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GAO

Report to Congressional Committees

March 2003

CORPS OF ENGINEERS

Effects of Restrictions on Corps' Hopper Dredges Should Be Comprehensively Analyzed

GAO-03-382

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GAO Accountability • Integrity • Reliability

Highlights

Highlights of GAO-03-382, a report to Congressional Committees

Why GAO Did This Study

The fiscal year 2002 Conference Report for the Energy and Water Development Appropriations Act directed GAO to study the benefits and effects of the U.S. Army Corps of Engineers' (Corps) dredge fleet. GAO examined the characteristics and changing roles of the Corps and industry in hopper dredging; the effect of current restrictions on the Corps' hopper dredge fleet; and whether existing and proposed restrictions on the fleet, including the proposal to place the *McFarland* in ready reserve, are justified. In addition, GAO identified concerns related to the government cost estimates the Corps prepares to determine the reasonableness of industry bids.

What GAO Recommends

GAO recommends that the Secretary of the Army direct the Corps of Engineers to (1) obtain and analyze baseline data to determine the appropriate use of the Corps' hopper dredge fleet, (2) prepare a comprehensive analysis of the costs and benefits of existing and proposed restrictions on the use of the Corps' hopper dredge fleet, and (3) assess the data and procedures used to prepare the government cost estimate. The Department of the Army agreed with GAO's recommendations. The Dredging Contractors of America generally agreed with GAO's recommendations, but strongly disagreed that restrictions on the Corps' hopper dredges have not resulted in proven benefits.

www.gao.gov/cgi-bin/getrpt?GAO-03-382.

To view the full report, including the scope and methodology, click on the link above. For more information, contact Barry T. Hill at (202) 512-3841 or hillbt@gao.gov.

What GAO Found

In response to 1978 legislation that encouraged private industry participation in dredging, the Corps gradually reduced its hopper dredge fleet from 14 to 4 vessels (the *Wheeler*, the *McFarland*, the *Essayons*, and the *Yaquina*) while a private hopper dredging industry of five firms and 16 vessels has emerged. Dredging stakeholders generally agreed that the Corps needs to retain at least a small hopper dredge fleet to (1) provide additional dredging capacity during peak demand years, (2) meet emergency dredging needs, and (3) provide an alternative work option when industry provides no bids or when its bids exceed the government cost estimate by more than 25 percent. In reviewing the cost estimation process, GAO found that the Corps' estimates are based on some outdated contractor cost information and an expired policy for calculating transit costs.

The restrictions on the use of the Corps' hopper dredge fleet that began in fiscal year 1993 have imposed costs on the Corps' dredging program, but have thus far not resulted in proven benefits. The Corps estimates that it spends $12.5 million annually to maintain the *Wheeler* in ready reserve, defined as 55 workdays plus emergencies, of which about $8.4 million is needed to cover the costs incurred when the vessel is idle. A possible benefit of restrictions on the Corps' vessels is that they could eventually encourage existing firms to add dredging capacity or more firms to enter the market, which, in turn, may promote competition, improve dredging efficiency, and lower prices. Although there has been an increase in the number of private industry hopper dredges since the restrictions were first imposed, the number of private firms in the hopper dredging market has decreased. In addition, during the same time period, the number of contractor bids per Corps solicitation has decreased, while the number of winning bids exceeding the Corps' cost estimates has increased.

Although the Corps proposed that the *McFarland* be placed in ready reserve, it has not conducted an analysis to establish that this action would be in the government's best interest. Specifically, in a June 2000 report to the Congress, the Corps stated that the placement of the *Wheeler* in ready reserve had been a success and proposed that the *McFarland* also be placed in ready reserve. However, when asked, the Corps could not provide any supporting documentation for its report. Furthermore, according to the Corps, future use of the *McFarland* will require at least a $25 million capital investment to ensure its safety, operational reliability, and effectiveness. Such an investment in a vessel that would be placed in ready reserve and receive only minimal use is questionable.

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Abbreviations

Army	Department of the Army
Corps	U.S. Army Corps of Engineers
DCA	Dredging Contractors of America
GAO	General Accounting Office

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Accountability * Integrity * Reliability

United States General Accounting Office
Washington, DC 20548

March 31, 2003

The Honorable Ted Stevens
Chairman
The Honorable Robert C. Byrd
Ranking Minority Member
Committee on Appropriations
United States Senate

The Honorable James M. Inhofe
Chairman
The Honorable James M. Jeffords
Ranking Minority Member
Committee on Environment and Public Works
United States Senate

The Honorable C.W. Bill Young
Chairman
The Honorable David R. Obey
Ranking Minority Member
Committee on Appropriations
House of Representatives

The Honorable Don Young
Chairman
The Honorable James L. Oberstar
Ranking Democratic Member
Committee on Transportation and Infrastructure
House of Representatives

Keeping the nation's navigation channels and ports fully functioning is vital to U.S. commerce both domestically and abroad. In 2001, shipping vessels moved more than $700 billion of import and export cargo through the nation's ports and harbors. Vessels called dredges remove sediment from the bottom of navigation channels, ports, and harbors to maintain waterways at the navigable depths and widths necessary for shipping. There is a variety of dredge types, each designed to perform optimally under specific conditions. One dredge type—the hopper dredge—performs much of the dredging needed in ports, harbors, and access channels exposed to the ocean, where traffic and operating conditions render the use of other dredges inefficient or impractical. A hopper

dredge pumps material (e.g., sand and water slurry) into its hopper where it is stored before being transported to the disposal site. (See fig. 1.)

Figure 1: Hopper Dredge

Source: U.S. Army Corps of Engineers.

The U.S. Army Corps of Engineers (Corps) is responsible for dredging U.S. ports and harbors. The Corps is to carry out projects for improvements of rivers and harbors, by contract or otherwise, in the manner most economical and advantageous to the United States. Until 1978, the Corps performed all hopper dredging work with its 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 fleet as industry demonstrated its ability to perform, and (3) maintain a minimum fleet of federal vessels for emergency and national defense purposes. The act also directed the Corps to retain as much of the fleet as it determined necessary to ensure that the federal and private fleets together could carry out necessary dredging projects. As a result, the Corps reduced the size of its hopper dredge fleet to four vessels—the *Wheeler*, the *McFarland*, the *Essayons*, and the *Yaquina*. In the 1990s, in an effort to further promote private industry participation in hopper dredging, the Congress imposed restrictions on the Corps' hopper dredge fleet. These restrictions (1) effectively reduced the annual work schedule of each of the Corps' hopper dredges from about 230 to about 180 workdays and (2) limited the *Wheeler* to 55 workdays per year plus emergencies (referred to as "ready reserve" status). Furthermore, in fiscal year 2002, the Congress directed the Corps to confine the *McFarland* to emergency work and operations in the Delaware River. The Corps was to periodically evaluate the effects of the ready reserve program on the costs, responsiveness, and capacity of the Corps' and private industry's hopper dredges.

The fiscal year 2002 Conference Report for the Energy and Water Development Appropriations Act directed GAO to study the benefits and effects of the Corps' dredge fleet. In response, we examined (1) the changing roles of the Corps and industry in hopper dredging and the characteristics of the hopper dredging industry; (2) the effect of restrictions currently in place on the Corps' hopper dredge fleet; and (3) whether the existing and proposed restrictions on the Corps' hopper dredges, including placing the dredge *McFarland* in ready reserve, are justified. In addition, during the course of our work we identified concerns related to the government cost estimates that the Corps prepares to determine whether industry bids for dredging work are reasonable.

Results in Brief

In accordance with legislative direction, the Corps has reduced its hopper dredge fleet, while the private hopper dredging industry has steadily increased its share of the annual hopper dredging workload. Today, of the 20 hopper dredges in service in the United States, five private industry firms operate 16 vessels and perform about 72 percent of the nation's hopper dredging maintenance work, while the Corps operates 4 vessels and performs the remaining 28 percent of the work. Corps officials and representatives from the dredging industry, selected ports, and the maritime industry generally agreed that the Corps needs to retain a hopper dredge fleet to (1) provide additional dredging capacity during peak

demand years, (2) meet the emergency and national defense needs identified in the 1978 legislation, and (3) provide an alternative work option at times when industry offers unreasonable bids or no bids at all. To determine the reasonableness of private contractor bids, the Corps develops a government cost estimate that serves as a benchmark against which industry bids are compared. If the bids exceed the government estimate by more than 25 percent, the Corps may elect to perform the work itself.

During our review, we identified a number of concerns regarding the Corps' government cost estimate. Specifically, the Corps uses outdated industry cost data to determine the reasonableness of contractor bids when developing its cost estimate. In addition, the Corps continues to follow a policy that expired in 1994 when calculating contractor transit costs to the dredging site for some of its contracts. These concerns raise questions about the practical value of using the Corps' cost estimate as protection against high industry bids.

Restrictions on the use of the Corps' hopper dredge fleet, which began in fiscal year 1993, have imposed costs on the Corps' dredging program, but have thus far not resulted in proven benefits. Most of the costs of the Corps' hopper dredges are incurred regardless of how frequently the dredges are used. For example, the Corps' placement of the *Wheeler* in ready reserve—55 annual workdays plus emergencies—reduced the vessel's productivity by 56 percent but reduced costs by only 20 percent. The Corps estimates that it spends $12.5 million annually to maintain the *Wheeler* in ready reserve, of which approximately $8.4 million is needed to cover the costs incurred when the vessel is idle. A possible benefit of restrictions on the Corps' vessels is that they could eventually encourage existing firms to add dredging capacity or more firms to enter the market, which, in turn, may promote more competition, improve dredging efficiency, and lower prices. Although there has been an increase in the number of private industry hopper dredges since the restrictions were first imposed, the number of private firms in the hopper dredging market has decreased. In addition, during the same time period, the number of contractor bids per Corps solicitation has decreased, while the number of winning bids exceeding the Corps' cost estimate has increased. Another potential benefit of the restrictions is enhanced Corps responsiveness to emergency dredging needs. However, the Corps is unable to evaluate whether emergency dredging needs have been met more or less efficiently since the restrictions went into effect because it does not specifically identify and track emergency work performed by either Corps or industry vessels.

In a June 2000 report to the Congress, the Corps stated that the placement of the *Wheeler* in ready reserve had been a success and recommended that the vessel remain in ready reserve. However, the report contained a number of analytical and evidentiary shortcomings, and, when asked, the Corps could not provide any supporting documentation for its recommendation. In addition, the report also proposed that the *McFarland* be placed in ready reserve, but the Corps did not conduct an analysis to support this proposal. Furthermore, according to the Corps, the *McFarland* will require at least a $25 million capital investment to ensure its safety, operational reliability, and effectiveness for future service. It is questionable whether such an investment in a vessel that would be placed in ready reserve and receive only minimal use is in the best interest of the government.

We are making recommendations to the Secretary of the Army regarding the need to comprehensively analyze the costs and benefits of existing and proposed restrictions on the use of the Corps' hopper dredge fleet and to update the information and methodology that the Corps uses for its hopper dredging cost estimates. In commenting on a draft of this report, the Department of the Army agreed with all the recommendations and provided time frames for implementing each of them. The Dredging Contractors of America generally agreed with our recommendations, but strongly disagreed that the benefits of the restrictions are unproven.

Background

Since 1824 the Corps has been responsible for constructing and maintaining a safe, reliable, and economically efficient navigation system. Today, this system is comprised of more than 12,000 miles of inland waterways, 300 large commercial harbors, and 600 small harbors. From fiscal years 1998 through 2002, the Corps has removed an average of about 265 million cubic yards of material each year from the navigable waters of the United States, at an average annual cost of about $856 million (in constant 2002 dollars). Private industry performs most of the overall dredging, except for the work done by hopper dredges, in which both the Corps and industry perform a significant amount of the work. Of the $856 million spent annually on overall dredging, about $197 million is spent on all hopper dredging (both maintenance and new construction), with industry vessels accounting for about $148 million annually and Corps vessels accounting for about $49 million.

Each of the Corps' hopper dredges typically operates in a specific geographic area. The *Wheeler*, a large-class dredge,[1] usually operates in the Gulf of Mexico. The *McFarland*, a medium-class dredge, usually operates in the Atlantic and Gulf of Mexico. The *Essayons*, a large-class dredge, and the *Yaquina*, a small-class dredge, typically work along the Pacific coast.

Legislation enacted in the 1990s sought to further increase the role of industry in hopper dredging by placing operational restrictions on the Corps' hopper dredges. Specifically, the Energy and Water Development Appropriations Act for fiscal year 1993 and subsequent appropriations acts required the Corps to offer for competitive bidding 7.5 million cubic yards of hopper dredging work previously performed by the federal fleet. Since fiscal year 1993, the Corps has 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 for fiscal year 1996 required the Corps to initiate a program to increase the use of private hopper dredges principally by taking the *Wheeler* out of active status and placing it into ready reserve. The Corps implemented this requirement by allowing the *Wheeler* to work 55 days a year plus emergencies (which includes urgent and time-sensitive dredging needs). The 1996 act did not alter the Corps' duty to implement the dredging program in the manner most economical and advantageous to the United States, and it restricted the Corps' authority to reduce the workload of other federal hopper dredges. The conference report that accompanied the act directed the Corps to periodically evaluate the effects of the ready reserve program on private industry and on the Corps' hopper dredge costs, responsiveness, and capacity. The Energy and Water Appropriations Act for fiscal year 2002 placed another restriction on the use of the Corps' dredge *McFarland*, limiting it to emergency work and its historical scheduled maintenance in the Delaware River (about 85 workdays per year). Taken together, these restrictions have increased private industry's share of the hopper dredging workload.

In theory, restrictions on the use of the Corps' hopper dredges could generate efficiency and cost-savings benefits to both government and industry. For example, restricting the Corps' hopper dredges to fewer

[1] A hopper dredge's class is determined by its capacity—hoppers with up to 3,000 cubic yards of capacity are considered small, medium hoppers have capacity from 3,000 to 6,000 cubic yards, and large hoppers have a capacity of 6,000 cubic yards or more.

scheduled workdays could make them more available to respond to emergency dredging needs. In addition, the increase in demand for dredging by private industry could lead to improvements in dredging efficiency. If achieved, firms might be able to dredge the same amount of material at a lower cost or more material at the same cost. Furthermore, if more work were provided to the private hopper dredging industry, competition could increase if the existing dredging firms expanded their fleets or more firms entered the market.[2] Consequently, the prices that the government pays to contractors could fall. However, economic principles also suggest that if an industry is given more work without increasing capacity or the number of competing firms, prices could rise because the demand for its services has increased.

Corps Has Transferred Most of Its Hopper Dredging to Private Industry, but Still Needs to Retain a Hopper Dredge Fleet

The Corps' and private industry's respective roles in the hopper dredging market have changed since legislation enacted in 1978 prompted a movement toward privatization of hopper dredging in the United States. Since that time, the Corps has gradually reduced its hopper dredging fleet from 14 to 4 vessels, while a private hopper dredging industry of five firms and 16 vessels has emerged. Corps officials and representatives from the dredging industry, selected ports, and the maritime industry generally agreed that the Corps needs to retain at least a small hopper dredge fleet to (1) provide additional dredging capacity during peak demand years, (2) meet the emergency and national defense needs identified in the 1978 legislation, and (3) provide an alternative work option at times when the industry offers unreasonable bids or no bids at all. To determine the reasonableness of private contractor bids, the Corps develops a government cost estimate for its hopper dredging solicitations. If the low bid is no more than 25 percent above the government cost estimate, the Corps awards the contract. If all bids exceed the government cost estimate by more than 25 percent, the Corps may pursue a number of options, including performing the work itself. The practical value of this protection against high bids, however, has been limited by the Corps' use of some outdated contractor cost information and its continued use of an expired policy to calculate transit costs.

[2] Hopper dredging requires large capital outlays—a medium-class hopper dredge costs between $20 million and $40 million and normally takes 18 months to build—making it difficult for firms to enter the market quickly.

Corps and Industry Roles in Hopper Dredging Have Shifted

Before 1978, the Corps performed all of the nation's hopper dredge work. In 1978, the Congress passed legislation to encourage private industry participation in all types of dredging and required the Corps to reduce the fleet of federal vessels to the minimum necessary for national defense and emergency purposes, as industry demonstrated its capability to perform the work. According to the Senate committee report associated with the 1978 legislation, one of the law's main purposes was to provide incentives for private industry to construct new hopper dredges. Between 1978 and 1983, as a private hopper dredging industry began to emerge, the Corps reduced its hopper dredge fleet from 14 to its current 4 vessels. By the late 1980s, the Corps stopped assigning its hopper dredges to new construction projects (primarily channel deepening), leaving this work entirely to private industry. Both Corps and private industry hopper dredges continue to perform maintenance work on existing channels.

From fiscal years 1998 through 2002, the Corps' dredges performed about 28 percent of the nation's hopper dredging maintenance work, annually dredging about 16 million cubic yards of material at a cost of about $49 million (in constant 2002 dollars). During the same period, industry dredges performed about 72 percent of the nation's hopper dredging maintenance work, dredging about 40 million cubic yards of material annually, at a cost of about $93 million.[3] As a result of the 1978 legislation, seven firms emerged to compete for the Corps' hopper dredging contracts. Consolidation and firm buy-outs in the 1990s have left five firms in today's market. (Appendix II contains a more detailed description of the U.S. hopper dredge fleet.)

Corps' Hopper Dredge Fleet Addresses Several Needs

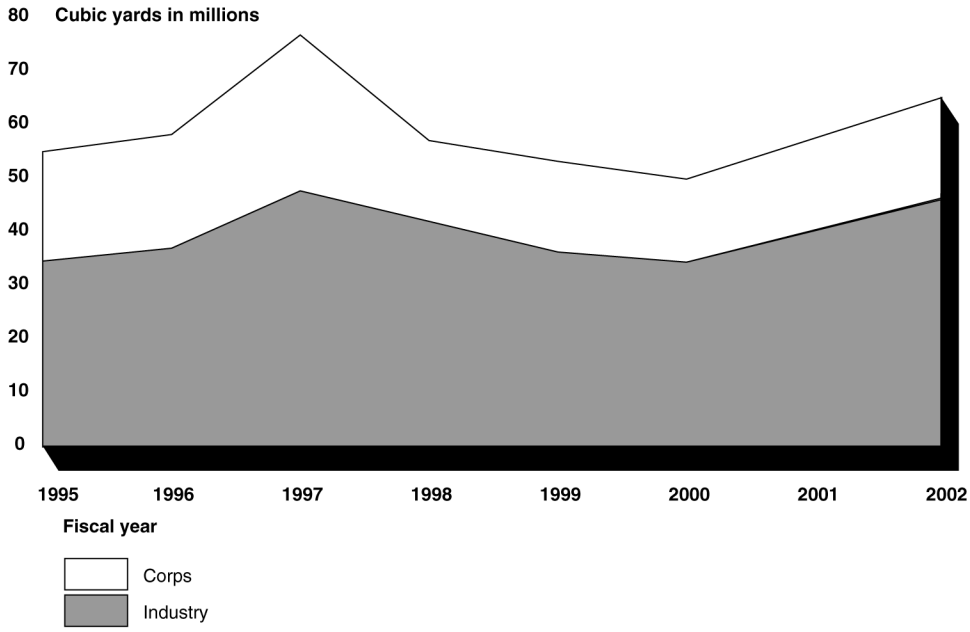
Corps officials and representatives from the dredging industry, selected ports, and the maritime industry generally agreed that the Corps' hopper dredge fleet currently (1) provides additional dredging capacity during peak demand years, (2) meets emergency dredging and national defense needs identified in the 1978 legislation, and (3) provides an alternative work option when industry provides no bids or when its bids exceed the

[3] A direct and valid comparison of the Corps' and private industry's costs to perform hopper dredge work is not possible due to various factors, which 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 the Corps' vessels may operate—180 days or fewer, compared to about 250 days for industry; 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 disposal site.

government cost estimate by more than 25 percent. In addition, representatives of selected ports and the maritime industry generally supported the Corps' retention and operation of a federal hopper dredge fleet to ensure that dredging needs are met in a timely manner.

One of the reasons for the Corps to maintain a hopper dredge fleet is that changes in annual weather patterns, such as *El Niño*, and severe weather events, such as hurricanes and floods, can create a wide disparity in the demand for hopper dredging services from year to year. During fiscal year 1997 the Corps and private industry used their hopper dredges for maintenance work to remove almost 77 million cubic yards nationwide. In contrast, during fiscal year 2000 they removed about 50 million cubic yards. (See fig. 2.) Hopper dredging needs at the mouth of the Mississippi River are particularly variable from year to year, with annual dredging requirements ranging from 2 million to 50 million cubic yards. Representatives from private dredging firms maintain that industry is not likely to build the additional capacity needed to meet demand in peak years. Corps officials and representatives from the dredging industry, selected ports, and the maritime industry generally agreed that the federal government should provide the additional dredging capacity required to meet the needs of peak demand years.

Figure 2: Maintenance Hopper Dredging Work, Fiscal Years 1995 through 2002



Source: U.S. Army Corps of Engineers.

Note: GAO analysis of Corps' Navigation Data Center data.

The Corps' hopper dredges are also needed to respond to emergency dredging assignments. For example, according to a Corps official, it was necessary for the Corps to send the *Essayons* to finish work on a project in Alaska that was critical to complete before the winter season and freezing conditions set in. In addition, Corps vessels have been used during instances where industry has submitted no bids in response to solicitations. For example, when rains in the Mississippi River Basin caused a build-up of material in navigation channels, the Corps issued a solicitation, but no bids were received because industry vessels were unavailable. Consequently, the *Wheeler* was used to perform the work. In such situations, the Corps' fleet acts as insurance to meet dredging needs, ensuring that shipping patterns are not adversely affected.

The existence of the Corps' fleet theoretically offers a measure of protection against inordinately high bids from private contractors. While the private dredging market consists of 16 dredges owned by five firms, not all dredges compete for any given solicitation because (1) some, if not most, hopper dredges are committed to other jobs; (2) hopper dredges

may be in the shipyard; (3) differences in hopper dredge size and capability mean that not all hopper dredges are ideally suited to perform the work for a particular job; and (4) hopper dredges cannot quickly move from one dredging region to another.[4] For example, large hopper dredges may have difficulty maneuvering in small inlet harbors, and small hopper dredges may be inefficient at performing large projects with distant disposal sites. Thus, the Corps' hopper dredge fleet provides an alternative dredging capability that can be brought to bear when private dredges are not available or when private industry bids are deemed too high.

Corps Bases Its Cost Estimate on Outdated Information

The Corps' government cost estimate for hopper dredging work is pivotal in determining the reasonableness of private contractor bids. The Corps is required to determine a fair and reasonable estimate of the costs for a well-equipped contractor to perform the work. By law, the Corps may not award a dredging contract if the price exceeds 25 percent of the government estimate. In such cases, the Corps has several options. It can (1) cancel the solicitation, (2) readvertise the solicitation, (3) consider challenges to the accuracy of the Corps' cost estimate by bidders, (4) convert the solicitation into a negotiated procurement, or (5) use one of its own dredges to do the work.

The accuracy of the Corps' cost estimate depends on having access to up-to-date cost information. Although the Corps adjusts contractor cost data annually to reflect current pricing levels, this step does not account for fundamental changes, such as an industry vessel reaching the end of its depreciable life or industry acquisition of new vessels. The Corps has not obtained comprehensive industrywide contractor cost information since 1988. Since then, contractors have provided the Corps updated cost information to support specific costs included in the Corps' cost estimates that they believe to be outdated, but they are not required to provide updated information for all costs. As a result, the Corps only has updated cost information that contractors provide. In our discussions with Corps officials, they acknowledged the need to initiate an effort to obtain and verify current cost data for industry vessels.

[4] There are three main regions where hopper dredging takes place in the United States—the Atlantic, the Gulf of Mexico, and the Pacific. Dredges can move readily from the Atlantic to the Gulf of Mexico (which requires at least a week), but moving from the Atlantic to the Pacific requires several weeks and transit through the Panama Canal.

In addition, the Corps continues to follow an expired policy when calculating contractor transit costs to the dredge site, further calling into question the accuracy of the government cost estimates. The Corps' Engineering Regulation 1110-2-1300, which called on the Corps to calculate industry transit costs to the dredge site based on the location of the second-closest industry dredge, expired in 1994.[5] However, the Corps continues to use this method when calculating transit costs for at least some of its solicitations. For example, Corps officials followed the expired policy when demonstrating to us how they calculated the transit costs for a solicitation in Washington State.[6] In this case, the second-closest industry dredge was located in the Gulf of Mexico, and the estimated transit costs amounted to about $480,000 because the vessel would have had to travel thousands of miles and go through the Panama Canal. However, the private contractor's dredge that performed the work was located fewer than 500 miles from the dredge site, for which the transit costs were estimated to be about $100,000. After bringing this issue to the Corps' attention, the Corps told us that it plans to reexamine its transit cost policies.

Restrictions on the Corps' Hopper Dredge Fleet Have Imposed Costs, but Benefits Are Unproven

Restrictions on the Corps' hopper dredge fleet, which began in fiscal year 1993, have imposed costs on the Corps' dredging program, but have thus far not resulted in proven benefits. Most of the costs of the Corps' hopper dredges are incurred regardless of how frequently the dredges are used. A possible benefit of the restrictions is that they could eventually encourage more firms to enter the market or existing firms to add capacity, which, in turn, may promote competition, improve dredging efficiency, and thus reduce prices. Although there has been an increase in the number of private industry hopper dredges since the restrictions were first imposed, the number of private firms in the hopper dredging market has decreased. In addition, during the same time period, the number of contractor bids per Corps solicitation has decreased, while the number of winning bids exceeding the Corps' cost estimate has increased. Restrictions on the Corps' vessels could also potentially enhance the Corps' responsiveness to

[5] In 1994 the Corps replaced the expired regulation with Corps' Engineering Regulation 1110-2-1302, which called on the Corps to base transit costs on a radius for a normal area of operations from the project site that includes a reasonable number of bidders.

[6] Transit costs have a greater impact on solicitations that take place in the Pacific Northwest, where the second-closest dredge may be more distant from the work site than for solicitations that take place in the Gulf of Mexico or the Atlantic.

emergency dredging needs. However, the Corps is unable to evaluate whether emergency dredging needs have been met more or less efficiently since the restrictions went into effect because it does not specifically identify and track emergency work performed by either Corps or industry vessels.

Corps Incurs Costs by Keeping the *Wheeler* in Ready Reserve

The Corps incurs many of the costs for maintaining and operating its hopper dredges regardless of how much the vessels are used. Thus, as shown in table 1, when the *Wheeler* was placed in ready reserve and restricted to 55 workdays plus emergencies, the average number of days it worked per year and its productivity (measured by cubic yardage dredged) declined by about 56 percent, while its costs declined by only 20 percent. Crew size declined by about 21 percent, but payroll costs declined by just 2 percent because dredging needs required the Corps to pay the smaller crew overtime to finish the work. In addition, fuel costs did not drop in proportion to use and productivity because the vessel's engines were utilized for shipboard services (e.g., electricity) while it remained at the dock—a necessary procedure for maintaining minimal vessel readiness. Other costs unrelated to crew or fuel represent the plant or capital costs of a dredge, many of which the Corps incurs regardless of how much a dredge is used.

Table 1: Summary of Operations and Cost Data of Corps' Dredge *Wheeler*

Component	Before reserve[a]	After reserve[b]	Percentage change
Average days worked	183	83	-55%
Average cubic yards	11,847,040	5,245,606	-56%
Crew size	54	42	-21%
Average cost[c]	$17,136,028	$13,631,862	-20%
Payroll costs	$3,635,146	$3,557,938	-2%
Fuel costs	$1,206,578	$832,452	-31%
Other costs[d]	$12,294,304	$9,241,472	-25%

Source: U.S. Army Corps of Engineers.

Note: GAO analysis of data obtained from the Corps' *Annual Form 27 Report of Operations—Hopper Dredges*, fiscal years 1994 through 2001.

[a]Fiscal years 1994 through 1997 represent the time period before ready reserve.

[b]Fiscal years 1998 through 2001 represent the time period after ready reserve.

[c]In constant 2001 dollars.

[d]These costs include, among other things, depreciation and repairs.

The Corps refers to the difference between a vessel's total costs and the value of the dredging services it provides (the net cost) as a "subsidy." The Corps estimates the annual subsidy to maintain the *Wheeler* idle in ready reserve at about $8.4 million.[7] This subsidy is a direct cost of ready reserve. In addition to the subsidy, the Corps must pay contractors to do the work the *Wheeler* no longer performs. The difference between the vessel's traditional workload and its current workload is approximately 6.6 million cubic yards. Depending on whether private industry hopper dredges are able to perform this work in aggregate at a lower or higher cost than if the *Wheeler* performed the work, the total cost to government of the *Wheeler* in ready reserve status could be either lower or higher than the Corps' estimated subsidy.

In addition to the *Wheeler's* subsidy, restrictions have led to inefficient operations for the other Corps hopper dredges, resulting in additional costs for the Corps. According to Corps officials, September is the ideal time to dredge in the Pacific Northwest, because dredging conditions generally deteriorate in October. The officials mentioned that, at times, the *Essayons* and the *Yaquina* have reached their fiscal year operating limits and returned to port in September, before the projects they were working on were complete. The dredges were sent back to complete the project after the new fiscal year began in October, even though weather conditions may have made dredging conditions less than optimal, and the Corps incurred additional transit costs. According to some Corps officials, the annual operating limit cannot be extended. For example, the *Essayons* stopped dredging the mouth of the Columbia River and returned to port at the end of fiscal year 2001 when it reached its operating limit. The vessel returned to finish the work at the start of the new fiscal year, but adverse weather conditions prevented it from fully dredging the river. As a result, some projects may be postponed until the following fiscal year, reprioritized, or canceled altogether.

Benefits of Restrictions Are Unproven

A potential benefit of the restrictions on the Corps' hopper dredge fleet is that an increase in demand for industry's dredging services could encourage existing firms to make capital investments (e.g., build new

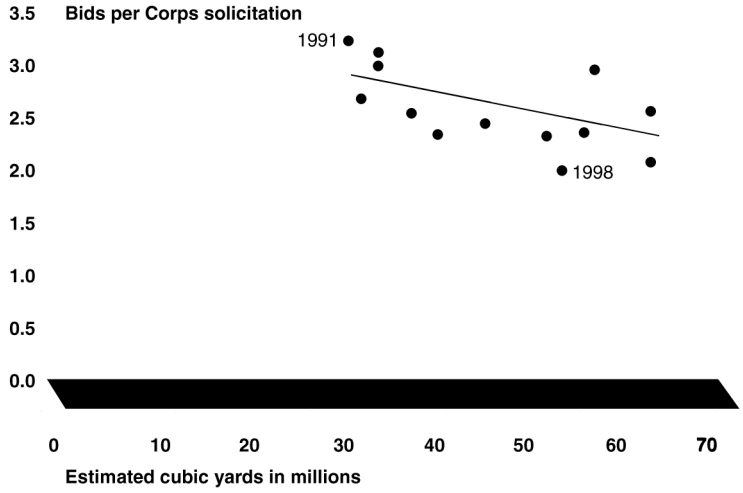
[7] According to the Corps, the *Wheeler's* average annual operating cost during ready reserve was $12.5 million. While the vessel is credited for "earning" $4.125 million for its 55 days of work (at a daily rental rate of $75,000), a subsidy of $8.375 million per year is required to maintain the *Wheeler* idle in ready reserve.

dredges or improve existing dredges) or encourage more firms to enter the dredging market. Dredging industry representatives told us that the restrictions have already led to an increase in the number of industry vessels and, as evidence, pointed to the addition of two new dredges, the *Liberty Island*, a large-class dredge introduced in 2002, and the *Bayport*, a medium-class dredge introduced in 1999, as well as the return of the *Stuyvesant*, a large-class dredge, to the U.S. hopper dredging market. Moreover, they added that since the restrictions, the private hopper dredging industry has also made improvements and enhancements to its existing fleet—specifically the *Columbia*—thus improving the efficiency of its dredging operations and increasing the capacity of its vessels. However, the representatives also told us that the restrictions are only one of several factors the private hopper dredging industry considers when deciding to acquire or build an additional dredge. In addition, firms must invest in equipment to remain competitive in any industry. As a result, it is unclear to what extent the restrictions on the Corps' vessels were a factor in industry's investment decisions to increase its fleet size and add dredging capacity.

While the private hopper dredging industry has recently placed two new dredges on line, it has sold the small-class dredge *Mermentau* and placed another small-class dredge, the *Northerly Island*, up for sale. In addition, during the last decade the private hopper dredging industry has decreased from seven firms to five firms. Specifically, since 1993, two firms exited the market, one firm entered the market, and two firms merged. The consolidation in the industry does not necessarily mean that competition has been reduced because the new industry structure could have resulted in enhanced capacity, flexibility, and efficiency for the remaining firms. However, it is uncertain whether the private hopper dredging industry is more or less competitive now than it was prior to the restrictions.

Historical data reveal that, in general, as shown in figure 3, in years when more material is available to private industry, industry submits fewer bids per Corps solicitation. For example, during fiscal year 1991, when the Corps estimated that 31.3 million cubic yards of maintenance material would be contracted out to industry, the average number of bids per solicitation was 3.2. In contrast, during fiscal year 1998, when the Corps estimated that 53.7 million cubic yards of maintenance material would be contracted out to industry, industry submitted an average of about 2 bids per solicitation.

Figure 3: Estimated Volume of Material Dredged by Industry and Average Number of Industry Bids per Corps Solicitation, Fiscal Years 1990 through 2002



Source: U.S. Army Corps of Engineers.

Notes: GAO analysis of the Corps' Dredging Information System data.

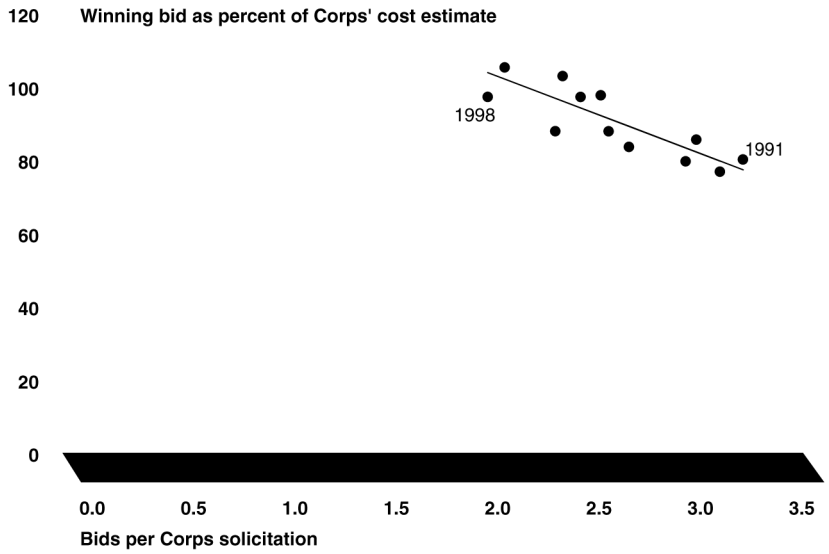
Each point represents a fiscal year.

The inverse, linear relationship is statistically significant at the 95 percent level.

Likewise, as shown in figure 4, in years when there were fewer industry bids per Corps solicitation, the average winning industry bid, as a percentage of the Corps' cost estimate, was higher.[8] For example, during fiscal year 1991, when the average number of bids per solicitation was 3.2, the average winning bid was 79 percent of the Corps' estimate. In contrast, during fiscal year 1998, when the average number of bids per solicitation was 2, the average winning bid was 97 percent of the Corps' estimate.

[8] As previously discussed, we have identified concerns related to the Corps' cost estimate. However, these concerns were largely present both before and after the restrictions, thus we have no reason to believe that these concerns would materially affect the use of the cost estimate in the information presented.

Figure 4: Annual Average Number of Industry Bids per Corps Solicitation and Winning Bid as a Percentage of the Corps' Cost Estimate, Fiscal Years 1990 through 2002



Source: U.S. Army Corps of Engineers.

Notes: GAO analysis of the Corps' Dredging Information System data.

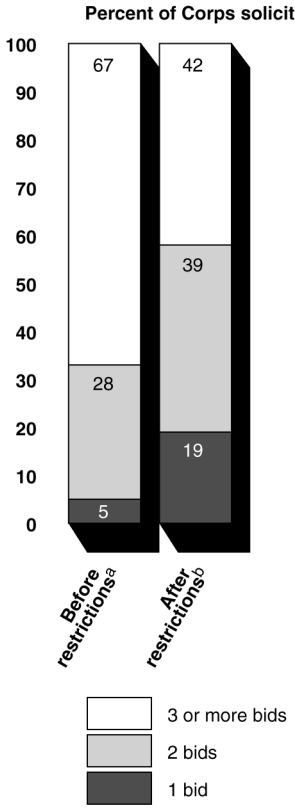
Each point represents a fiscal year.

The linear relationship is statistically significant at the 99 percent level.

In general, when there are fewer industry bids per solicitation, the winning industry bid relative to the Corps' cost estimate increases. In fiscal years 1990 through 2002, more than half of the solicitations for hopper dredging maintenance work received just one or two bids from private contractors. During these years, when only one contractor bid on a solicitation, the bid exceeded the government estimate 87 percent of the time. In contrast, when there were three or more bids on a solicitation, the winning bid exceeded the government estimate only 22 percent of the time. After the Corps' hopper dredge fleet was effectively restricted to 180 workdays (fiscal years 1993 through 2002), the number of industry bids per solicitation declined from about 3 to roughly 2.4. Specifically, as shown in figure 5, when there were no limits on the use of the Corps' hopper dredges (fiscal years 1990 through 1992), only 5 percent of solicitations received one bid. After limits were placed on the Corps' hopper dredges (fiscal years 1993 through 2002), 19 percent of solicitations had only one

bid.[9] Moreover, before the restrictions, 67 percent of the solicitations had three or more bids, whereas, after the restrictions, only 42 percent had three or more bids. These changes might have been expected because, after the restrictions, industry's share of hopper dredging work increased while the number of hopper dredging firms decreased from seven to five.

Figure 5: Comparison of Number of Industry Bids per Corps Solicitation Before and After Restrictions



Source: U.S. Army Corps of Engineers.

Note: GAO analysis of the Corps' Dredging Information System data.

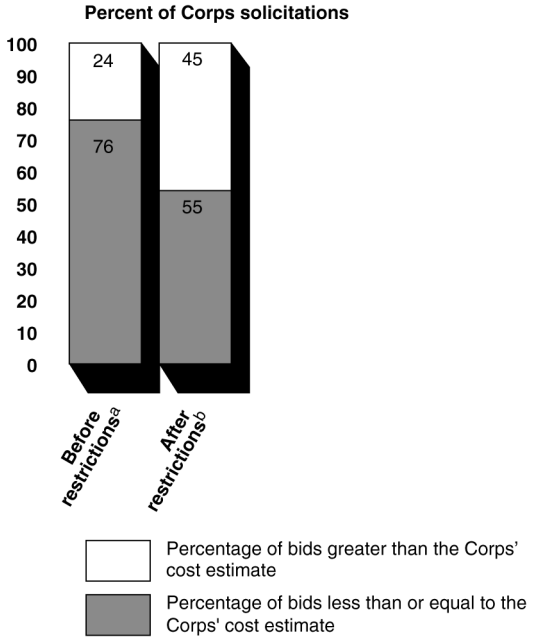
[a]Fiscal years 1990 through 1992 represent the time period before the restrictions were implemented.

[b]Fiscal years 1993 through 2002 represent the time period after the restrictions were implemented.

[9] In the 5-year period following ready reserve of the *Wheeler* (fiscal years 1998 through 2002), there were roughly 2.5 industry bids per Corps solicitation, and 19 percent of the solicitations had only one bid, while 51 percent received three or more bids.

Furthermore, in the time period following the imposition of the 180-day restriction, the frequency with which the winning industry bid exceeded the Corps' cost estimate has increased. For example, as shown in figure 6, prior to the restrictions, the winning bid exceeded the Corps' cost estimate 24 percent of the time. After the restrictions were imposed, the winning bid exceeded the Corps' estimate 45 percent of the time.[10] This finding is consistent with economic principles; that is, all else equal, an increase in demand for dredging by private industry with fixed supply would result in higher prices.

Figure 6: Comparison of Winning Industry Bids and Corps' Cost Estimates Before and After Restrictions



Source: U.S. Army Corps of Engineers.

Note: GAO analysis of the Corps' Dredging Information System data.

[a]Fiscal years 1990 through 1992 represent the time period before the restrictions were implemented.

[b]Fiscal years 1993 through 2002 represent the time period after the restrictions were implemented.

[10] In the 5-year period following ready reserve of the *Wheeler* (fiscal years 1998 through 2002), 42 percent of the winning bids exceeded the Corps' cost estimate, and 58 percent of the winning bids were less than the Corps' cost estimate.

It should be noted that the extent to which the restrictions contributed to the decrease in the number of industry bids per Corps solicitation and the increase in the winning industry bid relative to the Corps' cost estimate is unknown. Other factors could have also contributed to these changes. For example, an increase in the demand for hopper dredging services for new construction projects or beach nourishment could lead to a decrease in the number of bids received for maintenance projects. Similarly, the introduction of environmental restrictions on when hopper dredging can take place could contribute to an increase in the winning industry bid relative to the Corps' cost estimate. Nevertheless, the decrease in the number of bids per solicitation and the increase in bids exceeding the Corps' cost estimates raises questions about the effects the restrictions may have had on competition and prices, demonstrating the need for a comprehensive analysis of the effects of the restrictions on competition, efficiency, and prices.

Another potential benefit of restrictions on the use of the Corps' vessels is enhanced responsiveness to emergencies. However, there is disagreement within the Corps on this issue. One Corps official believes that a dredge in ready reserve is better able to handle emergencies than if it were working 180 days because it is in a "standby" status at the dock, ready to respond. In contrast, others in the Corps believe that a dredge can respond just as well or better to an emergency while working a full schedule because the dredge can temporarily halt the project it is working on, respond to the emergency, and then return to its scheduled work.[11] During our discussions with representatives from selected ports and the maritime industry, we did not learn of any instances of problems in the Corps' responsiveness to emergencies prior to restrictions or instances of improved response time since the restrictions went into effect.

A major reason that the Corps is unable to evaluate whether emergency dredging needs have been met more or less efficiently since the restrictions went into effect is that its dredging database—the Dredging Information System—does not specifically identify and track emergency work performed either by Corps or industry vessels. Consequently, the Corps cannot readily determine how many days have been needed for each of its vessels to respond to emergencies. In addition, the Corps does

[11] A vessel actively working will respond to an emergency with a full crew, whereas a vessel in reserve may be called to respond to an emergency during a period when it has a reduced crew and may be unable to assemble a full crew and respond to an emergency in a timely manner.

not know whether it is paying contractors more or less for performing the emergency dredging projects compared to the costs it pays for routinely scheduled maintenance work. Such information would be a valuable tool for determining how emergency dredging needs can be met in a manner that is the most economical and advantageous to the government—that is, when and under what circumstances to contract with the private hopper dredging industry for these emergencies or when to use Corps vessels. In discussing this issue, Corps officials agreed that obtaining information on emergencies is important for managing their hopper dredging program and told us they have initiated efforts to collect such data to incorporate into their dredging database.

Corps Has Not Justified the Existing and Proposed Restrictions on Its Hopper Dredge Fleet

In a June 2000 report to the Congress, the Corps stated that the placement of the *Wheeler* in ready reserve had been a success and recommended that the vessel remain in ready reserve. However, the report contained a number of analytical and evidentiary shortcomings, and, when asked, the Corps could not provide any supporting documentation for its recommendation. In addition, the report also proposed that the *McFarland* be placed in ready reserve, but the Corps did not conduct an analysis to support this proposal. The costs to place the *McFarland* in ready reserve are likely to be similar to the costs incurred by placing the *Wheeler* in ready reserve. Because the *McFarland's* workload would be reduced from 180 days to 55 days plus emergencies, the Corps would incur annual costs of about $8 million when the vessel is idle—largely because much of a vessel's costs are incurred regardless of its level of use. Furthermore, according to the Corps, the *McFarland* will require at least a $25 million capital investment to ensure its safety, operational reliability, and effectiveness for future service. It is questionable whether such an investment in a vessel that would be placed in ready reserve and receive only minimal use is in the best interest of the government.

Corps Has Not Comprehensively Analyzed the Costs and Benefits of Restrictions

The Water Resources Development Act for 1996 required the Corps to determine whether (1) the *Wheeler* should be returned to active status or continue in ready reserve status or (2) another federal hopper dredge should be placed in ready reserve status, and issue a report to the Congress on its findings. The Corps issued the required report in June 2000,[12] recommending that the *Wheeler* remain in reserve and proposing

[12] *Report to Congress*, *Section 237*, *Hopper Dredges: Ready Reserve Status of the Hopper Dredge Wheeler.*

that an additional dredge, the *McFarland*, also be placed in reserve. However, when asked, the Corps official who authored the report told us that he did not have any supporting documentation for the report. In addition, the report had a number of evidentiary and analytical shortcomings. For example, the evidence presented in the report showed that the price the government paid to the industry for hopper dredging was higher in the 2 years after the *Wheeler* was put in ready reserve than it was the year before. This raises questions about the validity of the recommendation contained in the report.

Furthermore, the report did not contain a comprehensive analysis. A comprehensive economic analysis of a government program or policy would identify all the resulting costs and benefits, and, where possible, quantify these measures. Both the quantitative and qualitative costs and benefits would need to be compared and evaluated to determine the success or failure of a program and to potentially be used as a basis for future policy decisions. With regard to the restrictions on the Corps' hopper dredges, a comprehensive economic analysis might contain, among other things, all costs associated with the nonuse of the vessel and the potential benefits that might result due to efficiency gains, increased competition, and lower prices. The analysis might also examine whether ports, harbors, and access channels were maintained more or less effectively, or whether emergency dredging needs were met in a more or less timely and cost-effective manner following implementation of the restrictions.

Corps Has Not Demonstrated that Further Restrictions on the Use of the Corps' Dredge *McFarland* Are Warranted

The Corps has not demonstrated that placing an additional hopper dredge in ready reserve, specifically the *McFarland*, would be beneficial to the United States. In its June 2000 report to the Congress on the ready reserve status of the dredge *Wheeler*, the Corps proposed that the *McFarland* be the next dredge placed in reserve. However, the Corps did not offer any analysis on the potential costs of placing an additional Corps hopper dredge in reserve or the benefits of such an action. Moreover, to be available for future use, the 35-year-old *McFarland* requires at least a $25 million capital investment to ensure its safety, operational reliability, and effectiveness. The repairs include asbestos removal; repairs to the hull; engine replacement; and upgrades of equipment, machinery, and other shipboard systems. It is questionable whether spending $25 million to rehabilitate the *McFarland* and then placing it in ready reserve is prudent.

Furthermore, if the *McFarland* were placed in ready reserve, the Corps would incur annual costs similar to the subsidy that is already incurred for

the *Wheeler*. Because the *Wheeler's* costs do not vary proportionally to its use, the costs to operate the vessel 55 days a year plus emergencies in ready reserve is only marginally less than if it were to operate 180 days a year. The Corps estimates that if the *McFarland* were placed in ready reserve, it would require an annual subsidy of about $8 million to remain idle. The Corps would also need to contract out the work the *McFarland* would no longer be doing—approximately 2 to 3 million cubic yards per year. Depending on whether private industry hopper dredges are able to perform this work in aggregate at a lower or higher cost than if the *McFarland* performed the work, the total cost to government of the placing the *McFarland* in reserve could be either lower or higher than the estimated annual subsidy. Finally, placing the *McFarland* in ready reserve could increase competition if such restrictions spurred an increase in investment in private hopper dredges. However, it is questionable whether placing the *McFarland* in ready reserve would provide enough incentive for industry to make additional investments.

Conclusions

Hopper dredges play a critical role in keeping the nation's ports open for both domestic and international trade. This function has been and will likely continue to be carried out through a mix of private industry and government-owned dredges. At issue is how to use this mix of dredges in a manner that maintains the viability of the private fleet while minimizing the costs to government. The Corps has proposed to the Congress that additional restrictions on the use of its hopper dredges are warranted, but it cannot provide any analytical evidence to support its position. The limited evidence that does exist indicates that these restrictions have imposed costs on the government, while the benefits are largely unproven. Unless and until the Corps gathers the data, comprehensively analyzes the costs and benefits of restrictions on the use of its hopper dredges, and takes the steps to update its cost estimates, there is no assurance that the nation's hopper dredging needs are being met in a manner that is the most economical and advantageous to the government.

Recommendations for Executive Action

In an effort to discern the most economical and advantageous manner in which to operate its hopper dredge fleet, and because the Corps has been unable to support, through analysis and documentation, the costs and benefits of placing its hopper dredges in ready reserve, we recommend that the Secretary of the Army direct the Corps of Engineers to

- obtain and analyze the baseline data needed to determine the appropriate use of the Corps' hopper dredge fleet including, among

other things, data on the frequency, type, and cost of emergency work performed by the Corps and the private hopper dredging industry; contract type; and solicitations that receive no bids or where all the bids received exceeded the Corps' estimate by more than 25 percent;

- prepare a comprehensive analysis of the costs and benefits of existing and proposed restrictions on the use of the Corps' hopper dredge fleet—including limiting the Corps' dredges to 180 days of work per year, placing the *Wheeler* into ready reserve, limiting the *McFarland* to its historic work in the Delaware River, and placing the *McFarland* into ready reserve status; and

- assess the data and procedures used to perform the government cost estimate when contracting dredging work to the private hopper dredging industry, including, among other things, (1) updating the cost information for private industry hopper dredges and (2) examining the policies related to calculating transit costs.

Agency Comments

We provided a draft of this report to the Acting Assistant Secretary of the Army and the Dredging Contractors of America for review and comment.

In a letter dated March 21, 2003, the Department of the Army (Army) provided comments on a draft of this report. The Army agreed with our recommendations and provided time frames for implementing each of them. It also provided additional comments suggesting clarification and elaboration on a number of issues discussed in our report. See appendix III for the Army's comments and our responses.

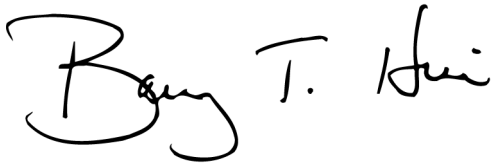
In a letter dated March 3, 2003, the Dredging Contractors of America (DCA) provided detailed comments on a draft of this report. DCA generally agreed with our recommendations. However, it believed strongly that reducing the scheduled use of the Corps' hopper dredges has resulted in proven benefits. We continue to believe that the relationship between the restrictions and benefits to the government are unproven because (1) the Corps incurs costs related to the underutilization of its dredges, and (2) since the restrictions were first imposed, the Corps has received fewer industry bids per solicitation, and the percentage of winning industry bids that exceed the Corps' cost estimates has increased. See appendix IV for DCA's comments and our responses.

We conducted our review between January 2002 and February 2003 in accordance with generally accepted government auditing standards. A

detailed discussion of our scope and methodology is presented in appendix I.

We will send copies of the report to the Secretary of the Army, appropriate congressional committees, and other interested Members of Congress. We will also make copies available to others upon request. In addition, the report will be available at no charge on the GAO Web site at http://www.gao.gov.

If you or your staff have questions about this report, please contact me at (202) 512-3841. Key contributors to this report are listed in appendix V.



Barry T. Hill
Director, Natural Resources
and Environment

Appendix I: Scope and Methodology

To assess the changing roles of the Corps and industry in hopper dredging and the characteristics of the hopper dredging industry, we obtained Corps' studies and data from the Corps' Navigation Data Center that provided information on the hopper dredging requirements of the United States, including the quantity of material dredged annually by the Corps and the private hopper dredging industry, and their associated costs. We also reviewed the laws that define these roles. In addition, we interviewed Corps officials; representatives from the five hopper dredging firms (B+B Dredging Co., Inc., Bean Stuyvesant LLC, Great Lakes Dredge & Dock Company, Manson Construction Co., and Weeks Marine, Inc.); the maritime industry (the Delaware River Port Authority, Maritime Exchange for the Delaware River and Bay, Navios Ship Agencies, Inc., and the Steamship Association of Louisiana); dredging and port associations (Dredging Contractors of America, Pacific Northwest Waterways Association, and American Association of Port Authorities); and selected ports (Portland, Seattle, New York/New Jersey, New Orleans, and Wilmington). To obtain a better understanding of hopper dredging from the perspective of the private hopper dredging industry, we visited and toured a medium-class industry hopper dredge working in the Chesapeake and Delaware Canal and interviewed its crew. Moreover, we reviewed the Corps' cost estimating policies.

To determine the intent and effects of the restrictions placed on the use of the Corps' hopper dredge fleet, we analyzed the laws governing the use of the Corps' hopper dredges. We also reviewed studies conducted by the Corps and the Pacific Northwest Waterways Association. For qualitative information, we obtained documents and interviewed Corps officials from headquarters and district and division offices, including Jacksonville, New Orleans, Philadelphia, Portland, Walla Walla, and the North Atlantic Division, as well as representatives from the private hopper dredging firms, selected ports, dredging and port associations, and the maritime industry. For quantitative information, we performed descriptive statistical analyses using data on the winning contractor bids, estimated industry dredging volumes, and the Corps' cost estimate available from the Corps' Dredging Information System database.

To evaluate whether further restrictions on the Corps' hopper dredge fleet, including placing the Corps' dredge *McFarland* in ready reserve, are justified, we reviewed studies and analyses performed by the Corps to support its proposal to place the *McFarland* in ready reserve. We also interviewed officials from the Corps and representatives from the private hopper dredging industry, selected ports, and the maritime industry to gain their views on the possible effects on competition and emergency

response if the current restrictions on the Corps' hopper dredges, particularly the *McFarland*, were modified. To determine the costs associated with repairing the *McFarland*, we obtained and analyzed cost estimates for the repairs prepared by the Corps' Philadelphia district office and discussed the estimates with Corps district and headquarters officials. We also visited and toured the *McFarland* when it was working in the Delaware River and interviewed the *McFarland's* crew and Corps officials from the Philadelphia district and the North Atlantic Division offices.

We conducted our review between January 2002 and February 2003 in accordance with generally accepted government auditing standards.

Appendix II: The U.S. Hopper Dredge Fleet

There are currently 20 hopper dredges operating in the United States. (See table 2.) Of the 20 dredges, 4 are small-class hopper dredges, 10 are medium-class hopper dredges, and 6 are large-class hopper dredges. Of the 16 private hopper dredges, Great Lakes Dredge & Dock Company owns 7, Manson Construction Co. owns 3, and the remaining firms (B+B Dredging Co., Inc., Bean Stuyvesant LLC, and Weeks Marine, Inc.) each own 2.

Table 2: Corps and Private Industry Hopper Dredge Fleets

Size	Owner	Vessel	Capacity (in cubic yards)	Year built
Large-class	Great Lakes Dredge & Dock Company	*Liberty Island*	6,540	2002
		Long Island	16,000	1971
	Bean Stuyvesant LLC	*Stuyvesant*	11,200	1982
		Eagle I	6,600	1981
	Corps of Engineers	*Wheeler*	8,256	1982
		Essayons	6,000	1983
Medium-class	B+B Dredging Co., Inc.	*Columbia*	4,000	1986[a]
	Weeks Marine, Inc.	*B.E. Lindholm*	4,150	1985
		R.N. Weeks	4,000	1987
	Manson Construction Co.	*Bayport*	5,000	1999
		Newport	4,000	1983
	Great Lakes Dredge & Dock Company	*Dodge Island*	3,600	1980
		Manhattan Island	3,600	1977
		Padre Island	3,600	1981
		Sugar Island	3,600	1979
	Corps of Engineers	*McFarland*	3,140	1967
Small-class	Great Lakes Dredge & Dock Company	*Northerly Island*	2,160	1983
	Manson Construction Co.	*Westport*	1,800	1978
	B+B Dredging Co., Inc.	*Atchafalaya*	1,300	1980
	Corps of Engineers	*Yaquina*	1,020	1981

Source: U.S. Army Corps of Engineers.

[a]Although the vessel was originally built in 1944 to transport military equipment in World War II and later converted to a hopper dredge, according to Corps' data, 1986 is listed as the year the vessel began its service.

Appendix III: Comments from the Department of the Army

DEPARTMENT OF THE ARMY
OFFICE OF THE ASSISTANT SECRETARY
CIVIL WORKS
108 ARMY PENTAGON
WASHINGTON DC 20310-0108

REPLY TO
ATTENTION OF

21 MAR 2003

Mr. Barry T. Hill
Director
Natural Resources and Environment
United States General Accounting Office
441 G Street, NW
Washington, D.C. 20548-0001

Dear Mr. Hill:

This is in response to your letter dated February 20, 2003, requesting comments on GAO's proposed report entitled *Corps of Engineers: Effects of Restrictions on Corps' Hopper Dredges Should be Comprehensively Analyzed* (GAO-03-382).

Comments on the draft report are enclosed. This constitutes the Department of Defense response on the draft report.

Sincerely,

George S. Dunlop
Deputy Assistant Secretary of the Army
(Policy and Legislation)

Enclosure

Printed on Recycled Paper

Effects of Restrictions on Corps' Hopper Dredges Should be Comprehensively Analyzed

GAO-03-382

Recommendation: Obtain and analyze the baseline data needed to determine the appropriate use of the Corps' hopper dredge fleet including, among other things, data on the frequency, type, and cost of emergency work performed by the Corps and the private hopper dredging industry; contract type; and solicitations that receive no bids or where all the bids received exceeded the Corps' estimate by more than 25 percent.

Concur. The Corps has initiated a revision to its existing Dredge Information System to ensure the appropriate data are included. These data will begin to be collected by 1 September 2003.

Recommendation: Prepare a comprehensive analysis of the costs and benefits of existing and proposed restrictions on the use of the Corps' hopper dredge fleet – including limiting the Corps dredges to 180 days of work per year, placing the WHEELER into ready reserve, limiting the MCFARLAND to its historic work in the Delaware River, and placing the MCFARLAND into ready reserve status.

Concur. The Corps will prepare the analysis, and this analysis will be completed on 1 December 2003.

Recommendation: Assess the data and procedures used to perform the government cost estimate when contracting dredging work to the private hopper dredging industry, including, among other things, (1) updating the cost information for private industry hopper dredges and (2) examining the policies related to calculating transit costs.

Concur. The Corps has initiated an evaluation of the estimating procedures, policies and costs. A report of this evaluation will be completed on 15 March 2004.

Note: GAO response to the Army's additional comments appear at the end of this appendix.

Additional Comments

The following additional comments are included.

The GAO report addresses 6 issues, synopsized as follows:

1. Government Estimates – using outdated cost information and policies related to calculating transit costs.
2. Restrictions on Corps hopper use not resulting in proven benefits.
3. No net increase in number of industry hopper dredges after 10 years of restrictions.
4. Number of bids per solicitation decreased subsequent to imposition of restrictions.
5. Data issues, including inability to determine emergency work.
6. June 2000 Report to Congress lacked supporting documentation.

1. Government Estimates:

The cost information for hopper dredges is outdated and needs to be evaluated. An effort has been initiated to improve the cost data for hopper dredges. However, it should be noted that significant cost factors have increased, such as insurance, labor, and fuel. Accordingly, when a dredge is at or near full depreciation, it normally experiences increased maintenance and repair costs, such that the offsets for one cost may be comparable to changes in other costs. The issue regarding following an expired policy when calculating contractor transit costs, or mobilization/demobilization costs, is not viewed as presented by GAO. This issue is only pertinent to the hopper dredging work in the Pacific Northwest. It is correct that the previous policy prescribed calculating mobilization based on the second closest dredge, and Government Estimates for hopper dredge procurements in the Pacific Northwest did calculate the mobilization based on the second closest dredge. However, the unique situation in the Pacific Northwest with only 1 industry hopper dredge normally being stationed on the west coast, warrants expansion of the normal area of operations to include a reasonable number of bidders to include a second dredge from the Gulf of Mexico. This application is consistent with current Corps engineering regulations. In addition to having accurate cost information to support a Government Estimate, there are opportunities to minimize the cost impacts and improve competition by the development of a regional hopper dredging procurement for the west coast, which includes several navigation projects and additional hopper dredging requirements. Regional packaging requires coordinated budget support from at least 2 districts in 2 separate Major Subordinate Commands.

2. Restrictions on Corps Hopper Dredge Use Not Resulting In Proven Benefits:

The GAO discussion regarding restrictions on Corps hopper dredge use needs clarification . The report presents a specific case regarding operational constraints in the Northwest, and a statement that the total number of hopper dredges has not increased. Both of these are misleading. The Corps hopper dredge owning district has the flexibility to schedule the dredge, within the constraints of the maximum allowable number of days, to be available for known shoaling events in the navigation projects served by that dredge. As such, the district can either choose to ensure operating days are scheduled to coincide with the latter part of the Fiscal Year, or they can proactively procure an industry hopper dredge to be scheduled for this same period.

The work not performed by the WHEELER as a result of being in a ready reserve status averages about 6.6 million cubic yards (mcy) per year. This equates to either 3 small contracts (2.3 mcy) or 1 large (6.8 mcy) industry hopper dredge contract in the Mississippi River. If the river is not shoaling, then none of those contracts would be required, and average savings of $4.75 million (based on average cost of current industry hopper dredge contracts in the Mississippi River) could be realized . However, if the WHEELER were not in ready reserve, it would have been scheduled to dredge in the river, or in some other project, taking away additional work form the industry hopper dredges. When the WHEELER is in ready reserve and industry is performing this work, this added work increases the utilization of the industry dredges, and effectively reduces the cost of the contractors' dredges over time. A simple sensitivity analysis of hopper dredge utilization as a function of unit price indicates that the cost of dredging could be reduced from 13- 24 percent, depending upon the size of the industry hopper dredge and whether the dredge worked 6 months or up to 11 months per year.

3. No Net Increase in Number of Industry Hopper Dredges after 10 Years of Restrictions:

The GAO report does not address the significance of capacity in measuring the net change in the industry hopper dredge fleet. Since 1993, significant changes have occurred in the makeup of the Corps and industry hopper dredge fleets. Besides the acknowledged addition of the BAYPORT and LIBERTY ISLAND, there have been additional improvements to the industry hopper dredge capacity. The hopper dredge STUYVESANT was not in country until 1995, and shortly after returning was committed to a long term dredging project with the Navy in San Diego, which meant the industry's largest hopper dredge was not available until 1996. When it did return to the U.S., it

reconfigured its hopper structure and increased the capacity of the dredge from 9200 cubic yards to 11,200 cubic yards. The hopper dredge COLUMBUS, now called the COLUMBIA, prior to 1998 was not used except for daylight dredging for a few months only in the Great Lakes. In 1998, the dredge was taken out of the Great Lakes and began successfully competing for hopper dredge work in the Gulf, operating 24 hours per day throughout the entire year. These changes are significant additions to the industry capability.

4. Number of Bids Per Solicitation Decreased Subsequent to Imposition of Restrictions:

With additional workload being offered to the same number of hopper dredge companies, it would be expected that some jobs would result in experiencing only one bid. With additional workload being offered to these same industry hopper dredges resulting in peak workload periods when all dredges are working, one would expect a contractor to take advantage of an opportunity to bid a higher price, anticipating no competition. The results of the GAO analysis regarding bid results seem understandable and reflect normal supply and demand economic principles.

5. Data Issues, Including Inability to Determine Emergency Work:

There are additional data sets that need to be included in the existing Corps Dredging Information System. The Corps has initiated a revision to its existing system to address these data. While it is true that there is no current means to retrieve the work that was classified as an emergency, the Corps can determine the minor amount of work that was an emergency. One action taken as a result of Section 237 of the Water Resources Development Act of 1996 (WRDA96) was the establishment of the Industry Corps Hopper Dredge Management Group (ICHDMG). This group works to ensure that the time-sensitive and urgent dredging needs are managed to preclude the need to declare an emergency condition in most cases. A mechanism has been developed to flag pending capability shortfalls, address urgent dredging requirements, and implement an iterative asset management process to ensure a best-case response. This process has resulted in both industry and Corps assets being used to resolve the time-sensitive dredging needs in a cost effective manner.

6. June 2000 Report to Congress Lacked Supporting Documentation:

In regard to the Report to Congress required by Section 237 of WRDA96, the Corps reported to Congress based on the criteria implied in the added title of the section, "(c) Program to Increase Use of Private Dredges." The report considered the parameters addressed in the section regarding private industry submitting responsive and responsible bids, developing procedures to ensure private industry hopper dredge capacity is available for routine and time-sensitive dredging needs, and ensuring that the WHEELER, in its ready reserve status is able to perform emergency work. While the data presented in the report indicate a higher average unit price for industry work subsequent to the WHEELER being placed in ready reserve, the difference in average unit price can not be used as an indicator that the price paid to the industry was higher for similar work as was previously performed by the industry. There are many variables, as well as substantially different hopper dredging requirements for the same projects in different years. Thus, comparing average unit price alone can not be used as an indicator of increased or decreased cost to the program. In a given year, the mix of hopper dredging contracts includes beach nourishment work, shallow and deep draft ocean inlet work, river dredging, some of which requires pumpout, and new work dredging. The range in unit prices can be from $0.26/cubic yard to as much as $14/cubic yard. Dredging in the same project can vary substantially from year to year, e.g., the Mississippi River can require dredging from 2 million cubic yards to 50 million cubic yards per year. When there are several deepening contracts underway, the flexibility of the industry hopper dredges are minimized and reduced competition for other work may reflect higher unit prices. Environmental windows have constricted the available time for accomplishing hopper dredging work, imposing higher risks on the contractors to complete the requirements in shorter periods of time. All of these factors as well as several more can influence the cost of hopper dredging. Therefore, it would be extremely difficult to conclude that placing the WHEELER in ready reserve would result in increased costs. With regard to the recommendation to place a second hopper dredge in ready reserve, the Corps considered the changes in the industry capacity, the management flexibility of having Corps assets in a ready reserve status, and the fact that comparably sized industry dredges operate at substantially less per day than the MCFARLAND.

In FY 2002, 73.9 million cubic yards were dredged by hopper dredges, with 82% (60.6 mcy) of the hopper work performed in the Atlantic and Gulf of Mexico. Of this portion, industry performed 90% of the work (54.8 mcy). Several deep draft navigation projects are being improved, and all have an ocean channel that will require hopper dredging. Many of these projects are subject to environmental windows.

With the projections for foreign trade expected to double in the next 20 years, and the rapid expansion, both in number and size, of container ships that will use our ports, the requirements for reliable, fully maintained navigation channels will increase. Coupled with this requirement is the expectation that beach nourishment work will continue at a relatively constant level. Hopper dredging workload will increase.

In the last three years, industry has added 2 new hopper dredges to their capability, the BAYPORT and the LIBERTY ISLAND. In response to the large workload in the Gulf and Atlantic, all but two industry dredges are located in the east. However, because of the Southeast Atlantic turtle window restrictions, and the preference for beach nourishment work to be performed during the winter months, peak workload demands can exceed the capacity of the industry fleet. It is during these peak periods when the value of the Corps dredges is fully realized for two reasons. First, as the last available industry dredges bid on work, and the expectation of being the sole bidder arises, the cost of the work begins to escalate – a normal response to supply and demand economics. The Corps minimum fleet hopper dredges represent a means to keep these cost escalations in check. If contractor bids exceed 125% of the Government Estimate, the Corps can reject the bids and perform the work with the minimum fleet hopper dredges. Second, the Corps ready reserve hopper dredge WHEELER and the MCFARLAND stand ready to respond when industry is fully engaged and unforeseen, time-sensitive requirements occur.

In summary, the Corps has been continually evaluating and analyzing the appropriate use of Federal and industry hopper dredges in fulfilling its navigation mission. Determinations of the proper mix of ready reserve and fully operational Federal hopper dredges can not be solely derived from analyzing previous data. The Corps is in the process of refining the Dredging Information System to ensure the data will supply the needed information for management of hopper dredging. The Government Estimating process and data are being reviewed and, where appropriate, will be updated.

We appreciate the opportunity to comment on this draft report.

Discussed below are GAO's corresponding detailed responses to the Army's six numbered additional comments.

1. As discussed in our report, the Corps' cost estimate is pivotal in determining the reasonableness of private contractors bids, and by law the Corps may not award a contract if the bid price exceeds the cost estimate by more than 25 percent. Consequently, we believe that it is critical for the Corps to have comprehensive data for all costs and all industry vessels. The Army recognized in its comments that the cost information for industry hopper dredges is outdated and needs to be evaluated, and has initiated an effort to improve the cost data. While we recognize that updating the cost data could potentially increase or decrease the Corps' cost estimates, we believe that unless the Corps has updated cost data for all industry vessels, there is no assurance that the Corps' cost estimates are a reliable tool for determining whether industry bids are within 25 percent of the government estimate as required by law. The Army's suggestion of clustering several navigation projects for west coast contracts—similar to the Dredging Contractors of America's comment numbered 3—is one of several possible options for addressing the costs of moving dredges to and from the west coast region.

2. In our report, we illustrated how a rigid interpretation of the Corps' policy that limits the number of days its vessel can operate resulted in inefficient operations. We recognize that the Corps' hopper dredge owning district has the flexibility to schedule the dredge within the maximum allowable number of days. However, because time-sensitive dredging needs may disrupt the scheduled use of the dredge, we believe that it would be prudent for the Corps to examine whether there is a need for some flexibility in implementing the annual operating restrictions on the Corps vessels.

   As discussed in our report, the Corps incurs many of the costs for maintaining and operating its hopper dredges regardless of how much the vessels are used. While it is true that the Corps would save contracting costs if the river is not shoaling and the work previously performed by the *Wheeler* does not need to be done, the Corps is still paying money to maintain the *Wheeler* idle in reserve when the vessel could be working to pay for its costs. We recognize that it is plausible that private industry's hopper dredging costs could decrease over time if their vessels performed more work. However, more important to the government, is how any potential decrease in industry costs are passed along to the government in the form of lower prices. The data in our report raise questions about whether any cost savings industry has realized have trickled down to the government. The Army's suggestion regarding a sensitivity analysis is one of many analyses that it may wish to

consider in its comprehensive analysis of the costs and benefits of existing and proposed restrictions on the use of the Corps' hopper dredges.

3. As acknowledged in our report, private industry has increased its hopper dredging capacity. However, the exact change in capacity and the degree to which the capacity increases are attributable to the restrictions on the Corps vessels is uncertain. While it is plausible that the restrictions may have caused industry to make these capital improvements, representatives of the dredging industry told us that the restrictions were one of several factors that they considered before building or acquiring additional vessels, including the construction of the *Bayport* and the *Liberty Island*. It is uncertain whether these investments occurred as a result of the restrictions or whether the investments were necessary to remain competitive in the industry. Hypothetically, more vessels and increased capacity should translate to more bids and lower bid prices. However, our analysis showed that the number of industry bids per hopper maintenance dredging solicitation declined from about 3 bids before restrictions to roughly 2.4 bids after restrictions were placed on the Corps vessels. This finding reinforces the need for a comprehensive analysis of the benefits and costs of the restrictions on the Corps' dredges.

4. The Army's comment reinforces our concerns about whether the restrictions have resulted in proven benefits. This is one of the issues that should be considered in the comprehensive analysis we are recommending.

5. The Army recognizes the need to update the information being collected by its Dredging Information System and has initiated efforts to address this issue. Obtaining and analyzing such information is an important prerequisite to determine whether all hopper dredging needs, in particular time-sensitive needs, are being met in the manner most cost-effective to the government. While the Army refers to a mechanism they have developed with industry to ensure that time-sensitive and urgent dredging needs are managed, we believe it is premature to claim that the process has resulted in meeting time-sensitive dredging needs in a cost-effective manner.

6. The Army's comments did not address the lack of supporting documentation for its June 2000 Report to Congress. Instead, the Army reiterated points it has made in its previous comments and raised a number of other issues related to hopper dredging. Until a comprehensive analysis is performed on the benefits and costs of restrictions on the Corps' hopper dredge fleet, there is no assurance that the Nation's hopper dredging needs are being met in the manner that is most economic and advantageous to the government.

Appendix IV: Comments from the Dredging Contractors of America

Note: GAO responses to the Dredging Contractors of America appear at the end of this appendix.

Dredging Contractors of America
Sustaining America's Access to the World

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DCA

March 3, 2003

Barry T. Hill
Director, Natural Resources
and Environment
U.S. General Accounting Office
441 G Street NW
Washington, DC 20548

Dear Mr. Hill:

Attached are the official written comments of the Dredging Contractors of America (DCA) to the proposed General Accounting Office report entitled *Corps of Engineers: Effects of Restrictions on Corps' Hopper Dredges Should be Comprehensively Analyzed* (GAO-03-382).

DCA appreciates the opportunity to provide comments on this proposed report. The information presented in the report will have direct and significant implications for the DCA and its members that operate hopper dredges.

DCA is a non-profit organization representing the nation's dredging and marine construction contractors. DCA represents the private companies that contract with the Army Corps of Engineers for dredging services, including the five companies that provide hopper dredging services to the Corps.

Please direct any questions that you may have regarding these comments to me on (703) 518-8408. Again, thank you for this opportunity and for the cooperation the General Accounting Office has shown regarding this matter.

Sincerely yours,

Mark D. Sickles
Executive Director

Dredging Contractors of America

DCA

DCA appreciates the opportunity to provide written comments on the proposed General Accounting Office (GAO) report entitled *Corps of Engineers: Effects of Restrictions on Corps' Hopper Dredges Should be Comprehensively Analyzed* (GAO-03-382) and offers the following comments with attached supporting information.

- GAO characterizes the 1978 legislation as "encouraging" private industry participation in dredging, but does not include reference to the legal mandate requiring the Secretary of the Army to use contracts if industry has the capability and can do so at reasonable prices and in a timely manner. This provides important context for any analysis. DCA generally agrees that the Corps should use updated contractor cost information and should not use the expired policy for calculating mobilization (transit) costs in developing cost estimates. (Refer below to 1, 2 and 3.)

- DCA strongly disagrees that reducing the scheduled use of Corps hopper dredges has not resulted in proven benefits. Available information and data show that benefits have resulted. In particular, benefits and competition have been increasing since the Corps hopper dredge *Wheeler* was placed in ready reserve. (Refer below to 4, 5, 6, 7 and 8.)

- DCA generally agrees that the Corps should analyze the costs and benefits of existing and proposed reductions in the scheduled use of the Corps hopper dredge fleet. Furthermore, DCA suggests that this analysis be used to help determine the appropriate Corps minimum hopper dredge fleet and how the fleet is managed. (Refer below to 9.)

1. The GAO report should recognize and account for the congressional mandate regarding using private contactors for dredging work. Specifically, the law states that the Secretary of the Army "shall have dredging and related work done by contract if he (the Secretary) determines private industry had the capability to do such work and it can be done at reasonable prices and in a timely manner." The law further states that as private industry reasonably demonstrates its capability to perform the work done by the federally owned fleet, at reasonable prices in a timely manner, the federally owned fleet shall be reduced in an orderly manner, as determined by the Secretary, by retirement of plant. Again, Congress in 1996 said "The Secretary shall initiate a program to increase the use of private-industry hopper dredges for the construction and maintenance of Federal navigation channels." (See appendix 1.)

2. DCA maintains that the Corps receives adequate updated contractor cost information in its districts through claims and other audit-related activities. This information should be coordinated and distributed through Corps headquarters for the benefit of all districts. DCA wants to ensure that current cost information is used because the industry faces increasing labor, fuel, maintenance, and insurance costs. DCA would welcome the opportunity to work with the Corps to help ensure that updated cost data is applied to cost estimates across all Corps

districts. It is important to remember that under law [33 U.S. Code § 624(a)(2)] and Corps policy the 'fair and reasonable' estimate is *not* written for the least costly producer for a particular job or for the dredge that is closest to the job, but for a "well-equipped contractor." (See appendix 2.)

3. DCA agrees that the Corps should use its existing policy—Corps' Engineering Regulation 1110-2-1302—for calculating mobilization (transit) costs in developing cost estimates. DCA considers this policy appropriate and reasonable. As noted in the GAO draft report, this policy calls on the Corps to base mobilization costs on a radius for a normal area of operations from the project site that includes a reasonable number of bidders. Concern about estimating mobilization costs is primarily an issue in only one region—the West Coast. A management option the Corps should explore to help address this issue would be to combine several solicitations into a single solicitation. (See appendix 3.)

4. For the 10-year period beginning in 1993 when scheduled work reductions for the Corps hopper dredges began, there has been an increase in the number of private industry hopper dredges available to bid on Corps projects from 14 to 16 vessels. There have been two new hopper dredges built (*Bayport* and *Liberty Island*), a substantial investment in, and redeployment of, the *Columbia*, the return of the *Stuyvesant* to the U.S. hopper market in 1995, and other capacity improvements since 1993. (See appendix 4.)

5. For the 10-year period beginning in 1993 when scheduled work reductions for the Corps hopper dredges began, there has been a significant increase in private hopper dredging capacity from 59,710 cubic yards in the period 1993 through 1994 to 81,150 cubic yards by the end of 2002, a 36 percent increase. This includes an overall increase in capacity of 10,240 cubic yards since the *Wheeler* went into ready reserve at the beginning of fiscal year 1998, a 17 percent increase. (See appendix 5.)

6. Since the Corps hopper dredge *Wheeler* was placed in ready reserve beginning in fiscal year 1998 and the private industry hopper dredges *Bayport* and *Liberty Island* began service in 1999 and 2002, respectively, there has been an increase in the number of bids per Corps solicitation, an increase in the percentage of Corps solicitations with three or more bids, an increase in the number of winning bids that were below the Corps cost estimate, a decrease in the winning bid as a percentage of the Corps cost estimate, and an increase in the percentage of winning bids that were below the Corps cost estimate. DCA recognizes that the year-to-year variations in the data are largely due to fluctuations in Mississippi River levels and when those fluctuations occurred during the year. DCA believes that future data will confirm the shift over the last several years in increasing competition, especially since the *Liberty Island* has not yet completed a full fiscal year in service. (See appendix 6.)

DCA

7. The historical data do not generally indicate that the private hopper dredging industry submits fewer bids per Corps solicitation when it "expects" to dredge more material in a given year. Specifically, the GAO draft report provides an example to support this position that in fiscal year 1991, when the Corps estimated that 31.3 million cubic yards of maintenance material would be contracted out to the private sector the average number of bids per solicitation was 3.2, while in fiscal year 1998 when the Corps estimated that 53.7 million yards of maintenance would be contracted out, the average number of bids per solicitation was 2. However, in fiscal year 2001 when the Corps indicated that nearly 60 million cubic yards would be dredged, the average number of bids was 3.1, essentially the same as for fiscal year 1991. DCA also maintains that it is difficult for industry to know how much material it "expects" to dredge and that such projections do not influence the future number of bids. (See appendix 7.)

8. DCA contends that for the 10-year period beginning in 1993 when scheduled work reductions for the Corps hopper dredges began, there has been an increase in the number of companies competing on a nationwide basis from four to five. While it is true that seven companies were in existence, only four competed on a national basis. Two companies (Manson Construction Co. on the West Coast and B+B Dredging on the Great Lakes) competed solely on a regional basis and one company (Stuyvesant Dredging Co.) had withdrawn its equipment from the market. Since the reduction of scheduled work for the *Wheeler*, which triggered industry investment, there are now five companies competing on a nationwide basis with an accompanying increase in the number of bids received per Corps solicitation. In conjunction with the development of the industry, the Industry-Corps Hopper Dredge Management Group (ICHDMG) has provided for a national focus and worked to maximize utilization of available resources and provide more rapid response to urgent and emergency dredging needs. (See appendix 8.)

9. To adequately perform any analysis, the Corps should have complete and reliable data. This would include, among other things, inputting correct information in the districts for items such as the total cubic yards actually dredged and dredge type. Corps headquarters needs additional resources to help ensure that data is inputted correctly by the districts into their database. DCA welcomes better characterization of urgent and emergency response outcomes. A system should be developed to capture the nature of the emergency and a post facto analysis of the cost and adequacy of the response. DCA also welcomes the opportunity to work with the Corps to make these improvements. (See appendix 9.)

DCA generally agreed with our recommendations. However, DCA strongly believes that reducing the scheduled use of the Corps' hopper dredges has resulted in proven benefits. DCA stated that available information and data show that benefits have resulted. However, we believe the relationship between the restrictions on the Corps' hopper dredge fleet and benefits to the government remains unproven. First, the extent to which use restrictions on the Corps' vessels were a factor in industry's investment decisions to increase its fleet size and add dredging capacity is unclear. Second, the analysis provided by DCA to support its claim is not persuasive; it covered an insufficient period of time and presented data in a potentially misleading fashion. Specifically, DCA only included data for activities that occurred after the implementation of the first restriction on the Corps' dredges. We believe that an analysis of the effects of the restrictions should include data covering the period before and after the restrictions because the time period before restrictions establishes the appropriate baseline to compare changes resulting from the restrictions.

Discussed below are our corresponding detailed responses to DCA's nine numbered comments in the three-page attachment to its letter. DCA also provided 21 pages of appendices, which we have not included in this final report because of the length. However, we have considered all of DCA's comments in our response.

1. We have added language to expand our description of the legislation enacted in 1996 that further increased the role of private industry in hopper dredging.

2. We disagree that the Corps receives adequate, updated contractor cost information through claims and other audit-related activities. As part of this process, industry only provides the Corps updated information to support specific costs that they believe are outdated. They are not required to provide updated information for all costs. In addition, the updated information obtained through claims and other audit-related activities do not ensure that data are collected consistently for each of the vessels. For a vessel involved in multiple claims, the Corps may have more up-to-date costs than a vessel with fewer claims. DCA stated in its comments that current cost information should be used because industry faces increasing labor, fuel, maintenance, and insurance costs. As mentioned in our report, the Corps adjusts estimated costs annually to reflect current price levels. These adjustments, however, do not account for fundamental changes, such as a vessel reaching the end of its depreciable life, which may also affect the

cost estimate. For example, according to a Corps official, industry vessels are depreciated over 20 to 25 years. In 2003, 9 of the 16 industry vessels were 20 years or older and thus, may be nearing the end of their depreciable lives. Unless the Corps has updated data for all costs and for all industry vessels, there is no assurance that the Corps' cost estimates are a reliable tool for determining whether industry's bids are within 25-percent of the government estimate as required by law.

3. As our report recommends, we believe the Corps should examine its policies related to calculating transit costs. We agree that DCA's suggestion is one of several possible options for addressing this issue.

4. The extent to which the restrictions on the Corps vessels caused industry to make the investments that DCA cited as proven benefits is unclear. First, representatives of the dredging firms told us the restrictions were only one of several factors they considered before building or acquiring additional vessels, including the construction of the *Bayport* and *Liberty Island*. Second, firms must routinely replace and update equipment to remain competitive in any industry. While DCA stated that there was a substantial investment in the *Columbia* following restrictions, the vessel was originally built in 1944 and designed to transport military equipment during World War II. We believe it is plausible that the restrictions on the Corps' vessels may have contributed to industry's investment decisions; however, it is unclear to what extent the restrictions contributed to these decisions.

5. While private industry has added capacity, we question the basis for DCA's calculation of the exact change in capacity and the degree to which the capacity increases are attributable to restrictions on the Corps' hopper dredges. Over half of the increase in capacity cited by DCA is attributable to the return of one vessel—the *Stuyvesant*—to service in the United States. However, the *Stuyvesant* worked in the United States prior to the restrictions, and thus it is questionable whether this constitutes an increase in capacity. With regard to the portion of capacity increase due to the construction of the *Bayport* and the *Liberty Island*, as previously stated in response 4 above, the owners of these vessels said the restrictions were only one of several factors they considered in their decisions to build these two vessels. For

these reasons, we believe it is questionable whether the capacity increases cited by DCA are proven benefits of the restrictions.

6. We believe that DCA's claims are based on incomplete information and can be misleading because its analysis only included data after the implementation of the first restriction in fiscal year 1993. As a result, DCA only examined the marginal effects after the *Wheeler* was placed in ready reserve, but not the effects of all the restrictions. We believe a more appropriate analysis of the effects of the restrictions would compare data covering the periods before and after all restrictions because the time period before restrictions establishes the appropriate baseline to compare changes resulting from the restrictions.

   The following example illustrates how not examining the entire time period before and after all restrictions may produce incomplete and misleading results. We found that the percentage of bids less than the Corps' cost estimate was 55 percent after the fiscal year 1993 restriction went into effect (fiscal years 1993 through 2002) and 58 percent after the Wheeler was placed in reserve (fiscal years 1998 through 2002). This finding is consistent with DCA's claim, and taken alone could be viewed as an improvement. However, prior to the 1993 restriction (fiscal years 1990 through 1992), 76 percent of the winning bids were less than the Corps' cost estimate. Thus, although there has been an increase in the percentage of bids less than the Corps' cost estimate following reserve of the *Wheeler*, this change is significantly less than what occurred before the restrictions.

   Furthermore, in an appendix to its comments, DCA criticized our approach of presenting data as averages across a number of years to assess the effects of the restrictions, and argued that a year-to-year evaluation should be used. However, in addition to restrictions on the Corps' fleet, a number of other factors can lead to changes in the number of bids per solicitation and winning bid relative to the Corps' cost estimate from one year to the next. For example, high water flows in the Mississippi River can result in high accumulation of material at the mouth of the Mississippi River and increase the demand for time-sensitive dredging requirements. During such periods, the winning bids relative to the Corps' cost estimate may increase. However, the information necessary to control for these factors is unavailable. For example, the Corps does not collect data on time-sensitive dredging needs. As a result,

we believe that presenting changes as averages across a number of years is more appropriate because it mitigates for the annual variability in the factors that can also affect the number of bids per Corps solicitation and winning bid relative to the Corps' cost estimate.

7. We disagree with DCA's comment. In fact, the historical data do indicate that, in general, in years when more material is available to industry, industry submits fewer bids per Corps solicitation. The information presented in figure 3 in our report, shows that there is an inverse relationship between the estimated volume of material dredged and the annual bids per solicitation, which is statistically significant at the 95 percent confidence level.

8. DCA agreed that seven companies operated in the U.S. hopper dredging market prior to the fiscal year 1993 restriction, while five companies remain in the market today. However, DCA stated that the number of companies competing on a nationwide basis has increased from four to five in the last 10 years. Regardless of whether dredging firms operated on a regional or national basis, prior to the restrictions seven firms provided hopper dredging services and now there are five firms. Furthermore, as recognized in our report, the consolidation in the industry does not necessarily mean that competition has been reduced because the new industry structure could have resulted in enhanced capacity, flexibility, and efficiency for the remaining firms. Moreover, regardless of the number of firms in the industry, DCA acknowledged that the number of bids is more indicative of competition than merely the number of companies. As stated in our report, the number of industry bids per Corps solicitation has decreased on a nationwide basis from approximately 3 bids in the 3 years prior to the restrictions (fiscal years 1990 through 1992) to roughly 2.4 bids in the period following the restrictions (fiscal years 1993 through 2002).

9. We agree with DCA's comment, which is already addressed by our recommendations.

Appendix V: GAO Contact and Staff Acknowledgments

GAO contact

Barry T. Hill, (202) 512-3841

Acknowledgments:

In addition, Chuck Barchok, Diana Cheng, Richard Johnson, Jonathan McMurray, Ryan Petitte, and Daren Sweeney made key contributions to this report.

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