed to implement them.

You asked us to examine changes to the Corps' hopper dredging program since our review in 2003. This report examines (1) the actions the Corps has taken to address our 2003 recommendations for improving the information needed to manage its hopper dredging program and develop cost estimates for industry contracts; (2) the effects since 2003, if any, of the statutory restrictions placed on the use of the Corps' hopper dredges; and (3) key challenges, if any, the Corps faces in managing its hopper dredge fleet.

⁵Pub. L. No. 110-114, § 2047 (2007). The Corps placed the *McFarland* into ready reserve on December 30, 2009.

⁶GAO, *Corps of Engineers: Effects of Restrictions on Corps' Hopper Dredges Should Be Comprehensively Analyzed*, [GAO-03-382](#) (Washington, D.C.: Mar. 31, 2003).

To examine the actions the Corps has taken to address our 2003 recommendations, we reviewed the Corps' process for tracking and analyzing data on solicitations for private industry hopper dredging work, several sources of information the Corps maintains on the use of its hopper dredge fleet, the Corps' 2005 report to Congress on hopper dredges, and Corps documentation related to developing government cost estimates. To examine the effects since 2003, if any, of the statutory restrictions placed on the use of the Corps' hopper dredges, we analyzed the statutes and regulations governing the use of the Corps' hopper dredge fleet, reviewed Corps reports and financial data on the fleet, obtained and reviewed information from the dredging industry on its fleet of hopper dredges, and analyzed dredging data collected by the Corps through its Dredging Information System. To assess the reliability of the data, we interviewed Corps officials who maintain the database, reviewed related documentation, and tested the data for missing or erroneous values. We determined that the data we used were sufficiently reliable for our purposes. To examine key challenges, if any, the Corps faces in managing its hopper dredge fleet, we reviewed Corps studies and financial data on its hopper dredge fleet. For all three objectives, we interviewed officials from Corps headquarters, division offices, and the 9 Corps district offices with the largest hopper dredging workload during fiscal years 2003 through 2012 (out of a total of 17 district offices that contracted with industry for hopper dredging work during the time period). We also interviewed representatives from the five dredging companies that own and operate hopper dredges, and other stakeholders including local pilots' associations and port authorities from the areas where the Corps' hopper dredges are stationed, along with their national-level counterparts. In addition, we visited the Corps' four hopper dredges and one industry hopper dredge for informational tours of these vessels to gain a better understanding of their physical characteristics and operations. Appendix I describes our objectives, scope, and methodology in greater detail.

We conducted this performance audit from January 2013 to April 2014 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

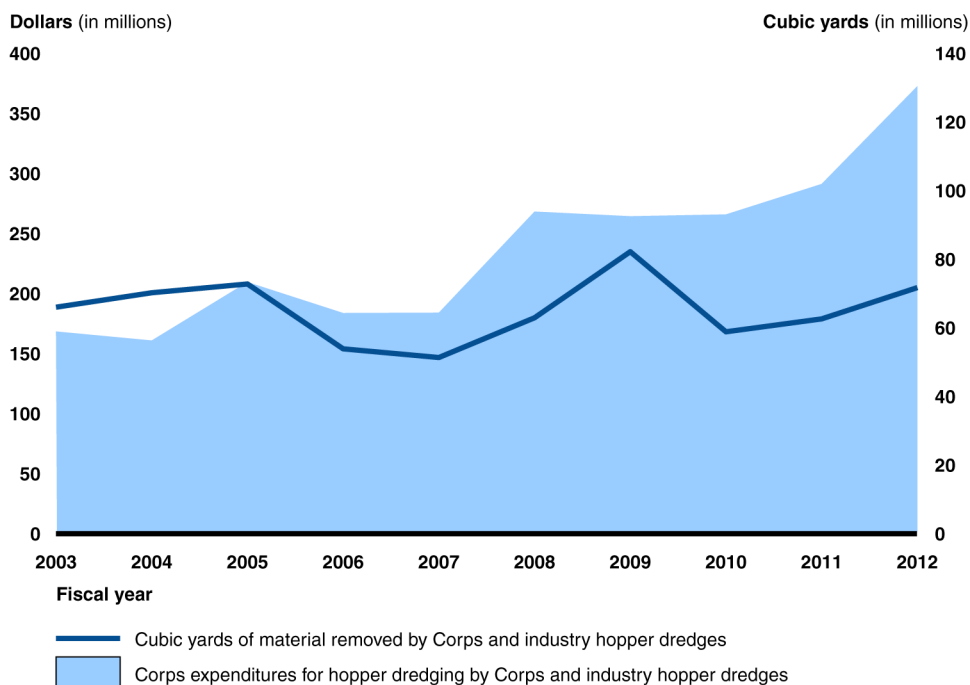
Since 1824, the Corps has been responsible for maintaining a safe, reliable, and economically efficient navigation system in the United States. This system currently comprises more than 12,000 miles of inland and intracoastal waterways and about 180 ports handling at least 250,000 tons of cargo per year. The accumulation of sediment in waterways—known as shoaling—reduces their navigable depth and, without dredging, may result in restrictions on vessels passing through the waterways. These restrictions often apply to the vessels' draft—the distance between the surface of the water and the bottom of the hull—which determine, in part, the minimum depth of water in which a vessel can safely navigate. Draft restrictions may result in delays and added costs as ships may need to off-load some of their cargo to reduce their draft, wait until high tide or until waterways are dredged, or sail into another port. For example, according to a 2011 Corps study, 1 foot of shoaling in the lower Mississippi River could result in \$2.8 billion worth of cargo being disrupted annually.⁷ To minimize such risks to navigation, the Corps removed an annual average of about 229 million cubic yards of material from U.S. waterways from fiscal year 2003 through fiscal year 2012, at an average annual cost of about \$1.1 billion, according to the Corps. Even with these efforts, draft restrictions have regularly been in place on major waterways throughout the United States in the past several years, according to Corps documents and officials.

The Corps contracts with industry to perform most dredging, including work done by hopper dredges. According to the Corps, of the approximately \$11 billion it spent for dredging from fiscal year 2003 through fiscal year 2012, about \$2.37 billion was for hopper dredging. Of that, industry hopper dredges accounted for about \$1.8 billion, and Corps hopper dredges accounted for about \$570 million. Corps spending on hopper dredging has more than doubled since fiscal year 2003, while the amount of material removed by hopper dredges has increased only slightly over that period, according to Corps data. Specifically, as shown in figure 2, the Corps spent nearly \$170 million for Corps and industry hopper dredges to remove around 66 million cubic yards of material in fiscal year 2003. By fiscal year 2012, Corps spending on Corps and industry hopper dredging had increased to about \$370 million, while the amount of material removed increased to nearly 72 million cubic yards. This growth in spending reflects costs for hopper dredging that, according

⁷Corps, 2011 *Minimum Fleet Capital Investment Report*.

to Corps documents, have increased because of rising costs for fuel and steel, among other factors.

Figure 2: Corps Expenditures for Hopper Dredging and Amount of Material Removed by Corps and Industry Hopper Dredges, Fiscal Years 2003 through 2012



Source: U.S. Army Corps of Engineers.

Note: The Corps' hopper dredging work is funded through the Corps' annual civil works appropriation and, in most years since 2003, through supplemental appropriations, such as those for Hurricane Katrina recovery efforts, the American Recovery and Reinvestment Act, and other sources.

Hopper dredging today is generally performed in three regions of the United States—the East Coast, Gulf Coast, and West Coast—and each region has at least one Corps hopper dredge that typically operates in it: the *McFarland* on the East Coast, the *Wheeler* on the Gulf Coast, and the *Essayons* and *Yaquina* on the West Coast. On the East and Gulf Coasts, the majority of the hopper dredging workload is carried out by industry dredges, while on the West Coast, Corps dredges remove more than half of the dredged material. Various factors can influence and complicate hopper dredging in each region. For example, on the East Coast, much of the hopper dredging must be performed during certain months of the year because environmental restrictions related to endangered sea turtles and other species prohibit dredging while those species are present. On the West Coast, the Corps must factor in the time and expense of moving

industry dredges through the Panama Canal if the only available industry hopper dredges are on the East or Gulf Coasts.

The sizes and capabilities of specific hopper dredges—and, therefore, the projects for which they are suited—vary. For instance, shallow ports and harbors cannot be dredged by vessels with deep drafts in many cases. The Corps uses the *Yaquina*, which is a small dredge with a draft of around 15 feet when its hopper is fully loaded,⁸ for dredging small and shallow ports along the California, Oregon, and Washington coasts. In contrast, the Corps uses the *Wheeler*, which is a large dredge with a draft of nearly 30 feet when its hopper is fully loaded, for deeper navigation channels such as those in the lower Mississippi River. See appendix II for a list of Corps and industry hopper dredges and their characteristics.

As noted, several pieces of legislation were enacted that sought to increase the role of industry in hopper dredging by placing restrictions on the use of the Corps' hopper dredges. More specifically, in 1978, legislation directed the Corps to contract out much of its hopper dredging work to industry and reduce the Corps' fleet to the minimum necessary to insure the capability of the federal government and industry together to carry out projects for the improvement of rivers and harbors. The Energy and Water Development Appropriations Act for fiscal year 1993, and subsequent appropriations acts in the early 1990s, required the Corps to offer for competitive bidding at least 7.5 million cubic yards of hopper dredging work previously performed by the federal fleet. The Corps addressed this requirement by reducing the use of each of its four dredges from about 230 workdays per year to about 180 workdays per year. The Water Resources Development Act of 1996 then required the Corps to take the *Wheeler* out of active status and place it into ready reserve. The Corps implemented this requirement beginning in fiscal year 1998 by generally limiting the *Wheeler* to working 55 days a year plus any urgent or emergency work. More recently, the Water Resources Development Act of 2007 required that the Corps place the *McFarland* in ready reserve and limited the use of the vessel to 70 working days per year in the Delaware River and Bay, plus any urgent and emergency

⁸A hopper dredge's size is determined by the capacity of its containment area or its "hopper"—small hopper dredges have a capacity of up to 3,000 cubic yards, medium hopper dredges have a capacity of 3,001 to 6,000 cubic yards, and large hopper dredges have a capacity over 6,000 cubic yards.

work.⁹ See table 1 for the statutory restrictions in place on the use of the Corps' hopper dredges and how they have changed since fiscal year 2003.¹⁰

Table 1: Statutory Restrictions and Other Information on the Use of the Corps' Hopper Dredges

	<i>McFarland</i>	<i>Wheeler</i>	<i>Essayons</i>	<i>Yaquina</i>
In ready reserve	Yes	Yes	No	No
Current limit on workdays	70 (in law)	70	None ^a	None ^a
Activities allowed within the limit	Routine dredging in the Delaware River and Bay to ensure its ability to perform urgent and emergency work	Routine dredging to ensure its ability to perform urgent and emergency work	Not applicable	Not applicable
Activities allowed beyond the limit	The Corps can call the dredge out of ready reserve for urgent or emergency dredging when industry dredges are unavailable	The Corps can call the dredge out of ready reserve for urgent or emergency dredging when industry dredges are unavailable	Not applicable	Not applicable
Changes since fiscal year 2003	Placed in ready reserve effective December 30, 2009	Change in workday limit from 55 to 70 effective fiscal year 2008	Removal of workday limit effective fiscal year 2009	Removal of workday limit effective fiscal year 2009

Sources: GAO analysis of selected legislation and Corps information.

^aRestrictions imposed by the Water Resources Development Act of 1996 effectively limited the *Essayons* and *Yaquina* to about 180 workdays. The Water Resources Development Act of 2007 lifted these restrictions and these two vessels resumed operations without restrictions on October 1, 2008.

⁹The 2007 act did not specify any change in the restrictions on the *Wheeler*; however, beginning in fiscal year 2008, the Corps increased the *Wheeler's* training days from 55 to 70 days. According to Corps officials, the Corps set the *Wheeler's* training days at 70 days to be consistent with the day limit established for the *McFarland* by the 2007 act.

¹⁰There have been other legislative attempts to further alter the operations of the Corps fleet. For example, a House-passed bill in 2006 would have eliminated all funding for operating and maintaining the *McFarland*, but not for decommissioning the vessel. H.R. 5427, § 104 (2006). A Senate appropriations bill for fiscal year 2012 would have required the Corps to fully utilize all Corps hopper dredges without restriction. H.R. 2354, § 110 (2011).

The Corps follows a process—known as the raise the flag procedure—for activating its ready reserve dredges to respond to urgent or emergency dredging needs. The Corps defines an urgent need for dredging as a time-sensitive situation that may require prompt action for providing a safe navigation channel, and an emergency as a situation that would result in an unacceptable hazard to life, a significant loss of property, or an immediate, unforeseen, and significant economic hardship if corrective action is not undertaken within a time period less than the normal contract procurement process. The raise the flag procedure includes a series of steps intended to allow industry the opportunity to respond to urgent or emergency dredging needs before the Corps uses its own dredges. The Corps district office with an urgent or emergency dredging need notifies the Corps division office overseeing it of the dredging need, and district and division staff review ongoing hopper dredging work under existing Corps contracts to see if any industry hopper dredges could be made available. If no industry hopper dredges could be made available, the offices notify Corps headquarters. The Corps' Director of Civil Works may then decide whether to use one of the Corps' ready reserve hopper dredges or make additional efforts to procure an industry dredge, such as by releasing a dredge from an existing contract.

The Corps contracts for most of the hopper dredging work by soliciting competitive bids from industry. To determine the reasonableness of contractor bids, the Corps develops a government cost estimate for its hopper dredging solicitations. Government cost estimates are developed using information on the costs of owning and operating hopper dredges—including acquisition, fuel, and shipyard costs—along with information on the project for which the dredging is needed—including the amount and type of material to be removed, and the distance from the dredging site to the placement site. In soliciting bids from contractors, the Corps most commonly uses a sealed-bid process, through which it generally awards the contract to the lowest bidder with a bid that is no more than 25

percent above the government cost estimate.¹¹ If the Corps does not receive any bids or if all bids exceed the government cost estimate by more than 25 percent, the Corps may pursue a number of options, including (1) negotiating with bidders to get the bid within an awardable range of the cost estimate; (2) reviewing the cost estimate and revising it based on additional information, as appropriate, or (3) performing the work itself such as through its raise the flag procedure.

The costs to own and operate hopper dredges include costs such as payroll for the crews, fuel, repairs, and depreciation. Hopper dredging requires large capital outlays—a modern hopper dredge comparable in size to the *Wheeler*, for instance, would cost around \$100 million to build, according to Corps and industry estimates—and related costs such as depreciation and replacement of engines or other major equipment can represent a relatively large portion of the dredges' total costs. The Corps and industry incur much of the costs for their hopper dredges—such as paying a crew and keeping engines and other systems in ready working condition—regardless of how much the dredges are used.

The Corps uses two funding sources from its annual civil works appropriation to pay for its hopper dredges. First, for the ready reserve vessels *McFarland* and *Wheeler*, funds are provided for each dredge to cover their costs while they are idle in ready reserve. Second, the Corps pays for the use of its dredges with project funds based on a daily rate it establishes for its dredges. According to Corps officials, the Corps sets a daily rate specific to each of its hopper dredges at least annually, based on factors such as the costs of owning and operating the dredge, and the amount of work the dredge is expected to perform. As the Corps uses its hopper dredges for projects, the Corps uses funds allocated for those specific projects to pay its dredges, based on the number of days its dredges work and the dredges' daily rate.

¹¹In addition to being no more than 25 percent above the government cost estimate, bids must be considered responsive in order to be awarded. One element the contractor generally must have in order for the Corps to consider a bid to be responsive is access to the required equipment for performing the scope of work. In addition to sealed-bid solicitations, the Corps awards hopper dredging contracts using requests for proposals, which allow the Corps to evaluate proposals on the basis of criteria other than price. Using the request for proposals process, the Corps may award a contract on a sole-source basis after negotiating with a single company because, for instance, there is an urgent need for dredging and soliciting work from multiple contractors would cause unacceptable delays. Additionally, a bidder who provides a responsive bid must be considered a responsible bidder which entails, among other things, that the bidder has adequate financial capability.

The Corps Has Taken Actions to Address Our 2003 Recommendations but Does Not Collect All of the Recommended Data

Since our 2003 review,¹² the Corps has taken actions to address our recommendations for improving the information needed to manage its hopper dredging program and develop cost estimates for industry contracts, but some data gaps remain. First, the Corps collects data on urgent or emergency hopper dredging work but does not consistently collect the data that we recommended on solicitations that received no bids or where all the bids received exceeded the Corps' cost estimate by more than 25 percent. Second, the Corps assessed the data and procedures for performing the cost estimates it uses when soliciting industry contracts in response to our recommendation, but the Corps has not obtained updated data for some costs used in these estimates. Third, in response to our recommendation to prepare an analysis of the costs and benefits of existing and proposed restrictions on the use of its hopper dredge fleet, the Corps developed a report analyzing options on how to best maintain and operate its fleet.

The Corps Collects Recommended Data on Urgent or Emergency Dredging but Does Not Consistently Collect Data on Certain Solicitations

In response to our 2003 recommendation to obtain and analyze baseline data needed to determine the appropriate use of its hopper dredge fleet, the Corps established a tracking log as part of its raise the flag procedure to maintain and review urgent or emergency work its hopper dredges carry out, but it does not consistently collect certain solicitation information that we recommended. Having a means to track urgent or emergency dredging work helps the Corps ensure it is documenting and evaluating when and under what circumstances it will use its ready reserve dredges. According to Corps officials, the Corps established a tracking log in 2007 to systematically track information on the circumstances when urgent or emergency hopper dredging may be needed, and specifically when Corps' dredges would be used to meet those needs. Corps district offices that are faced with critical hopper dredging needs submit information on their plans to address the needs to their division and Corps headquarters for review and approval. The Corps' decision-making process for determining whether to use its ready reserve vessels is also documented via its tracking log. For example, in January 2013, a hopper dredge was needed to perform work along the North Carolina coast because certain areas had become severely shoaled and were impeding safe navigation. One industry bid was received to perform the work, but it exceeded the government cost

¹²[GAO-03-382](#).

estimate by more than 25 percent. After determining its cost estimate was reasonable, the Corps negotiated with the industry bidder in an attempt to get the bid within an awardable range of the Corps' cost estimate, but the parties were unable to come to an agreement. As a result, the Corps initiated its raise the flag procedure because of the urgent nature of the situation. Because no other industry contractors were available immediately to respond, the Corps used the *McFarland* to perform the dredging and documented its decision-making process in its tracking log.

We also recommended that the Corps obtain and analyze other data that could be useful in determining the appropriate use of the Corps' hopper dredges, including data on solicitations that receive no bids or where all the bids received exceeded the Corps' cost estimate by more than 25 percent. Corps officials we spoke with said that they are aware when a no-bid or high-bid situation occur, particularly when they use a Corps dredge through their raise the flag procedure because of such a situation. But by tracking and analyzing no-bid and high-bid solicitation data, the Corps may be better positioned to identify gaps in industry's ability to fulfill certain dredging needs—such as during certain times of the year, in particular geographic areas, or for particular types of projects—and avoid or address any gaps identified. In 2004, the Corps took steps to address our recommendation by modifying data fields in its dredging database, the Corps' database for maintaining dredging information on each of its dredging projects, to collect data on no-bid and high-bid solicitations. We found, however, that data for these solicitations were not consistently entered into the database across the Corps district offices responsible for entering it. In our review of the Corps' dredging database, we found that one district office entered data on no-bid and high-bid solicitations. Corps officials from several district offices told us that entering information into the database is tedious and time-consuming. They also indicated that they do not enter information for all data fields because the officials primarily use information from the database for planning and scheduling future dredging work, not for reviewing data on past solicitations or solicitations that did not result in an awarded contract, which would include no-bid and high-bid solicitations.

Corps headquarters officials we spoke with recognized that tracking and analyzing data on no-bid and high-bid solicitations is important and could serve as a useful decision-making tool in planning future hopper dredging work. However, they have not provided written direction to the district offices to help ensure data on these solicitations are consistently entered into the database. According to officials we spoke with, they have not done so because of other higher-priority action items. The officials added

that they have made efforts to ensure district offices consistently enter accurate and complete data into the dredging database, such as emphasizing this activity during periodic meetings with district offices. These outreach efforts have been targeted at entering data into the dredging database as a whole, however, and have not focused specifically on the importance of the data field for tracking no-bid or high-bid solicitations, according to the officials. Federal internal control standards state that management should develop written policies and procedures that staff are to follow as intended.¹³ Without complete data on no-bid and high-bid solicitations, the Corps may be missing opportunities to plan future hopper dredging work that identifies and addresses potential gaps in industry's ability to fulfill certain dredging needs based on this solicitation information.

The Corps Reviewed Data and Procedures for Performing Cost Estimates, but Some Information Remains Outdated

In response to our recommendation to assess the data and procedures used to perform the cost estimate used when contracting dredging work to the hopper dredging industry, the Corps took several actions to improve its cost estimates, but some of the information it relies on remains outdated, such as its dredge equipment cost information dating back to the late 1980s.¹⁴ In 2004, and again in 2008, the Corps took actions to evaluate and update certain cost data used in its cost estimates. In 2004, the Corps prepared an internal document that summarized the steps it took to analyze, evaluate, and update certain cost data used in its cost estimates. For example, according to the document, the Corps examined repair and maintenance costs for industry hopper dredges and updated some data for dredge engines. In 2008, the Corps partnered with the Dredging Contractors of America (DCA)—a national association for the dredging industry—to update industry cost data. Corps documentation related to the effort indicated that the Corps learned important information through discussions with industry, and a senior Corps cost-estimating official that we spoke with said that, on the basis of these discussions, the Corps updated the training it provides to Corps staff on preparing hopper dredge cost estimates.

¹³GAO, *Standards for Internal Control in the Federal Government*, [GAO/AIMD-00-21.3.1](#) (Washington, D.C.: Nov. 1, 1999).

¹⁴As part of this recommendation, we also recommended that the Corps examine the policies related to calculating transit costs—the costs for an industry dredge to travel to a project site—because the Corps was relying on an expired policy for some of its solicitations. The Corps updated the regulation containing its policies on calculating transit costs in 2008.

Some of the data the Corps uses in preparing its hopper dredging cost estimates, however, remain outdated despite the Corps' attempt to update the information. Specifically, the Corps has not obtained updated technical data on industry hopper dredge equipment or labor rates but instead is relying on outdated information, some of which dates back to the late 1980s. During efforts to update the Corps' cost-estimating data in 2008, the Corps prepared a survey to collect industry dredge equipment information from the five dredging companies that owned hopper dredges. In cooperation with the Corps, DCA sent the survey to the companies. In the August 2008 letter accompanying the survey, the dredging association stated that "much of the cost basis the Corps uses for industry dredges is old data and limited due to lack of industry input" and noted that the Corps' ability to obtain the data would be mutually beneficial to the companies and the Corps. Among other things, data the survey sought to collect included costs of dredge acquisition, capital improvements, and certain types of repairs. Efforts to obtain these data were unsuccessful, however, due in part to industry's concerns about sharing business-sensitive data with the Corps. Industry representatives from one hopper dredging company we spoke with explained that they were concerned that cost data provided to the Corps might become accessible to their competitors and therefore the data were not provided. A senior Corps cost-estimating official we spoke with told us that the Corps limits the release of cost data used in preparing cost estimates within the Corps and that updated industry cost data would assist the Corps in preparing its cost estimates for hopper dredge work. The official also stated that other efforts could be made to obtain updated cost data, including performing a Corps-wide study to evaluate information from each Corps district office with hopper dredging contracts or reviewing contract audits. The Corps, however, has no plans for conducting such a study. In conducting a study, the Corps could assess the most effective and efficient approach for obtaining updated cost data, including examining whether and to what extent it would base its study approach on a review of contracts or contract audits, working directly with industry, or other approaches. Federal internal control standards state the need for federal agencies to establish plans to help ensure goals and objectives can be met.¹⁵ A written plan would assist the Corps in obtaining updated cost data and following sound cost estimating practices, as described in our 2009 cost estimating and assessment guide, which is a compilation of

¹⁵[GAO/AIMD-00-21.3.1](#).

cost-estimating best practices drawn from across government and industry.¹⁶ Obtaining reliable and up-to-date data are important for developing sound cost estimates, and the Corps' cost estimate credibility may suffer if technical data are not updated and maintained, as noted in our cost estimating guide.

The Corps Analyzed Options for Operating Its Hopper Dredges in a Report to Congress

In response to our 2003 recommendation that the Corps prepare a comprehensive analysis of the costs and benefits of existing and proposed restrictions on the use of the Corps' hopper dredge fleet, the Corps prepared an analysis of its fleet for a 2005 report to Congress.¹⁷ In its report, the Corps analyzed a number of options for operating its hopper dredges and made a recommendation to Congress for adjusting its fleet based on costs and benefits outlined in its analysis. The Corps recommended an option that it said would, among other things, ensure there was a viable reserve capability ready to respond to unforeseen requirements and ensure the timely accomplishment and reasonable cost for federal projects requiring hopper dredges. Under the option it recommended, the Corps would have (1) increased the *Essayons's* dredging by about 35 days, and kept the *Yaquina's* dredging days the same; (2) continued to keep the *Wheeler* in ready reserve; and (3) retired the *McFarland*. The Water Resources Development Act of 2007 did not specifically address these recommendations, but instead placed the *McFarland* in ready reserve and removed the then-existing restrictions on the *Essayons* and *Yaquina*.

¹⁶GAO, *Cost Estimating and Assessment Guide: Best Practices for Developing and Managing Capital Program Costs*, [GAO-09-3SP](#) (Washington, D.C.: March 2009). The guide states that updating and keeping cost estimates current to reflect changes in technical assumptions is one of the features of a high-quality, cost-estimating process and a best practice that helps develop reliable cost estimates that management can use for informed decisions.

¹⁷U.S. Army Corps of Engineers, *Report to Congress: Hopper Dredges* (Washington, D.C.: June 3, 2005). The 2004 Energy and Water Appropriations Act conference report referenced our 2003 report on the Corps' hopper dredges and also directed, among other things, that the Corps prepare an analysis of the costs and benefits of the existing and proposed restrictions on the use of its hopper dredges.

Statutory Restrictions on Corps Hopper Dredges Have Resulted in Additional Costs to the Corps, but Effects on Industry Competition Are Unclear

Since 2003, statutory restrictions on the use of the Corps' hopper dredges have resulted in additional costs, but it is unclear whether the restrictions have affected competition in the hopper dredging industry.¹⁸ Restrictions effectively limiting the number of days that Corps dredges can work have resulted in additional costs to the Corps, such as costs to maintain the ready reserve vessels while idle. On the other hand, the restrictions help ensure the Corps' ability to respond to urgent and emergency dredging needs when industry dredges may be unavailable. The extent to which restrictions on the use of the Corps' hopper dredges have affected competition in the dredging industry—as measured by the number of companies with hopper dredges and the number of bidders and winning bid prices for Corps projects—is unclear, based on our analysis of data on industry bids per Corps solicitation and other factors.

Statutory Restrictions Have Resulted in Additional Costs for Corps Hopper Dredging

Since 2003, statutory restrictions on the use of the four Corps' hopper dredges—in particular, the *Wheeler* and the *McFarland*—have resulted in additional costs to the Corps. First, the vessels have needed annual funding to maintain them in ready reserve because, given their limited use, the Corps is unable to recoup their costs with revenues from dredging work. The Corps incurs many of the costs for its hopper dredges—such as paying a crew and keeping engines and other systems in ready working condition—regardless of how much the dredges are used. For instance, placing the *McFarland* in ready reserve resulted in a substantial decrease in its dredging work (as measured in days worked and amount of material removed) but a relatively small decrease in its operating costs. As shown in table 2, the average annual cubic yards of material removed by the *McFarland* declined by 60 percent, while its average annual operating costs declined by 16 percent.¹⁹

¹⁸Similarly, we found, in 2003, that the restrictions on the Corps' hopper dredge fleet at that time had imposed costs on the Corps' dredging program, but had not yet resulted in proven benefits—such as more bids per Corps solicitation or lower prices for winning bids. See [GAO-03-382](#).

¹⁹We found, in 2003, that in the 4 years after the *Wheeler* was placed in ready reserve, the average cubic yards it dredged per year decreased by 56 percent from its average over the 4 years prior to being placed in ready reserve, while its average costs decreased by 20 percent over the same period. See [GAO-03-382](#).

Table 2: Summary of Operations and Cost Data for the Corps Dredge *McFarland*

Operations and cost data	Before ready reserve (fiscal years 2008 and 2009) ^a	After ready reserve (fiscal years 2011 and 2012) ^a	Percentage change
Average days worked	144	85	-41%
Average cubic yards of material removed	1,706,570	685,957	-60%
Average operating cost	\$9,208,887	\$7,766,939	-16%
Labor costs	\$4,420,847	\$3,919,780	-11%
Fuel, lubricants, and water costs	\$2,545,462	\$1,677,801	-34%
Other operating costs ^b	\$2,242,578	\$2,169,358	-3%

Source: GAO analysis of U.S. Army Corps of Engineers data.

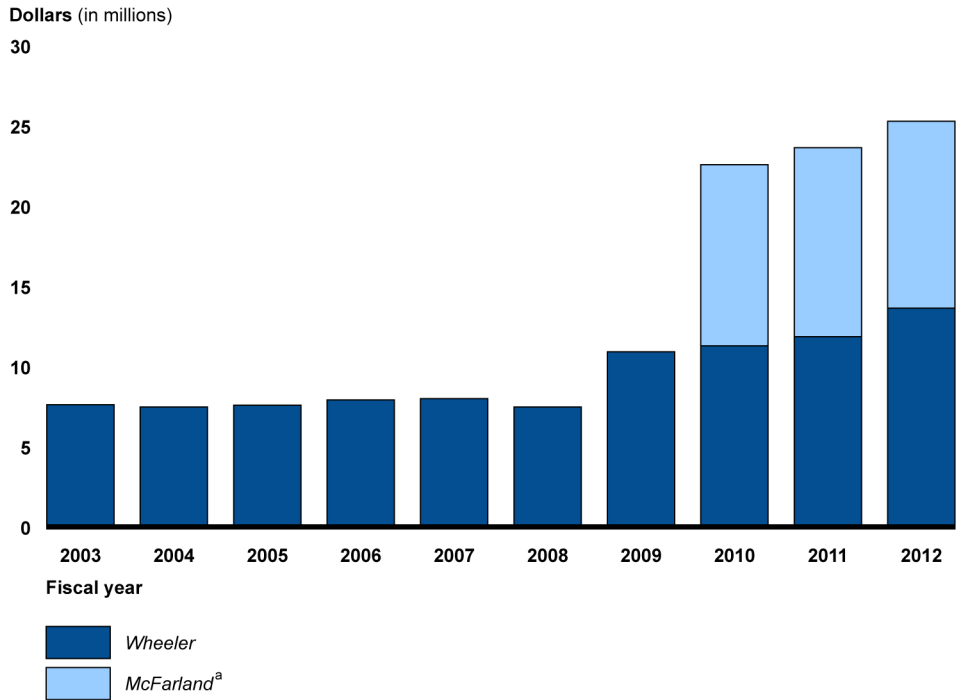
Note: All cost amounts are in constant 2013 dollars. Hopper dredges in ready reserve are used primarily for training purposes and can be called into active status only in limited circumstances, such as emergencies.

^aThe *McFarland* was placed in ready reserve on December 30, 2009. Therefore, the period before ready reserve includes the 2 full fiscal years prior to ready reserve—2008 and 2009—while the period after ready reserve includes the 2 full fiscal years following ready reserve—2011 and 2012. Limiting the period before ready reserve to 2 fiscal years reduced the effect of long-term changes, such as increasing fuel prices, on the *McFarland's* costs prior to ready reserve.

^bOther operating costs include overhead, crew training, and information technology services, among others.

Annual funding needed to maintain the *Wheeler* and the *McFarland* in ready reserve, which is provided through the Corps' civil works appropriation, has increased since 2003. Specifically, in fiscal year 2003, ready reserve funding for the *Wheeler* was \$7.6 million, and it increased to \$13.6 million in fiscal year 2012. In addition, the *McFarland* has received ready reserve funding of over \$11 million each fiscal year since it was placed in ready reserve, resulting in total ready reserve funding for the vessels of over \$25 million in fiscal year 2012 (see fig. 3).

Figure 3: Ready Reserve Funding for the Corps Dredges *Wheeler* and *McFarland*, Fiscal Years 2003 through 2012



Source: U.S. Army Corps of Engineers.

Note: Hopper dredges in ready reserve are used primarily for training purposes and can be called into active status only in limited circumstances, such as emergencies.

^aThe *McFarland* was placed in ready reserve on December 30, 2009, and it began receiving ready reserve funding in fiscal year 2010.

Second, the ready reserve restrictions have contributed to increases in the daily rate the Corps charges projects for use of the *Wheeler's* service, and future increases in the *McFarland's* daily rate may also be needed if it experiences unanticipated cost increases.²⁰ Increases in daily rates may result in either increasing costs, fewer cubic yards of material removed, or both, for the projects that use the *Wheeler* and *McFarland* —primarily

²⁰Daily rates for Corps hopper dredges have increased and may continue to increase due to several factors such as increasing fuel costs and changes in Corps accounting methods, in addition to ready reserve restrictions. While future increases in the *McFarland's* daily rate may be needed if unanticipated cost increases are experienced, such increases could also apply to any of the Corps' hopper dredges. We did not quantify the extent to which individual factors contributed to increases in daily rates.

projects in the Delaware River and the Mississippi River mouth, respectively. Officials from Corps headquarters and district offices responsible for the ready reserve hopper dredges told us they set the dredges' daily rates in part based on how many days they expect the dredges to work in the coming year and that, in the case of the *Wheeler*, the limited dredging days since being placed in ready reserve have contributed to higher daily rates. For instance, the *Wheeler's* daily rate has increased from \$75,000 in fiscal year 2003 to \$140,000 in fiscal year 2012, and the Corps expects a rate of \$165,000 during fiscal year 2014. Furthermore, although costs for industry hopper dredge work have also increased, officials from a Corps district office that historically used the *Wheeler* told us that they would now be reluctant to use the vessel instead of an industry hopper dredge because of its high daily rate. In the case of the *McFarland*, the Corps has increased the vessel's daily rate from \$94,000 in fiscal year 2009 (the last full fiscal year before it was placed in ready reserve) to \$100,000 in fiscal year 2012, and officials said they planned to increase and then maintain the daily rate at \$110,000 for the next several fiscal years. If there are unanticipated increases in costs for the *McFarland*, however, such as an unexpected increase in repair costs, Corps officials said they would likely have to increase the vessel's daily rate to cover such costs. As the officials explained, they set the *McFarland's* daily rate with an expectation that the vessel will work 70 days because the ready reserve restrictions do not allow them to increase the number of days the *McFarland* can work. Therefore, raising the vessel's daily rate would be the Corps' primary option to cover an increase in costs.

On the West Coast, restrictions on the number of days the Corps' hopper dredges *Essayons* and *Yaquina* could work had led to inefficiencies in completing their work before those restrictions were lifted by the Water Resources Development Act of 2007, according to Corps officials. Before the 2007 act, the *Essayons* and the *Yaquina* were restricted to working about 180 workdays annually and, for several years, they reached their operating limits and, therefore, had to return to port before the projects they were working on were finished. The dredges were then sent back to complete the projects once the new fiscal year began, which was in October when weather conditions had begun to deteriorate. As a result, the Corps incurred additional transit and payroll costs while returning to complete the projects. Since the restrictions on these dredges were removed under the 2007 act, Corps officials said they have not had to interrupt ongoing work due to operating limits on the dredges and have had greater flexibility regarding when to perform work.

Ready Reserve Restrictions Help Ensure the Corps' Ability to Respond to Critical Dredging Needs

The ready reserve restrictions on the *Wheeler* and *McFarland* help ensure that they are available to the Corps for responding to urgent and emergency dredging needs, especially in the regions where the dredges are stationed. Demand for hopper dredging often varies substantially from year to year, and month to month, due in part to severe weather events such as hurricanes and floods, other events such as the Deepwater Horizon oil spill in 2010, or environmental restrictions that limit dredging work to certain months of the year. This variability has resulted in periods of high demand during which the Corps has used its ready reserve hopper dredges to respond to urgent or emergency dredging needs when industry hopper dredges were not available. As the Corps noted in its 2005 report to Congress, having the *Wheeler* in ready reserve is important to ensure that the vessel is available when unforeseen dredging needs occur, while more fully utilizing the *Wheeler* could limit the Corps' capability to respond to peak workload demands.²¹ Specifically, the Corps has used the *Wheeler* to respond to urgent or emergency dredging needs 15 times during fiscal years 2003 through 2012.²² In these cases, according to Corps documents, industry dredges were unavailable to immediately respond to time-sensitive dredging needs at the mouth of the Mississippi River, and the Corps was able to quickly move the *Wheeler* to the site and conduct the work. Similarly, local pilots and a local port authority we spoke with told us that the *McFarland* has been critical in addressing dredging needs on the Delaware River and Bay, where the vessel is stationed in ready reserve. Since its placement in ready reserve at the end of 2009, the Corps has used the *McFarland* to respond to urgent or emergency needs 4 times. Industry representatives from most dredging companies we spoke with agreed that there is a need for Corps hopper dredges, specifically those placed in ready reserve, to respond to urgent or emergency situations when industry hopper dredges are unavailable.

²¹U.S. Army Corps of Engineers, *Report to Congress: Hopper Dredges* (Washington, D.C.: June 3, 2005).

²²Private industry hopper dredges may also respond to urgent or emergency dredging needs, precluding the need for the Corps to use one of its dredges. The Corps does not systematically track data on when it contracts with private industry to respond to urgent or emergency dredging events, however, and so data are not available to compare the use of Corps' dredges and industry dredges to respond to urgent or emergency events.

The Extent to Which Restrictions Have Affected Industry Competition Is Unclear

Since 2003, the extent to which restrictions on the use of the Corps' hopper dredges have affected competition in the dredging industry—as measured by the number of companies with hopper dredges and the number of bidders and winning bid prices for Corps projects—is unclear. A possible benefit of restrictions on the amount of work performed by the Corps' hopper dredges is that the increased demand for industry hopper dredging services could encourage existing firms to add dredging capacity or new firms to enter the market, which could promote competition, raising the number of bidders and lowering winning bid prices for hopper dredging contracts. In addition, according to dredging industry representatives we spoke with, the more industry dredges can be utilized instead of Corps dredges, the lower the contract prices will be because contractors can spread their costs over more days of operation. However, on the basis of our analysis of (1) the dredging industry, (2) the number of bidders and bid prices for Corps dredging contracts, and (3) other factors that may have affected the level of competition for hopper dredging contracts, it is unclear whether or to what extent the restrictions on the Corps' hopper dredges may have increased the level of competition in the hopper dredging industry.

First, since 2003, the number of companies with hopper dredges in the United States has not changed, although the number of industry hopper dredges and the total size of these dredges have decreased. Specifically, at the end of 2013, five companies operated one or more hopper dredges. The same number of companies operated hopper dredges in 2003. Of the five companies we reported on in 2003, two sold their hopper dredges and exited the hopper dredging market while two new companies that had not been in the market acquired hopper dredges, and three companies remained the same. Since 2003, the total number of industry vessels decreased from 16 to 13, and the total capacity of these vessels, as measured in cubic yards, decreased by 16 percent. The decrease from 16 to 13 vessels resulted from one company relocating four of its U.S. hopper dredges overseas to perform dredging work

primarily in the Middle East,²³ while another company built a new hopper dredge for the U.S. market. In addition, as of January 2014, one company had begun building a new hopper dredge that it expects will be completed in late 2014 or early 2015, and another company announced plans to build a new hopper dredge that it expects will be completed in 2015. If no companies remove existing hopper dredges from the U.S. market, these two dredges, if built as planned, would increase total industry capacity to 13 percent above 2003 levels. According to industry representatives with whom we spoke, dredging companies consider restrictions on the Corps' hopper dredges in deciding whether to acquire or build a new hopper dredge, but they also consider other factors, such as anticipated funding levels by the Corps, as well as nonfederal work.

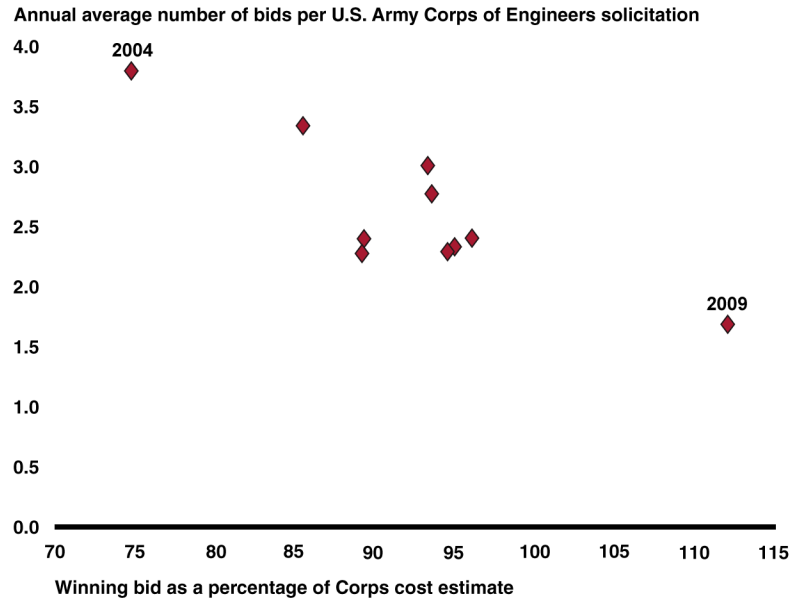
Second, we did not find evidence of increased competition based on the number of bidders and winning bid prices for Corps hopper dredging projects since 2003. Economic principles suggest that an increase in the number of competitive bidders in the market should lead to lower prices. The correlation between the number of companies competing for hopper dredging contracts and the winning bid prices for those contracts is demonstrated by the Corps' historical data.²⁴ As shown in figure 4, in years where there were more industry bids per Corps solicitation, the average winning industry bid, as a percentage of the Corps' cost estimate, was generally lower, consistent with economic principles.²⁵

²³According to a representative from DCA, a lack of work in the United States was also a factor in the relocation of some of these industry vessels. A vessel may engage in dredging in U. S. waters only if it is built, owned, and flagged in the United States. As a result, vessels that are relocated overseas and operated under a foreign flag are unable to dredge in the United States. The process of reflagging under the U.S. flag is generally so costly that it would effectively cause a dredge to be unable to compete in the United States, according to dredging industry representatives. As a result, the Corps and the dredging industry do not consider U.S.-owned dredges operating in foreign markets in their planning or analyses of the U.S. market.

²⁴This analysis shows a relationship between the number of bids per Corps solicitation and the winning bid prices for those solicitations, but it does not establish a cause-and-effect relationship.

²⁵Similarly, we found, in 2003, that from fiscal year 1990 through fiscal year 2002, years with more industry bids per Corps solicitation for hopper dredging generally had lower winning bid prices on average relative to the Corps' cost estimate. See [GAO-03-382](#).

Figure 4: Annual Average Number of Industry Bids per Corps Solicitation and Winning Bid as a Percentage of the Corps' Cost Estimate, Fiscal Years 2003 through 2012



Source: GAO analysis of U.S. Army Corps of Engineers data.

Note: Each point represents a fiscal year. We limited this analysis to awarded, sealed-bid solicitations because those are the solicitations for which the Corps has reliable data on numbers of bids and bid prices. We also limited the analysis to maintenance projects because, according to Corps officials and industry representatives, new construction projects are inherently uncertain and, therefore, new construction cost estimates and bid prices have greater variation and less accuracy than those for maintenance projects, which tend to occur regularly and have a history of price information.

Moreover, available Corps data related to the placement of the *McFarland* in ready reserve do not show evidence of increased competition in the dredging industry. Specifically, as shown in table 3, after the *McFarland* was placed in ready reserve, average winning bid prices increased for East Coast maintenance projects (i.e., projects the *McFarland* might undertake if use of the vessel were not restricted), and the average number of bids for those same projects decreased slightly.²⁶

²⁶Similarly, we found, in 2003, that after restrictions were placed on the number of days the Corps' hopper dredges could work, the average number of bids per Corps solicitation decreased, and the percentage of winning bids below the Corps' cost estimate decreased.

Table 3: Winning Bid Prices and Number of Bids for East Coast Maintenance Hopper Dredging Projects, Before and After the *McFarland's* Placement in Ready Reserve

	Before ready reserve (fiscal years 2003 through 2009)	After ready reserve (fiscal years 2011 and 2012) ^a
Winning bid as a percentage of Corps' cost estimate	84 percent	92 percent
Average number of bids per solicitation	2.9	2.8

Source: GAO analysis of U.S. Army Corps of Engineers data.

Note: We limited this analysis to awarded, sealed-bid solicitations because those are the solicitations for which the Corps has reliable data on numbers of bidders and bid prices. In sealed bidding, a contract is awarded to the responsible bidder with a bid that conforms to the invitation for bid and is the most advantageous for the government considering price and price-related factors included in the invitation. Approximately 76 percent of hopper dredging contracts awarded by the Corps from fiscal year 2003 through fiscal year 2012 were awarded through a sealed-bid process. We also limited the analysis to maintenance projects, because Corps dredges do not generally perform other types of projects such as new construction and, therefore, restrictions on Corps dredges would not have had an effect on industry competition for such projects.

^aThe period after ready reserve includes the 2 full fiscal years following the *McFarland's* placement in ready reserve on December 30, 2009.

Third, other factors aside from the ready reserve restrictions may have affected the level of competition in the dredging industry since 2003. Examples of such factors include the following:

- *Environmental restrictions.* Multiple Corps officials and industry representatives told us that environmental restrictions related to endangered sea turtles and other species—which prohibit dredging during the time of year that those species are present—have contributed to fewer bidders for hopper dredging projects, particularly on parts of the East Coast. For instance, because of environmental restrictions, navigation dredging in fiscal year 2014 is limited to December 15, 2013, through March 31, 2014, in much of the Corps' South Atlantic Division,²⁷ during which time there are 48 potential Corps dredging projects planned, according to a 2013 Corps planning document. Corps officials attributed the absence of awardable bids for several recent East Coast hopper dredging solicitations to the unavailability of industry hopper dredges when the projects were

²⁷The Corps' South Atlantic Division extends from North Carolina to the eastern portion of the Gulf Coast.

scheduled to occur—during the period of high demand for hopper dredges caused by environmental restrictions. In addition, they expressed concern that similar shortages of bids could occur in the future.

- *Coordination among Corps district offices.* Increased coordination in scheduling hopper dredging projects across Corps district offices has helped distribute projects more evenly over time so that more companies had hopper dredges available with which to bid on projects, according to Corps officials. In contrast, when a large number of projects occur at the same time, dredging companies may not have enough dredges available to bid on all projects, thereby reducing the number of bidders for the projects. According to Corps officials we spoke with, increased regional coordination and sharing of up-to-date information on upcoming dredging needs across district offices has helped the Corps to better inform industry of planned work and align the scheduling of projects with the availability of industry dredges. In particular, Corps officials said increased coordination helped the Corps avoid scheduling too many projects simultaneously during a period of increased demand for hopper dredging work following Hurricane Sandy and a Gulf Coast rebuilding effort to protect against the coastal impacts of oil spills.
- *Demand for nonfederal hopper dredging work.* Corps officials and industry representatives also told us that demand for hopper dredging work from states, private sources, and foreign governments has reduced the number of industry hopper dredges available for Corps projects. For instance, following the Deepwater Horizon oil spill in 2010, there was an increase in private and state funding for hopper dredge work to construct barrier islands to protect the coastline from the effects of the oil spill. Demand for hopper dredges for this work affected the dredges' availability for Corps navigation projects, according to Corps documents and officials, and industry representatives. In addition, representatives from one company said that, in part, because of increasing demand for hopper dredges from foreign governments—specifically in the Middle East—the company relocated several hopper dredges overseas, removing them from the U.S. market.
- *Differences in hopper dredge capabilities.* Because there are important variations in the size and capabilities of hopper dredges, the requirements of specific dredging projects can result in a limited number of dredges that may be able to effectively compete for a particular dredging project. For instance, the state of California

requires hopper dredges to use reduced-emissions engines, in accordance with state air quality regulations. Of the 13 industry hopper dredges, only 3 have such engines, according to a Corps official. Similarly, according to Corps documents, a hopper dredge working at the mouth of the Columbia River in Oregon must be able to dredge against strong currents and endure large waves—capabilities that less than half of the industry fleet possesses, according to a Corps official. Other requirements, such as the depth of the waterway being dredged, or whether the material removed needs to be pumped onto the shore, can also limit which dredges can effectively compete for and carry out the work.

The Corps Faces Challenges Regarding the Fiscal Sustainability and the Future Composition of Its Hopper Dredge Fleet

Key challenges the Corps faces in managing its hopper dredge fleet are (1) ensuring the fiscal sustainability of its hopper dredges and (2) making decisions about the future of its hopper fleet composition, including the utilization of its existing fleet, changes to its existing fleet—including repairs, and the replacement or retirement of any vessels—and the utilization of any new replacement vessels.

The Corps Faces Challenges in Ensuring the Fiscal Sustainability of Its Hopper Dredges

The Corps faces challenges in ensuring the fiscal sustainability of its hopper dredges. In a 2012 study the Corps conducted on the fiscal condition of its hopper dredges, it identified increasing ownership and operating costs for its four hopper dredges, among other things, as a cause for concern and stated that the dredges would become unaffordable unless actions were taken.²⁸ For instance, the Corps' study projected that, in fiscal year 2012, the Corps' total end of fiscal year account balance for its four hopper dredges would exceed their funding levels by over \$15 million dollars, and that fiscal problems would continue for the four hopper dredges through fiscal year 2016. The Corps stated in the study that it was concerned that project funding, which the Corps' hopper dredges depend on to varying degrees, was not increasing and, in some cases, was decreasing.

²⁸Army Corps of Engineers, *USACE Dredge Back to Black Plan* (Washington, D.C.: June 29, 2012).

The Corps' 2012 study identified several actions to take to operate all of its hopper dredges with a positive account balance by the end of fiscal year 2015. For example, based on the study, a corresponding July 2012 implementation memorandum, and our discussions with Corps officials, the Corps

- increased the daily rates all four of the Corps' hopper dredges charge to projects that use the dredges, beginning in fiscal year 2012;
- increased funding in fiscal years 2013 and 2014 budgets for projects that use its hopper dredges to compensate for the vessels' corresponding increases in daily rates; and
- formed a team to conduct a hopper dredge operating cost review including, among other things, an evaluation of the affordability of two hopper dredges, the *Wheeler* and the *Yaquina*, by June 30, 2014.²⁹

Corps officials told us that the actions identified in its study will help return the Corps' hopper dredges to a fiscally sustainable position by the end of fiscal year 2015. Since the Corps prepared its study, however, two of its hopper dredges encountered problems that significantly increased the dredges' total deficit: the *Essayons* had a dredging accident in 2013, and the *Wheeler* experienced an unforeseen delay in completing its engine replacement.³⁰ Even with these added costs, Corps officials said they expect to be able to reach their goal of returning each of the hopper dredges to fiscal sustainability by the end of fiscal year 2015, but they also acknowledged that this goal has become more challenging. For example, the officials said that, while the *Essayons'* accident increased its

²⁹According to Corps criteria for these studies, the Corps' evaluation of these vessels will include examining current and future Corps mission requirements, and the affordability of the vessel, including operating costs, program support, likely alternative funding sources, planned investments along with those to date, and the additional hidden costs of vessel support (such as spare parts inventory, shoreside personnel and facilities, and the impacts of any personnel action, etc.).

³⁰A Corps official told us that the August 2013 grounding accident that the *Essayons'* experienced while dredging made the vessel inoperable for about a month while it underwent repairs. In the case of the *Wheeler*, a Corps official estimated that the delays in replacing the *Wheeler's* engines caused the vessel to remain out of operation at least 4 months more than the Corps initially planned. In addition, during this time, a cruise vessel broke free from its moorings during a storm and collided with the *Wheeler* when it was in the repair yard, which further delayed the *Wheeler's* return to work, according to the Corps.

deficit by about \$2 million, increasing the vessel's daily rate in fiscal year 2014 and dredging work in fiscal years 2014 and 2015 would give the vessel a positive account balance. Corps officials acknowledged that the *Wheeler's* situation was more precarious because it ended fiscal year 2013 with a deficit of over \$5 million more than projected in the Corps' 2012 study, given the engine replacement delay. To get the *Wheeler* to a positive account balance by the end of fiscal year 2015, Corps officials said that they anticipated increasing the *Wheeler's* daily rate and potential dredging activity to more than 70 days under ready reserve in fiscal year 2014. Corps officials said they believe they have some flexibility with the number of days the vessel can dredge since there is not a set amount specified in statute.³¹ Corps officials stated they are not planning further actions beyond those identified in the 2012 study at this time, but they acknowledged that additional measures, such as pursuing a permanent increase in the amount of days that the *Wheeler* may dredge each year under ready reserve, might be warranted if the vessel's fiscal situation does not improve by the end of fiscal year 2014.

The Corps Faces Challenges in Determining the Future Composition of Its Hopper Dredge Fleet

The Corps also faces challenges in making decisions about the future composition of its hopper dredge fleet. Some of the factors that make it difficult for the Corps to determine what composition of its fleet would best allow it to conduct dredging activities in the manner most economical and advantageous to the United States include the following:

- *Aging Corps' fleet.* The aging of the Corps' hopper fleet, contrasted with the millions of dollars the Corps has invested to upgrade the vessels, has made it challenging for the Corps to determine the long-term sustainability of its hopper dredges. Three of the Corps' four hopper dredges—*Essayons*, *Wheeler*, and *Yaquina*—have been in service for at least 30 years, and the *McFarland* has been in service over 45 years. According to Corps documentation, the Corps plans a 50-year investment life for its hopper dredges and, based on historical records, major repairs are typically needed when a dredge is about 30 years old. Since 2009, the Corps has invested millions of dollars in

³¹The *Wheeler* is not statutorily limited to a specific number of annual training days under ready reserve, but, since fiscal year 2008, the Corps has targeted the vessel's work to 70 training days annually, which is the same number of days the *McFarland* is permitted to work by statute under ready reserve. Both ready reserve vessels can also be used in urgent or emergency situations beyond their 70-day limits. See table 1 for the statutory restrictions in place on the use of all the Corps' hopper dredges.

replacing and upgrading needed equipment on its four hopper dredges. For example, among other things, the *Essayons*, *Wheeler*, and *Yaquina* all had their engines replaced within the last 5 years allowing them to meet higher air quality emission standards. Similarly, the *McFarland's* electrical systems were replaced in fiscal year 2011, which increased the vessel's efficiency, since many of the systems were original equipment. According to Corps documents and officials, overall, all four hopper dredges are in good operating condition, but given the age of the vessels, the Corps has recognized the need to assess future repair or replacement options for its hopper dredges.

- *Effects on industry.* Because the Corps relies on both its own dredges and industry dredges to complete hopper dredging work, it needs to factor in both fleets in making future decisions about the composition of its own fleet. As of March 2014, 13 hopper dredges in the U.S. industry fleet had been in service for an average of about 27 years, though information on the extent to which these vessels have been maintained, upgraded, or may be close to going out of service has not been shared by industry with the Corps. During a discussion with industry representatives, however, representatives said that the hopper dredging industry is driven by competition, and they maintain their dredges to be as efficient as possible to improve their competitiveness in the market. Corps officials from several district offices we spoke with said that, because of the increasing use of industry hopper dredges for nonfederal beach nourishment projects, as well as anticipated increases in federal hopper dredging projects, industry's availability to respond to the nation's navigation dredging needs may be stretched. These officials said that, as a result, maintaining the Corps' current fleet composition and perhaps increasing the use of some of the vessels, may be warranted. In contrast, most of the industry representatives we spoke with said they believe that industry has the ability to handle any increases in dredging projects, and the Corps' fleet should be further restricted or even reduced. These representatives stated that if the Corps increased its hopper dredge capability, then industry's portion of the overall dredging work would be reduced possibly leading companies to increase prices to cover their operating costs or potentially relocate their hopper dredges overseas.
- *Funding uncertainties.* Variability regarding federal funding for dredging also poses challenges to the Corps' plans for its fleet. While funding for hopper dredging has increased since fiscal year 2003 and was about \$370 million in fiscal year 2012, Corps officials and stakeholders we spoke with said that, at recent funding levels, there

were substantial unmet hopper dredging needs such as providing dredging for small ports and harbors.³²

In a 2011 study related to the capital investment in its minimum dredge fleet, the Corps recognized the need to examine whether it should change the composition of its hopper fleet, such as by retiring one or more of its vessels, with or without a replacement.³³ Among the reasons the Corps listed for preparing this study were increases in the dredges' operating costs, the estimated costs of replacing the vessels, their increasing age, and the potential risk to navigation from reduced minimum fleet availability. The study found that the Corps' current approach to operating its minimum fleet would eventually increase the risk to navigating the waterways the Corps was responsible for dredging. To minimize that risk, the study and its corresponding August 2013 implementation memorandum, identified several actions, along with targeted time frames, that the Corps should take, including

- evaluating the *McFarland's* replacement options in 2017, which would consider replacing it and the *Wheeler* with one medium-sized hopper dredge;³⁴
- deferring minimum fleet sustainment and improvement actions, such as modifications to improve certain hopper dredges' engine emissions, until at least fiscal year 2016 and possibly longer; and

³²As of the time of this report, pending water resources development legislation in both the House and Senate would propose increasing annual funding for maintenance dredging through fiscal year 2020 and beyond. In addition, the Senate bill would require the Corps to study, among other things, "the needs of the United States for dredging, including the need to increase the size of private and Corps of Engineers dredging fleets to meet demands for additional construction or maintenance dredging needed as of the date of enactment of this Act and in the subsequent 20 years." H.R. 3080 (as amended by the Senate) § 2024(b)(2) (2013).

³³Corps, 2011 *Minimum Fleet Capital Investment Report*. This study encompassed all 10 dredges in the Corps' minimum dredge fleet, which includes the 4 hopper dredges reviewed in this report, and 6 other dredges of different types that are generally used for different dredging projects.

³⁴According to the minimum fleet study, "replacement options" include replacement, recapitalization, retirement, or divestment. The study noted that the *McFarland* and *Wheeler* were two primary vessels where consolidation is most likely to be considered, although the study also showed that the *Wheeler* was not scheduled to be evaluated for replacement until 2037.

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- conducting a life-cycle cost analysis to support funding plans for future dredging needs which would include a cost comparison to either (1) use and then replace the vessels or (2) repair and sustain the vessels.

The 2011 study developed options based on three funding scenarios—increased, sustained, or decreased—and, as stated in the study and the Corps' implementation memorandum, the Corps selected the option associated with sustained funding levels as the best course of action. Should increased funding become available for dredging, a Corps official we spoke with said the Corps may need to adjust its planned course of action. The officials said that the 2011 study could provide the Corps with direction for adjusting its actions. For example, as noted in the study under the increased funding scenario, the Corps could continue with its planned fleet improvements instead of deferring them under the sustained option.

Conclusions

Hopper dredges play a vital role in keeping the nation's ports, harbors, and other waterways open for commerce. Over the past several decades, the Corps has increasingly relied on industry to carry out hopper dredging work, but it has also maintained its own minimum fleet of four hopper dredges, in part to ensure its ability to respond to critical dredging needs during periods of high demand. The Corps is faced with the task of balancing the hopper dredging work it contracts out to industry and maintaining the viability of its own fleet. The Corps has recognized the need to make changes to manage its hopper dredge fleet in a fiscally sustainable manner and has taken several actions to do so, including assessing the need to potentially modify the composition of its fleet. Since our 2003 report, the Corps has also made progress in addressing our recommendations to improve the information it maintains to manage its hopper dredging program, including modifying data fields in its dredging database to track solicitations that receive no bids or where all the bids received exceeded the Corps' cost estimate by more than 25 percent. However, because Corps district offices are not consistently populating the database with these solicitation data, the Corps does not have accurate or complete information that may help it identify potential gaps in industry's ability to fulfill certain dredging needs, which could inform its plans for future hopper dredging work. Additionally, the Corps made attempts to update the industry cost data it uses to prepare its cost estimates for hopper dredging contracts. Yet, some of the data it relies on remain outdated, and the Corps has no plans to update the information, such as through a Corps-wide study. Until the Corps has a plan for

obtaining and then consistently updating reliable cost data, the Corps' ability to ensure the soundness of its cost estimates may suffer.

Recommendations for Executive Action

We recommend that the Secretary of Defense direct the Corps of Engineers to take the following two actions:

To ensure the Corps of Engineers has the information it needs to analyze and make informed decisions regarding future hopper dredging work, provide written direction to its district offices on the importance of and need to accurately and consistently populate the data fields in its dredging database that track solicitations that receive no bids or where all the bids received exceeded the Corps' cost estimate by more than 25 percent.

To assist the Corps in preparing sound and credible cost estimates for soliciting bids for hopper dredge work by industry, develop a written plan for conducting a study to obtain and periodically update data on hopper dredging costs for its cost estimates, including reliable data on industry hopper dredge equipment and labor rates.

Agency and Third-Party Comments and Our Evaluation

We provided a draft of this report to the Department of Defense and the Dredging Contractors of America (DCA) for review and comment. In its written comments, reprinted in appendix III, the Department of Defense concurred with our recommendations and stated that (1) the Corps will issue a letter to the district offices reinforcing the need to provide accurately and timely information in the Corps' dredging database, including information for solicitations that receive no bids or where all the bids received exceeded the Corps' cost estimate by more than 25 percent and (2) the Corps will develop a written plan as resources allow. The Corps also provided technical comments that we incorporated, as appropriate.

DCA provided written comments, which are summarized below and reprinted in appendix IV along with our responses. DCA neither agreed nor disagreed with our recommendations but disagreed with several statements in our report and raised objections to certain aspects of our scope and methodology. We disagree with DCA's comments as discussed below. Specifically, in its comments, DCA disagreed with our statement that a direct and valid comparison of work performed by industry to work performed by the Corps is not possible and stated that a third-party consultant performed an analysis of the Corps and industry

hopper dredges performing similar work. According to DCA's comments, the industry hopper dredges can work for significantly less than Corps dredges. As we state in our report, we believe that a number of factors prohibit a direct and valid comparison of the Corps' and industry's costs of performing hopper dredge work, including limits to the number of days some Corps' dredges may operate and differences between dredging projects, such as the type of material dredged. In providing its estimates of cost savings for industry dredging, DCA did not provide information indicating how or whether it took such factors into account or to enable us to evaluate the reasonableness of its estimates.

DCA also questioned how, if one of the fundamental conclusions of our study is that the Corps has not made sufficient progress to improve the accuracy of its cost estimates, we could use those same government cost estimates to make industry competitiveness inferences. We concluded, however, that it is unclear whether statutory restrictions have affected competition in the hopper dredging industry. In reaching that conclusion, we analyzed a number of factors—including the number of companies with hopper dredges, the number of bidders and winning bid prices for Corps projects, and other factors such as environmental restrictions, the demand for nonfederal hopper dredging work, and differences in hopper dredge capabilities. We agree that obtaining reliable and up-to-date data are important for developing sound cost estimates, and our report recommends that the Corps develop a written plan for conducting a study to obtain and periodically update data on hopper dredging costs for its cost estimates.

DCA disagreed with our discussion on the capacity of the industry hopper dredge fleet, stating specifically that one industry dredge, the *Long Island*, should not have been included in our analysis because it had not been used for maintenance dredging and had not been used on a project for quite a few years. For our report, we did not limit our analysis to particular types of hopper dredging projects, such as maintenance projects, and we compared industry's total capacity today with what we reported in 2003, which we believe is a valid comparison. Moreover, in its comments on our 2003 report on hopper dredging, DCA included the *Long Island* in its list of industry dredges to support its point that industry hopper dredging capacity had increased in the decade leading up to 2003. As a result, we continue to believe it was appropriate to include the *Long Island* as a part of our analysis.

DCA stated our analysis of how the Corps' manages its hopper dredges was not comprehensive or objective and questioned why we did not

examine options for retiring or further reducing the use of Corps' dredges. DCA suggested that such an examination should take place and would be in line with the congressional intent of increasing the use of private industry dredges. However, DCA quotes selectively from the main statute that governs the Corps' hopper dredging activities.³⁵ While those portions of the law read in isolation could suggest that the Corps should take further steps to privatize its hopper dredge work, other provisions of the same law either (1) give the Corps broad discretion to implement its hopper dredge responsibilities or (2) directly restrict the Corps' ability to reduce or eliminate Corps' dredges. It was not the purpose of our report to examine policy options for carrying out the Corps' hopper dredge work, including those not presently authorized under statute. We did examine and discuss actions the Corps has taken or plans to take in managing its hopper dredges, which include, among other things, conducting a hopper dredge operating cost review and evaluating retirement or replacement options.

As agreed with your office, unless you publicly announce the contents of this report earlier, we plan no further distribution until 30 days from the report date. At that time, we will send copies to the Secretary of Defense, Chief of Engineers and Commanding General of the U.S. Army Corps of Engineers, and the appropriate congressional committees, and other interested parties. In addition, the report will be available at no charge on the GAO website at <http://www.gao.gov>.

If you or your staff members have any questions about this report, please contact me at (202) 512-3841 or fennella@gao.gov. Contact points for our Offices of Congressional Relations and Public Affairs may be found on the last page of this report. Key contributors to this report are listed in appendix V.

Sincerely yours,



Anne-Marie Fennell
Director, Natural Resources and Environment

³⁵33 U.S.C. § 622.

Appendix I: Objectives, Scope, and Methodology

This report examines (1) the actions the Corps has taken to address our 2003 recommendations for improving the information needed to manage its hopper dredging program and develop cost estimates for industry contracts; (2) the effects since 2003, if any, of the statutory restrictions placed on the use of the Corps' hopper dredges; and (3) key challenges, if any, the Corps faces in managing its hopper dredge fleet.

To conduct our work, we reviewed Pub. L. No. 95-269, which established the Corps' minimum fleet, the Water Resources Development Acts of 1996 and 2007, and other laws, regulations, and Corps' policy and guidance governing the Corps' use of hopper dredges. We interviewed officials from Corps headquarters, division offices, and the 9 Corps district offices with the largest hopper dredging workload during fiscal year 2003 through fiscal year 2012 (out of a total of 17 district offices that contracted with industry for hopper dredging work during the time period): Galveston, Jacksonville, Mobile, New Orleans, New York, Philadelphia, Portland, San Francisco, and Seattle. We also visited the Corps' four hopper dredges and one industry hopper dredge for informational tours of these vessels to gain a better understanding of their physical characteristics and operations. We interviewed representatives from the national association for the dredging industry, the Dredging Contractors of America, and the five dredging companies that own and operate hopper dredges—Cashman Dredging, Dutra Group, Great Lakes Dredge & Dock Company, Manson Construction Co., and Weeks Marine, Inc. We also interviewed other stakeholders involved in hopper dredging, including a national pilots' association and a national port authority association, and local pilots' associations and port authorities from the areas where Corps hopper dredges are stationed—New Orleans, LA; Philadelphia, PA; and Portland, OR. We focused our review on the 10-year period between fiscal year 2003—when we conducted our previous review of the Corps' hopper dredges¹—and fiscal year 2012—the most recent year for which Corps information on hopper dredging was readily available. In addition, we focused our review on the four hopper dredges in the Corps' minimum

¹[GAO-03-382](#).

dredge fleet during the period of our review: the *Essayons*, *McFarland*, *Wheeler*, and *Yaquina*, and did not include other dredge types.²

To examine the actions the Corps has taken to address our 2003 recommendations for improving the information needed to manage its hopper dredging program and develop cost estimates for industry contracts, we reviewed the Corps' process for tracking and analyzing data on solicitations for industry hopper dredging work, both at district offices and Corps headquarters. We also reviewed several sources of information the Corps maintains on the use of its hopper dredge fleet, including information maintained by the district offices responsible for operating the Corps' four hopper dredges, and the tracking log the Corps maintains with information on the urgent and emergency work its ready reserve vessels undertake. In addition, we reviewed the Corps' 2005 report to Congress on hopper dredges,³ other Corps studies and policy documents on the use of its hopper dredge fleet, and the information it uses to prepare hopper dredging cost estimates when soliciting bids by industry, including the engineering regulations and the computer program used to develop government cost estimates. We interviewed officials from the Corps' cost engineering center of expertise, who were responsible for developing cost estimating policies and software and officials from Corps district offices who were responsible for developing cost estimates for hopper dredging projects.

To examine the effects since 2003, if any, of the statutory restrictions placed on the use of the Corps' hopper dredges, we reviewed the statutes, regulations, and Corps' reports and other documents governing the use of the Corps' hopper dredge fleet. To assess changes in industry hopper dredging contracts since 2003, we reviewed and analyzed data from the Corps' Dredging Information System, the database it uses to maintain information on each of its dredging projects, including data on the type and location of the dredging work, the type of contract, and the

²We did not include the Corps' two "special purpose" hopper dredges—the *Currituck* and the *Murden*—because though these two vessels share some characteristics with the four larger hopper dredges, such as having hoppers and drag arms, they are substantially smaller than the rest of the Corps' or industry hopper dredge fleet. Specifically, the *Currituck* has a hopper capacity of 315 cubic yards, and the *Murden* has a hopper capacity of 512 cubic yards.

³U.S. Army Corps of Engineers, *Report to Congress: Hopper Dredges* (Washington, D.C.: June 3, 2005).

numbers of bids and bid prices for the contracts. To assess the reliability of the data, we interviewed officials from the Corps' Navigation Data Center who maintain the database, as well as officials from nine Corps district offices who are responsible for entering and updating data on their district offices' dredging activities. We reviewed documentation related to the database, such as the user's guide and data dictionary, and electronically tested the data for missing or erroneous values and, in several cases, obtained updated or corrected data from the Corps. We determined the data we used on the type and location of the dredging work, the type of contract, and the number of industry bids and bid prices for sealed-bid solicitations were sufficiently reliable for our purposes. We also analyzed financial data on the Corps' hopper dredges, including their operating and ownership costs, and income from ready reserve funding. To assess the reliability of the Corps' financial data, we interviewed Corps officials who maintain these data, compared the data to other sources of information on the Corps' hopper dredges, and obtained clarifying information from the Corps for certain items such as ready reserve funding. We determined the data were sufficiently reliable for our purposes. We obtained and reviewed information from the five dredging companies that own and operate hopper dredges, including information on their hopper dredges' capabilities, dredging work they performed, and changes to their hopper dredge fleet since 2003. We did not directly compare work performed by industry hopper dredges with work performed by the Corps' hopper dredges because, as we first reported in 2003, a direct and valid comparison of the Corps' and industry's costs to perform hopper dredge work is not possible due to various factors.⁴

To examine key challenges, if any, the Corps faces in managing its hopper dredge fleet, we reviewed Corps reports and financial data on its hopper dredge fleet, including a 2011 study on capital investment plans for its minimum fleet composition⁵ and a 2012 study of the fiscal condition

⁴GAO-03-382. These factors include, among other things, design features in the Corps' vessels in support of national defense missions, which add weight to the vessels and make them less efficient than industry vessels; limits to the number of days some of the Corps' vessels may operate; and differences between dredging projects—such as type of material dredged, type of work and corresponding risk level, and distance from the dredging operations to the placement site.

⁵Army Corps of Engineers, *Minimum Fleet Capital Investment Report, 2012-2061* (Washington, D.C.: Dec. 12, 2011; revised Apr. 26, 2013) and Army Corps of Engineers, *USACE Dredge Back to Black Plan* (Washington, D.C.: June 29, 2012).

of its hopper dredges. In addition to reviewing the 2012 fiscal study, we also obtained and analyzed additional data related to the financial condition of the Corps' hopper dredges. We also obtained and reviewed the Corps' 2012 and 2013 implementation memorandums related to both studies and discussed with Corps officials the actions the Corps has taken—and plans to take—related to the memorandums. We examined changes and potential challenges the Corps faces related to managing its hopper dredge fleet, including dredging accidents, repair delays, and potential funding changes. We discussed general Corps fleet management and composition options with industry officials and the other stakeholders we interviewed.

We conducted this performance audit from January 2013 to April 2014 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.

Appendix II: The U.S. Hopper Dredge Fleet

As of March 2014, 17 hopper dredges were operating in the United States, 13 of which were owned by industry (see table 4). In addition, 2 industry hopper dredges are expected to be added to the U.S. fleet by 2015.

Table 4: Corps and Industry Hopper Dredge Fleets, 2014

Owner	Vessel	Size ^a	Capacity (in cubic yards) ^b	Year built	Loaded draft (feet)
Cashman Dredging	<i>Atchafalaya</i>	Small	1,300	1980	14.7
Dutra Group	<i>Stuyvesant</i>	Large	9,870	1981	35.0
	<i>Columbia</i>	Medium	4,350	1986 ^c	16.5
Great Lakes Dredge & Dock Company	<i>Liberty Island</i>	Large	6,540	2002	28.3
	<i>Terrapin Island</i> ^d	Large	6,400	1981	22.3
	<i>Dodge Island</i>	Medium	3,600	1980	19.5
	<i>Padre Island</i>	Medium	3,600	1981	19.6
Manson Construction Co.	<i>Glenn Edwards</i>	Large	13,500	2006	28.0
	<i>Bayport</i>	Medium	4,855	1999	22.0
	<i>Newport</i>	Medium	4,000	1983	19.0
	<i>Westport</i>	Small	1,800	1978	11.0
Weeks Marine, Inc.	<i>R.N. Weeks</i>	Medium	4,000	1987	19.6
	<i>B.E. Lindholm</i>	Medium	4,000	1985	22.3
Corps	<i>Wheeler</i>	Large	8,256	1982	29.5
	<i>Essayons</i>	Large	6,852	1983	33.0
	<i>McFarland</i>	Medium	3,140	1967	23.1
	<i>Yaquina</i>	Small	1,042	1981	14.7
Hopper dredges planned					
Weeks Marine, Inc.	<i>Magdalen</i>	Large	8,500	Under construction; estimated completion late 2014 or early 2015	25.3
Great Lakes Dredge & Dock Company	New build	Large	15,000	Construction scheduled to begin in 2014; estimated completion 2015	29.0

Sources: U.S. Army Corps of Engineers and dredging industry.

^aA hopper dredge's size is determined by the capacity of its hopper—small hopper dredges have a capacity of up to 3,000 cubic yards, medium hopper dredges have a capacity of 3,001 to 6,000 cubic yards, and large hopper dredges have a capacity over 6,000 cubic yards.

^bThe capacities of several Corps and industry hopper dredges listed differ slightly from their capacities listed in our 2003 report. The capacities listed in this table are based on current information provided by the Corps and dredging companies.

^cThe *Columbia* was originally built in 1944 to transport military equipment in World War II, was later converted to a hopper dredge, and began its service as a hopper dredge in 1986, according to Corps documents.

^dThe *Terrapin Island* was formerly the *Eagle I*, owned by Bean Stuyvesant LLC. Great Lakes Dredge & Dock Company acquired and renamed the dredge in 2007.

Appendix III: Comments from the Department of Defense



DEPARTMENT OF THE ARMY
OFFICE OF THE ASSISTANT SECRETARY
CIVIL WORKS
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WASHINGTON DC 20310-0108
27 MAR 2014

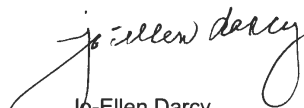
Ms. Anne-Marie Fennell
Director
Natural Resources and Environment
U.S. Government Accountability Office
441 G Street, NW
Washington, DC 20548

Ms. Fennell:

This is the Department of Defense response to the GAO Draft Report, GAO-14-290, "ARMY CORPS OF ENGINEERS: Actions Needed to Further Improve Management of Hopper Dredging," dated February 24, 2014 (GAO Code 361469).

The Department concurs with the two recommendations in the GAO report, and will be taking steps to address these recommendations. The Department appreciates this opportunity to address the GAO recommendations for improving the management of hopper dredging.

Very truly yours,


Jo-Ellen Darcy
Assistant Secretary of the Army
(Civil Works)

Enclosure



GAO DRAFT REPORT DATED FEBRUARY 24, 2014
GAO-14-290 (GAO CODE 361469)

“ARMY CORPS OF ENGINEERS: Actions Needed to Further Improve
Management of Hopper Dredging”

DEPARTMENT OF DEFENSE COMMENTS
TO THE GAO RECOMMENDATION

RECOMMENDATION 1: The GAO recommends that the Secretary of Defense direct the Corps of Engineers to provide written direction to its district offices on the importance of and need to accurately and consistently populate the data files in its Dredging Information System database, including solicitations that receive no bids or where all the bids received exceed the Corps Government Estimate by more than 25 percent.

DoD RESPONSE: Concur. Pending receipt of GAO’s final recommendations, USACE Headquarters will issue a letter to the districts reinforcing previous direction to provide accurate and timely information in the Dredging Information System database, including solicitations that receive no bids or where all the bids received exceed the Corps Government Estimate by more than 25 percent.

RECOMMENDATION 2: The GAO recommends that the Secretary of Defense direct the Corps of Engineers to develop a written plan for conducting a study to obtain and periodically update data on hopper dredging costs for its cost estimates, including reliable data on industry hopper dredge equipment and labor rates.

DoD RESPONSE: Concur. The USACE will develop a written plan as resources allow.

Appendix IV: Comments from the Dredging Contractors of America

Note: GAO comments supplementing those in the report text appear at the end of this appendix.



March 11, 2014

Ms. Anne-Marie Fennell
Director, Natural Resources and Environment
U.S. Government Accountability Office
441 G Street, NW
Washington, DC 20548

Dear Ms. Fennell:

Attached are the official comments of the Dredging Contractors of America (DCA) to the proposed Government Accountability Office (GAO) report entitled Army Corps of Engineers Actions Needed to Further Improve Management of Hopper Dredging (GAO-14-290). DCA appreciates the opportunity to respond to this report. The information and results of this effort will be significant to the future of the DCA hopper dredging members and the Corps of Engineers (Corps).

DCA is a non-profit organization representing the nation's dredging and marine construction contractors. DCA members include the five companies that provide hopper dredging services to the Corps.

Thank you for the cooperation of the Government Accountability Office in developing this report. Please direct all questions that you may have regarding DCA comments to me at (202) 737-2674.

Sincerely,

A handwritten signature in black ink, appearing to read "Barry W. Holliday".

Barry W. Holliday
Executive Director

Dredging Contractors of America
503 D Street, NW, Washington DC 20001



The Dredging Contractors of America (DCA) appreciates the opportunity to offer written comments on the draft Government Accountability Office (GAO) report entitled *Army Corps of Engineers: Actions Needed to Further Improve Management of Hopper Dredging (GAO-14-290)*. DCA offers the following comments and supporting information:

In Appendix I: Objectives, Scope, and Methodology, GAO describes how they went about this study, including what they did and what they did not do. On page 34, is the following statement: "We did not directly compare work performed by industry hopper dredges to work performed by the Corps' hopper dredges because, as we reported in 2003, a direct and valid comparison of the Corps' and industry's costs to perform hopper dredge work is not possible due to various factors." DCA respectfully disagrees, and with the assistance of a third-party consultant has performed an analysis of the costs of the Corps hopper dredges and industry hopper dredges performing similar work. As we state below, our analysis clearly demonstrates that industry dredges can work for significantly less than Corps dredges. To continue to work Corps hopper dredges at all, much less increase work for these dredges, results in increased costs to the taxpayers of the United States. In light of the results of our study, GAO's statement that, "Since 2003, statutory restrictions on the use of the Corps hopper dredges have resulted in additional costs..." is not accurate.

Mississippi River Savings

In the Mississippi River, where the Corps ready reserve hopper dredge *Wheeler* is stationed and performs its training days, there were numerous industry hopper dredge contracts to develop a comprehensive comparison of similar hopper dredging. This comparison was further supported by using Corps data on the various hopper dredge pumping rates of the individual industry hopper dredges and the *Wheeler* (see appendix 1). Based on this comparison, it was determined that industry can perform the work of the *Wheeler* at an average annual cost savings of \$16 million.

East Coast Savings

On the East Coast, the Corps ready reserve hopper dredge *McFarland*, is used for readiness 70 training days in the Delaware Bay with an average annual cost of \$16 million. A comparable industry dredge can dredge this 70 days at a cost of \$3.7 million, for an average annual savings of \$12 million (see appendix 2).

West Coast Savings

On the West Coast, DCA compared the 2008 regional contract that was procured when the Corps hopper dredge *Essayons* was being repowered. The contractor removed 9.5 million cubic yards (mcy) for a total cost of \$23.6 million (see appendix 3). The *Essayons* average annual cost is \$25.4 million for removal of an average of 6.7 mcy, and an annual industry contract is procured for additional west coast dredging needs averaging \$8.1 million to dredge 3.4 mcy. The total cost of the *Essayons* dredging and

See comment 1.

See comment 2.



the annual industry contract equals \$33.5 million, compared to the \$23.6 million for the regional contract, or a savings of \$9.9 million if industry does all the *Essayons* West Coast hopper dredging. This does not include any potential savings if industry were to home port a dredge on the West Coast.

GAO, in paragraph 3 of the Executive Summary, discusses the two challenges facing the Corps "in managing its hopper dredge fleet" as (1) ensuring the fiscal sustainability of its hopper dredges, and (2) determining the fleet's appropriate future composition." GAO acknowledged that the Corps has had difficulty addressing these challenges. The total annual savings that could be realized by industry performing the work of the *Wheeler*, *McFarland*, and *Essayons* is approximately \$38 million, a substantial cost savings to the taxpayer. With the potential cost savings shown above, and the fact that the DCA hopper capacity will be increasing by 34 percent within the next two years, there should be a clear path forward to reduce the Corps hopper dredge fleet. DCA respectfully requests that GAO evaluate these potential cost savings and additional potential cost savings that could be realized from vessel retirements or alternative ready reserve methods.

See comment 3.

Database Shortcomings

GAO states that they have examined the actions the Corps has taken since the 2003 GAO report on hopper dredges with respect to the recommendations made regarding improvements to the information needed to manage the Corps hopper dredging program and develop cost estimates for industry contracts. DCA continues to support the use of updated hopper dredging cost data for developing their cost estimates. DCA continues to be frustrated that the Corps does not provide an accurate and complete database to effectively manage the Corps hopper dredging program. DCA has identified numerous omissions and inaccuracies in the Dredging Information System (DIS) for both the Corps hopper dredges and the industry contract data. DCA agrees that the Corps should improve the information for characterizing urgent and emergency dredging actions and results. However, DCA does not know of any emergencies, as defined by the FAR, being declared over the past ten years that would require call out of a Corps hopper dredge.

See comment 4.

See comment 5.

Government Estimates

On page 15, paragraph 2, GAO states, "Since 2003, statutory restrictions on the use of the Corps hopper dredges have resulted in additional costs, but it is unclear whether the restrictions have affected competition in the hopper dredging industry." DCA is concerned that GAO repeatedly comments on the lack of evidence of increased competition based solely on the number of bidders and winning prices for Corps hopper dredging projects. With the introduction of Multiple Award Task Order Contracting (MATOC) as a procurement method in some districts, the Corps no longer reveals the number of bidders or the Government Estimate (GE) for these task order contracts. This distorts any analysis of the number of bidders, and without the GE, there is no means to evaluate how the GE compares to industry bids. Moreover, GAO indicates that the Corps has made unsatisfactory progress since 2003 in

See comment 4 and 6.

See comment 7.



addressing its need for updated industry cost information in order to produce more accurate GEs, but then relies heavily on a comparison of industry bids to those same potentially inaccurate GEs in its analysis, leading to inaccurate conclusions with respect to industry competitiveness. If one of the fundamental conclusions of this study is that the Corps has not made sufficient progress to improve the accuracy of its cost estimates, how can those same GEs be used to make industry competitiveness inferences?

Industry Capacity

As the GAO report shows, the amount of work for hopper dredges has remained relatively flat since 2003. DCA agrees that this is the reality. The restrained Corps budgets and year-long Continuing Resolutions offer little incentive to increase the number of hopper dredges. As GAO points out, with the Southeast projects required to be dredged during the winter months due to sea turtle concerns, and that most East Coast beach nourishment is required to be done during the winter months, certain seasons of the year experience peak workload demand for the hopper dredges.

See comment 8.

DCA hopper dredge companies have sufficient capacity for the current dredge market, and two additional large capacity hopper dredges are being currently constructed. DCA does not agree with the discussion on capacity of the industry fleet. The 16,000 cubic yard hopper dredge *Long Island* was not used for maintenance dredging, had not been used on a project for quite a few years, and should not be included in the capacity analysis. The other three dredges were removed from the U.S. market because of a lack of work, not because of overseas demand. The purchase of the *Stuyvesant* by a U.S. dredging company ensures that this large hopper dredge will remain in the U. S. and not be periodically out of U.S., as in the past. When the two new large hopper dredges are launched there will be a 34% increase in industry hopper capacity.

See comment 9.

DCA considers the Corps dredges *Currituck* and *Murden* to be small-class hopper dredges and both should have been evaluated in this GAO study of Corps hopper dredges. The *Currituck* has been categorized as a special purpose dredge and previously left out of Corps minimum fleet discussions. However, it has become a concern for the dredging industry regarding the Corps dredging in projects that have historically been accomplished with industry dredges. The *Murden* is the newest Corps hopper dredge, with a hopper capacity of 500 cubic yards, and has already been performing dredging in projects historically accomplished by industry dredges.

See comment 10.

Ready Reserve or Retirement of Corps Dredges

In paragraph 3, of the Executive Summary, GAO discusses the two challenges facing the Corps "in managing its hopper dredge fleet" as "(1) ensuring the fiscal sustainability of its hopper dredges, and (2) determining the fleet's appropriate future composition." DCA does not consider the GAO analysis of how the Corps manages its hopper dredges to be comprehensive or objective. It appears to support a



See comment 3.

status quo position that must ensure the fiscal sustainability of the Corps hopper dredges. This is not in the best interest of the taxpayer. As GAO acknowledges in the draft report, Congress enacted legislation that places restrictions on Corps hopper dredges to further encourage the Corps to contract with private industry for hopper dredging. DCA questions why GAO did not address retiring aging Corps vessels. The Corps has elected to invest millions of dollars to upgrade these dredges and now declares them too expensive to not operate more. In fact, because the *Wheeler* costs have dramatically increased, and the vessel is still operating in the red, the Corps is considering increasing the daily rate even more, operating the dredge more training days (which is counter to the WRDA Section 237 requirement to operate only the minimum training days), and is seeking additional appropriations for the project to pay for this dredge's costs. This is throwing good money after bad!

See comment 11.

See comment 12.

DCA questions why GAO did not look at alternative Ready Reserve methodologies, including using industry dredges in a ready reserve mode. According to a recent study (Navigistics Consultants, 2014), "the U.S. Navy's Military Sealift Command (MSC) is the leading provider of ocean transportation for the Department of Defense (DOD) and operates the Navy's non-combatant supply ships, such as the Large Medium Speed Roll-On/Roll-Off (RO-ROs) or LMSRs." The MSC uses private commercial managers to man and operate many of its owned auxiliary vessels in a ready reserve/reduced operating mode. The operating contract rates for keeping these vessels in a reduced operating status, that requires these vessels to be fully crewed and operational within four days, realize average reductions in daily operating costs ranging from almost 60% to 68%. Based on these costs in comparison to the LMSR contracts, it seems clear that the Corps is not utilizing ready reserve status to the same extent as the MSC. Even if you look at the least potential savings at 60% for the Navy LMSRs, the cost savings could be substantial for the Corps hopper dredges *Wheeler* and *McFarland*. If you just consider the operating costs and repair costs, and apply this potential 60% savings, the annual savings could be almost \$20 million, according to the Navigistics Study.

See comment 13.

On page 16, in the GAO draft report Section entitled *Statutory Restrictions Have Resulted in Additional Costs for Corps Hopper Dredging*, GAO again appears to be focused on impacts to the Corps dredges rather than acknowledging that Congress has legislated the *Wheeler* and *McFarland* to be in Ready Reserve (as fire engines) and they have been willing to fund the two Corps dredges to be ready to respond to the unforeseen requirements. While GAO acknowledges that many of the costs of these two Corps ready reserve hopper dredges are incurred "regardless of how much the dredges are used", there is no mention or recommendation of alternatives in crewing and other costs that might reduce the substantially higher rates these dredges require to operate. To say that, "in the case of the *Wheeler*, the limited dredging days since being placed in ready reserve have contributed to higher daily rates", is very misleading, and DCA strongly disagrees with this conclusion. The decisions to replace the engines on the *Wheeler* and maintain full time crews, and changes in the financial accounting have substantially increased the cost of this dredge. Certainly, you could increase the dredging days and theoretically it should bring down the daily rate, but the fixed costs are so high, any reductions would be marginal if at

See comment 14.



all. In fact, the Corps hopper dredge *Essayons*, operating on the West Coast with no restrictions, has substantially increased their annual costs and daily rate since becoming totally unrestricted.

See comment 15.

On page 11, within the Section of the GAO draft report entitled *The Corps Collects Recommended Data on Urgent or Emergency Dredging but Does Not Consistently Collect Data on Certain Solicitations*, there are several troublesome issues. It appears that GAO disregards the basic Congressional tenet of Section 237 of WRDA 1996 – “*The Secretary shall initiate a program to increase the use of private-industry hopper dredges for the construction and maintenance of Federal navigation channels.*” GAO appears to be encouraging the Corps to collect more solicitation information to enhance the opportunities for the Corps hopper dredges to be used more. And, in fact, GAO states “*Without complete data on no-bid and high-bid solicitations, the Corps may be missing opportunities to plan future hopper dredging work that identifies and addresses potential gaps in industry’s ability to fulfill certain dredging needs based on this solicitation information.*” DCA contends that this comment completely contradicts the intent of Congress, and the Corps should be learning how to better manage full use of the industry hopper dredges, not the Corps dredges. The example GAO raises, an urgent hopper dredging job in North Carolina in January 2013, is an example of how the Corps is not properly seeking ways to increase the use of industry hopper dredges for urgent requirements. The district did not seek to reduce the scope of the dredging job for industry to be bid, but cancelled the original procurement. Instead the Corps ready reserve hopper dredge *McFarland* was mobilized at enormous expense. The *McFarland* dredged for 30 days and only removed approximately 125,000 cubic yards of material, and the channel was not restored to project depth. A similar size industry dredge could have removed this quantity of material in less than 12 days, and a substantially reduced cost. There was no attempt to “Use Industry First” and the Corps did not comply with Section 237 of WRDA 1996 which states – “*The Secretary shall develop and implement procedures to ensure that, to the maximum extent practicable, private industry hopper dredge capacity is available to meet both routine and time-sensitive dredging needs.*”

See comment 16.

The following are GAO's comments on the letter from the Dredging Contractors of America dated March 11, 2014.

1. We believe that various factors prohibit a direct and valid comparison of the Corps' and industry's costs to perform hopper dredge work including: (1) design features in the Corps' vessels in support of national defense missions, which add weight to the vessels and make them less efficient than industry dredges; (2) limits to the number of days some of the Corps' vessels may operate; and (3) differences between dredging projects—such as type of material dredged, type of work, corresponding risk level, and distance from the dredging operations to the placement site. In providing its estimates of cost savings for industry dredging, DCA provided no information indicating how or whether its third-party consultant took such factors into account. DCA also did not provide enough information on the consultant's analysis for us to be able to determine how it reached its conclusions that industry dredges can work for less than Corps dredges. Based on our work, we continue to believe, as we state in our report, that since 2003, statutory restrictions on the use of Corps' hopper dredges have resulted in additional costs to the Corps.
2. DCA referred to three appendixes in their written comments. These appendixes included Excel spreadsheets with various dredging data. We did not reprint these spreadsheets with DCA's written comments.
3. It was not the purpose of our report to evaluate policy options for carrying out the Corps' hopper dredge work, including those not presently authorized by law, such as vessel retirements or alternative ready reserve methods. The Corps' authority to retire its hopper dredges or reduce their workload is limited by statute, and DCA did not indicate why it believes retirements would be consistent with existing law. According to statute, the Corps "may not further reduce the readiness status of any Federal hopper dredge below a ready reserve status except any vessel placed in such status for not less than 5 years that the Secretary determines has not been used sufficiently to justify retaining the vessel in such status."¹ The Corps has made no such determination. In addition, the Corps may "not reduce the availability and utilization of Federal hopper dredge vessels stationed on the Pacific and Atlantic coasts below that which occurred in fiscal year 1996 to meet the navigation dredging needs of the

¹33 U.S.C. § 622(c)(7)(A).

ports on those coasts."² In the Water Resources and Development Act of 2007, Congress directed the Corps to place the *McFarland* in ready reserve.³ But even assuming this provision implicitly repealed the prior statute as applied to the *McFarland*, the Water Resources and Development Act of 2007 provided that the *McFarland* must be maintained in a "ready reserve fully operational condition." Similarly, the law requires the *Wheeler* to be maintained in a "fully operational condition."⁴ Furthermore, the law assigns to the Corps the responsibility for carrying out hopper dredge work "in the manner most economical and advantageous to the United States."⁵ This language "evidences congressional intent to confer on the Army Corps wide discretion in matters relating to its dredging activities."⁶

4. We used only the Dredging Information System data that we determined were sufficiently reliable for our purposes. Specifically, as noted in our report, we used data on the type and location of dredging work, the type of contract, and the number of industry bids and bid prices for sealed-bid solicitations. DCA stated that, with the introduction of Multiple Award Task Order Contracting, our analysis of the number of bidders and bid prices may be distorted. As noted in our report, however, we limited our analysis to awarded, sealed-bid solicitations for which the Corps had reliable data on the numbers of bids and bid prices, and we did not include the procurement method mentioned by DCA. Our analysis of the Dredging Information System data indicates that about 76 percent of hopper dredging contracts awarded by the Corps from fiscal year 2003 through fiscal year 2012 (and about 89 percent of hopper dredging contracts awarded in fiscal year 2012 alone) were awarded through the sealed-bid process.

5. In characterizing urgent and emergency work in our report, we relied on the definitions outlined in the Corps' raise the flag procedure, which we believe was the appropriate way to define and report on how the Corps

²33 U.S.C. § 622(c)(7)(C).

³Pub. L. No. 110-114, § 2047, 121 Stat. 1105.

⁴33 U.S.C. § 622(c)(3).

⁵33 U.S.C. § 622(a).

⁶Northlight Harbor LLC v. United States, 561 F.Supp.2d 517, 523 (D.N.J. 2008).

collects and tracks the urgent or emergency work its hopper dredges carry out. Corps data show that urgent and emergency work have occurred from fiscal year 2003 through fiscal year 2012 as we state in our report.

6. We did not comment on the lack of evidence of increased competition based solely on the number of bidders and winning bid prices for Corps hopper dredging projects. Rather, we reached our conclusion—that it is unclear whether statutory restrictions have affected competition in the hopper dredging industry— after analyzing a number of factors, including the number of companies with hopper dredges, the number of bidders and winning bid prices for Corps projects, and other factors such as environmental restrictions, the Corps' efforts to better coordinate dredging activities, demand for nonfederal hopper dredging work, and differences in hopper dredge capabilities. See also comment 4.

7. We did not make industry competitiveness inferences based on the Corps' cost estimates alone, see comment 6. We agree that obtaining reliable and up-to-date data are important for developing sound cost estimates, and our report recommends that the Corps develop a written plan for conducting a study to obtain and periodically update data on hopper dredging costs for its cost estimates.

8. We included the industry hopper dredge *Long Island* as available hopper dredge capacity in 2003, based on information provided by the Corps and DCA. In official comments on our 2003 report on hopper dredging, DCA included the *Long Island* in its list of industry dredges to support the point that industry hopper dredging capacity had increased in the decade leading up to 2003. This dredge was since removed from the U.S. market and, therefore, we factored its removal in our calculation of the change in overall industry capacity since 2003. We included all hopper dredging projects in our analysis and did not limit our analysis to maintenance projects. In addition, we did not examine use, but rather industry capacity.

9. During interviews with the industry representatives who owned the dredges that were removed from the U.S. market, we were told that the dredges were moved overseas, in part, because of increasing demand for hopper dredges by foreign governments, and, that the dredges have performed work overseas, indicating overseas demand. We also recognize a lack of work in the United States may have also been a factor in the relocation of these dredges, and we have added text to our report to note this.

10. We used the Corps' definition of its minimum hopper dredge fleet in determining the scope of our review. The law establishing the minimum fleet gave the Corps discretion to determine the fleet's size and composition.⁷ In addition, the capacity of the four Corps' hopper dredges ranges from about 1,050 cubic yards to about 8,300 cubic yards, which is similar to the private industry hopper dredges' capacity, which ranges from 1,300 cubic yards to 13,500 cubic yards. In contrast, the *Murden* and *Currituck*'s total capacity is 512 and 315 cubic yards, respectively, making them significantly smaller dredges than the hopper dredges in the Corps' and private industry's fleet. Moreover, the *Murden* was commissioned into active duty in May 2013, and it was, therefore, not part of the Corps' fleet during the period of our review, from fiscal year 2003 through fiscal year 2012.

11. The law makes no reference to "training days" and does not impose a specific cap on the number of days for which the *Wheeler* may operate. The Corps has, as a matter of practice, scheduled training work for the *Wheeler* in order to "periodically perform routine tests of the equipment of the vessel to ensure the vessel's ability to perform emergency work."⁸

12. An examination of using industry dredges in a ready reserve mode was beyond the scope of this review.

13. In our report, we make frequent references to the fact that legislation placed the *Wheeler* and the *McFarland* in ready reserve, and we provide funding information for the Corps' dredging program, including the specific funding to support the *Wheeler* and *McFarland* in their ready reserve status. We did not identify alternatives for how the Corps might reduce the costs to operate these vessels, but we did examine and discuss actions the Corps has taken or plans to take in managing its hopper fleet, which include, among other things, conducting a hopper dredge operating cost review and evaluating retirement or replacement options.

⁷The law provides that the Secretary of the Army, acting through the Corps, "may retain so much of the federally owned fleet as he determines necessary, for so long as he determines necessary, to insure the capability of the Federal Government and private industry together to carry out projects for improvements of rivers and harbors" (33 U.S.C. § 622(b) (emphasis added)).

⁸33 U.S.C. § 622(c)(3).

14. The way that hopper dredges recover their costs is by actively dredging, and, fewer days of work will equate to higher rates when work is performed because of the fewer days available to spread out costs. As noted in our report, daily rates for Corps hopper dredges have increased and may continue to increase due to several factors such as increasing fuel costs and changes in Corps accounting methods, in addition to ready reserve restrictions on two of the dredges. We did not quantify the extent to which individual factors contributed to increases in daily rates, rather we report that restrictions on the number of days ready reserve hopper dredges can work have contributed to increases in their daily rates. We agree that the *Essayons*, operating on the West Coast with no restrictions, has increased its annual costs and daily rates since becoming unrestricted. However, we found that the increase in the *Essayons* daily rate from \$95,000 in fiscal year 2008—the last year in which it was restricted—to \$100,000 in fiscal year 2012 was substantially smaller than that of the *Wheeler*, with a daily rate increase from \$95,000 to \$140,000 over the same period.

15. We agree that one basic congressional tenet of the Water Resources Development Act of 1996 was to increase the use of private industry hopper dredges but, as we have noted, the law also directly restricts the Corps' ability to reduce the use of or eliminate Corps' dredges. See comment 3. We do not agree that collecting more solicitation information would result in enhanced opportunities for the Corps' hopper dredges to be used more. Rather, we believe that in collecting this solicitation information, the Corps may be able to better plan for future hopper dredging work, whether done by industry dredges or Corps dredges.

16. Based on our review of Corps' documentation related to the example cited, we found that industry was provided several opportunities to bid on the work. Specifically, after soliciting bids for the work and receiving only one bid, which was more than 25 percent above the government cost estimate, the Corps reviewed its cost estimate, found it to be reasonable, and began negotiations with the company that had submitted the bid. The parties were unable to agree on a price for the work, however, so the Corps then provided a second notification to industry, indicating that there was an urgent need for dredging. According to Corps documentation, no dredging company expressed both the availability and the capability to address the dredging need and, therefore, the Corps used one of its own dredges to complete the work.

Appendix V: GAO Contact and Staff Acknowledgments

GAO Contact

Anne-Marie Fennell, (202) 512-3841 or fennella@gao.gov

Staff Acknowledgments

In addition to the individual listed above, Alyssa M. Hundrup, Assistant Director; Hiwotte Amare; John Delicath; Cindy Gilbert; Miles Ingram; Richard P. Johnson; Delwen Jones; Kirk D. Menard; Samuel Morris; Mehrzad Nadji; Dan Royer; and Tatiana T. Winger made key contributions to this report.

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