

MILITARY USE OF THE INLAND WATERWAY SYSTEM

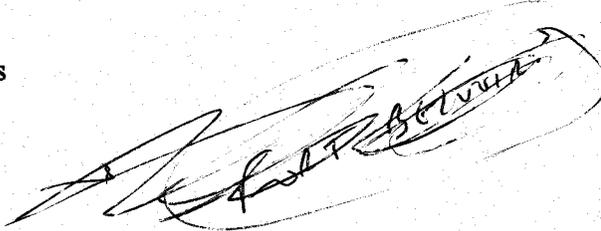
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FOREWORD

The U.S. Army Corps of Engineers has developed and operates over 10,000 miles of inland waterways in the U.S. Private carriers move over 600 million tons of traffic on the system annually, and provide low cost transportation to shippers who want to move big loads long distances. Savings to shippers average over \$8 per ton over the cost of shipping by alternative modes.

The armed forces utilize waterway transportation extensively to transport petroleum, oils, and lubricants (POL). Recently, the logistic, security, and cost advantages of waterway transportation of military units equipped with heavy oversized track or wheeled vehicles has been rediscovered. Routing on waterways can often achieve improved dependability in transit time, lower security risk, enhanced training opportunities, and significant savings in both transit and up/down loading costs.

The purpose of this report is to help put the advantages and problems of waterway transportation of military equipment, including containerized impediments, in perspective, and aid private industry, towing companies, port and terminal operators, and military users to effectively utilize this large national transportation asset.

Mr. John Sparlin, Planning Division, Tulsa District Corps of Engineers (918-669-7546) prepared this report while on a developmental assignment in the Navigation Division, U.S. Army Corps of Engineers Institute for Water Resources. He is the most informed individual in the Corps with respect to issues and opportunities for reducing the costs and achieving high performance results for transporting military unit equipment and impediments.

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CHAPTER 1 INTRODUCTION

Purpose: This report has been prepared to assist Installation Transportation Offices (ITO), Mobilization and transportation planners, logisticians, and private industry to facilitate the use of the Inland Waterway System (IWS) of the United States. This report focuses on the Active Army and Army Reserve Components. All of the Services can use this report and the omission of references to the other Services in no way implies that the information contained herein does not apply equally to all. As it happens, recent experience has been initiated by the Army.

Background: The Inland Waterway System (IWS) originated in the early 1800's when extensive construction was done to improve the waterways largely driven by pressure for westward movement of people and goods. Its main features include locks and dams, channels and ports. Appendix A shows the system configuration.

CHAPTER 2 RECENT EXPERIENCE

In an effort to improve transportation efficiencies, during the summer of 1986 the Oklahoma Army National Guard executed a small movement of equipment over the McClellan-Kerr Arkansas River Waterway. This move originated at the Camp Gruber training Site near Muskogee, Oklahoma and traveled about 100 river miles downstream to Fort Chaffee, Arkansas. Corps of Engineers' equipment consisting of a 600-horsepower towboat and two flat-deck work barges were used as the transport vehicles. Equipment manifest included one Armored Vehicle Launched Bridge (AVLB), two M1109 Armored Personnel Carriers, and two Combat Engineer Vehicles.

Other moves include: The first Bn of the 142 Field Artillery, Arkansas Army National Guard, moved round-trip from Ft. Chaffee, AR to Camp Grayling, Michigan in 1987 a distance of 1800 miles one-way. The 189 Field Artillery, Oklahoma Army National Guard took a batallion round-trip to Camp McCoy, Wisconsin covering a one-way distance of 1200 miles. The 20th Engineer Bn moved about 112 pieces of heavy Engineer equipment from Ft. Campbell, KY onboard an ocean going barge to Belize in Central America. Perhaps the most significant user since 1987 is the 101st Airborne (AASLT). They have moved entire brigades on the Inland System several times. Some 18 various moves by differing units have occurred since the Oklahoma move in 1986.

The largest move to date has been executed by the 101st. In that move, the outfit deployed a brigade task force from Old Lock C on the Cumberland River, about 10 miles from Ft. Campbell, to the Port of Alexandria, LA on the Red River for an exercise at Ft. Polk. They transported 957 pieces of equipment, including 98 containers on board 48 deck barges. All of the equipment was loaded in 28.5 hours. They departed the load-site on 9 May and arrived at their destination on 13 May.

During 1993-94 the 101st has used the IWS extensively transporting their equipment from Ft. Campbell, Kentucky to Fort Polk, Louisiana using the Port of Alexandria, Louisiana as their destination. Their activities are associated with Joint Readiness Training Command Activities (JRTC).

CHAPTER 3 PHYSICAL SYSTEM

Channels and Locks: The system channels are generally north-south oriented with the main-stem Mississippi as the major trunk. There are 27 waterways and they have been aggregated into nine major segments: Ohio River System; Lower Mississippi; Middle Mississippi; Upper Mississippi; Gulf Intracoastal Waterway (GIWW); Atlantic Intracoastal Waterway (AIWW); Mobile & tributaries; Columbia-Snake; and Illinois Waterway. Channel depths are 9 to 14 feet. The nine segments have a total length of about 11,000 miles.

There are 168 commercially active locks with 211 chambers in the nine segments. Twenty-five chambers are 1,000 to 1,200 feet long (12%). There are 114 chambers 600-999 feet long (54%). There are 72 chambers less than 600 feet long (34%).

Ports, Terminals and Docks: Maritime Administration studies have identified over 175 ports with over 1,500 separate terminals. In addition to these the U.S. Corps of Engineers and the U.S. Coast Guard maintain some dock facilities and marine terminals. Many facilities are private but there are docks and terminals operated by port authorities (quasi-public entities). Indiana, Georgia and Alabama operate state-owned docks. Some twelve strategic ports have been identified in the U.S. For the military, Beaumont, Texas on the Gulf coast is an important port of embarkation. Most of these are the larger east/west coast ports.

Towboats & Barges: There are over 40,000 tugs, towboats and barges that operate on the system. Towboat horsepower ranges from small harbor craft in the 200-600 horsepower range to big line boats in the 4,000 to 9,000 horsepower range. The dry-cargo barge fleet is composed of hopper, covered hopper, and deck or flat barges. There are also tanker barges for liquids. This equipment is scattered throughout the system and moves around as the demands of business dictate.

CHAPTER 4

THE ARMY STRATEGIC MOBILITY PROGRAM

The Army's Strategic Mobility Program (ASMP) is the Army's plan to implement the recommendations of the Mobility Requirements Study which was done in 1992.

While the overall study is lengthy and not relevant in total for this Guide, a summary of the major elements is relevant and is as follows:

- Build or convert up to 20 large, medium speed, roll-on/roll-off ships for both surge and prepositioning.
- Deploy an afloat package of Army combat, support, and port-opening equipment by 1997.
- Expand and increase readiness of the Ready Reserve Force from 17 to 36 Round-out units by FY96.
- Continue the C-17 (large transport airplane) program.
- Improve specific components of the transportation system of the United States.
- Purchase approximately 12,000 containers during the FY93-99 timeframe
- Acquire and preposition over 1,000 railcars between FY93-99. Cars to be positioned at key installations and Army Material Command (AMC) Munitions Depots for basic load and sustainment requirements.

ASMP Designated Installations: The following installations have been designated at the present time as key installations and are central to the logistic and transportation planning of the Army at this time:

- Fort Hood, Texas
- Fort Stewart, Georgia
- Fort Benning, Georgia
- Fort Bliss, Texas
- Fort Drum, New York
- Fort Bragg, North Carolina

The installations that have direct access to the IWS are:

Fort Benning, Georgia, near the head of navigation on the Apalachicola, Chattahoochee, Flint (ACF) rivers. The ACF is 297 miles in length and has three locks. The lock size is 82' x 450' and the total lift is 146 feet. These locks were built between 1954 and 1963. The mouth of this waterway intersects with

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the Gulf Intracoastal Waterway (GIWW) between Carrabelle and Port St. Joe, Florida. From that point one could travel by water to any destination among the various States served by the IWS or to any Gulf Coast POE.

Fort Campbell, Kentucky, adjacent to the Cumberland River.

This is the home of the 101st Airborne (AASLT). This outfit has been a user and a proponent of the IWS since their first move in 1987. They load out from an old lock wall known as "Old Lock C" at river mile on the Cumberland. Downstream they travel to the Ohio River and then a short distance to the Mississippi River. From that point they can travel anywhere on the IWS or any Gulf Coast POE. Indeed their use has been extensive.

Fort Knox, Kentucky, near Louisville and with direct access to the Ohio River. From that point, a unit could travel anywhere by water on the IWS including any POE on the Gulf coast.

Fort Bragg, North Carolina, lies near the navigable Cape Fear River which flows downstream directly to the Atlantic Intracoastal Waterway.

Fort Rucker, Alabama, close to the ACF waterway. This waterway also serves Fort Benning, discussed above.

Fort Stewart, Georgia, is very close to the navigable Savannah River the mouth of which intersects with the Atlantic Intracoastal Waterway (AIWW).

Fort Gordon, Georgia, near Augusta and the head of navigation on the Savanna River.

Other Major Installations: A number of other major Army installations have varying degrees of access to the IWS but are not presently specifically named as key installations in the ASMP. That certainly does not mean that they are not candidates for use of the IWS. Appendix B shows these and other installations.

Those installations are:

Fort Lewis, Washington, is adjacent to Puget Sound, and has direct access to the Pacific Ocean.

Fort McClellan, Alabama, is within about 100 miles of the Black Warrior-Tombigbee Waterway (BWT) near Birmingham. Downstream on this navigable channel, the BWT intersects the GIWW and has access to the entire IWS and any Gulf POE.

Fort Benjamin Harrison, Indiana, while not "close" it is certainly within range of the Ohio River immediately to the south and could use the IWS in an intermodal context in truck-barge combination for containers or specialized equipment movements. A truck-barge combination might be just as efficient and cost/time effective as a line haul to a Gulf POE.

Fort McPherson, Georgia, lies near Atlanta with the head of navigation on the ACF Waterway directly to the south. Again, a truck-barge or intermodal haul to a Gulf POE may be just as efficient as a line haul on a single mode.

Fort Drum, New York, lies near Lake Ontario between the St Lawrence Seaway and the New York State Barge Canal.

Forts Hood and Bliss, Texas, are both key installations but are not in close proximity to the IWS.

CHAPTER 5 THE ACTIVE ARMY

The United States Army has changed, and is changing with the end of the cold war. Down-sizing continues as the Army evolves into a more efficient institution.

The Army position, taken from a recent briefing package supplied by the Strategic Mobility Division, Office of the Deputy Chief of Staff for Logistics, (DCSLOG) U.S. Army, The Pentagon, states:

"The Army must provide a Corps of five Divisions that is tailorable, sustainable, and with Airborne, vertical insertion capability. The lead Brigade must be on the ground by C+4, the lead Division by C+12.

Two heavy divisions (sealifted) arrive from CONUS by C+30. (ArmoredMechanized, Air Assault, (mix per CINC)). The full Corps (five divs and a COSCOM) closes by C=75. A fully supported heavy combat brigade, with sufficient supplies to sustain the Corps until lines of communication are established, must be prepositioned afloat."

CHAPTER 6

RESERVE COMPONENT FORCES

The total force changes of the past five years have made a very different picture of the Army and Air National Guard of today. Force structure changes, mission realignments, and lower end strength have had a very strong impact not only on the individual Guard member but also on the leadership of each State. It is important to note that in peacetime the National Guard is under the command and control of the state governors. The state Adjutant Generals lead the Guard.

Actions affecting the Army National Guard and the Army Reserve, and the leadership of these organizations, are vested in the Chief, National Guard Bureau and the Chief, Army Reserve. Though some units are maintained at higher levels of readiness than others, all are expected to meet minimum Army training and readiness standards. Contingency Force Package units and enhanced readiness brigades will be early deployers in the war planning sequence.

The National Guard reserve component forces are organized into six areas within the continental United States (CONUS). Plate 1 shows those areas. The situs of the IWS is predominately in the eastern half of the U.S. and as such areas one thru five are of primary interest to this Guide. Area Six, encompassing about the western 40 percent of the Nation does have the Columbia/Snake system which serves the States of Washington, Oregon and western Idaho. The Sacramento River serve parts of western California.

Each state within its respective areas has a complement of major commands. Some states have more commands than others. Table 1 shows the Major Commands. Within those major commands there are many component units and their place in the Contingency Force Pool (CFP) differs. Some of those units will have a high priority and will be early deployers while others will not. It is beyond the scope of this report to identify each component unit; indeed some of that subject matter is classified.

Users of this report within the Active Army and National Guard will of course know where they stand in the CFP. Generally, Field Artillery, Engineer heavy units, Multiple Launch Rocket System Units (MLRS), Armored and Cavalry units, and even straight-leg infantry units will have a lot of equipment and containers that can be transported over the IWS.

Table 1
Probable Contingency Force Pool (Cfp) Units
Army National Guard Major Commands

AREA I

43rd Inf Bde	CN
26th Inf Bde	MA
253rd Cmbt CommGp	MA
240th Engr Gp	ME*

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197th FA Bde	NH
50th Armored Bde	NJ
42nd Inf Div	NJ
42nd Inf Div Mech	NY
27th Inf Bde	NY
103rd FA Bde	RI
86th Armored Bde	VE

AREA II

123rd Armored Bde	KY	
138th FA Bde	KY	has a MLRS Bn
149th Inf Bde	KY	
35th Inf Div	KY	
29th Inf Div	MD	
30th Eng Bde	NC	
30th Inf Bde	NC	
37th Armored Bde	OH	
16th Eng Bde	OH	
28th Inf Div (hvy)	PN	
111th Eng Group	WV	
29th Inf Div (lt)	VA	
29th Div Arty	VA	
176th Engr Group	VA	

AREA III

31st Armored Bde	AL
53rd Inf Bde	FL
164th AirDef Arty	FL
48th Inf Bde	GA
265th Eng Group	GA*
278th CCav Reg	TN
196th FA Bde	TN
194th Eng Bde	TN
218th Heavy Bde	SC
151st FA Bde	SC
263rd Air Def Bde	SC

AREA IV

142nd FA Bde	AR
35th Inf Div	KN
256th Inf Bde (mec)	LA
225th Eng Group	LA
155th Armored Bde	MS

631st FA Bde	MS
184th Trans Bde	MS
168th Engr Group	MS *
35th Eng Bde	MO
35th Eng Bde	MO
135th FA Bde	MO
45th Inf Bde	OK* (120th Engrs)
45th FA Bde	OK MLRS Bns (158 & 171 FA)
49th Armored Div	TX

AREA V

33rd Inf Bde	IL
66th Bde	IL
38th Inf Div	IN
34th Inf Div	MN
46th Inf Bde	MI MLRS Bn
164th Eng Group	ND
35th Inf Div Mec	NB
147th FA Bde	SD
109th Eng Group	SD
32nd Inf Bde mec	WI
57th FA Bde	WI
264th Eng Group	WI

AREA VI

40th Inf Div Mech	CA
169th FA Bde	CO
153rd FA Bde	AZ
116 Cav	ID
163rd Armored Bde	MN
41st Inf	OR
I Corps Arty	UT
81st Inf	WA
115th FA Bde	WY
49th FA	WY

* Engr Heavy CFP 1 Unit

Source: 10th Yearbook Edition, National Guard, Jan, 1994

Note: Down-sizing, realignment and the operation of BRAC may bring about significant changes in this list.

**Figure 1. The Army and Air National Guard of the 54 States,
Territories, and the District of Columbia**

CHAPTER 7 HOW MOVES OCCUR

Most moves are planned well in advance of actual execution. This is true of both active and reserve units except of course in times of war or emergency when lead time is short. The primary responsibility for moving the military around is the United States Transportation Command (TRANSCOM) and a subordinate Agency, the Military Traffic Management Command (MTMC). The former is located at Scott AFB in Illinois and the latter in Falls Church, Virginia. MTMC has a western area office at Oakland, California and an eastern area office at Bayonne, New Jersey.

Unit moves are requested by the Installation or Unit Transportation Office or officer to the MTMC. This is often done on a standard form or on an Automated Unit Equipment list.

The MTMC prepares the documents, solicits for transportation vendors, makes the award and pays the vendor. The Unit decides when it wants to go and where it wants to go. The MTMC is a service agency. The MTMC may hire trucks, railroads or towing companies. Theoretically any combination could be used in a move. Private sector vendors bid on moves and the bidder is chosen based on the lowest bid.

Recently, MTMC has emphasized total quality and "best value" as a selection criteria. Implied in that are factors which may not be explicit in solicitations for bids such as avoidance of loss during transit, dependability, safety, environmental & energy considerations and other qualitative factors which contribute to good results.

Lowest cost criteria has always been accompanied by other requirements but those criteria have not always been clearly understood by the bidders.

Some transporters, particularly the railroads, file Tenders with MTMC. These Tenders quote a rate for cars and service and are maintained in MTMC files for a specific period. When a transportation request comes in, sometimes the Tender in the file is used to select the bidder. Units can request a particular mode as indeed the 101st has done more than once to move by barge on the IWS.

~~In order~~ to bid on a military move a vendor must first know it is happening and have the equipment to do the job. The military does move itself around also. For example, a unit could negotiate directly with another agency and pay for the move on a Military Interagency Purchase Request (MIPR). This has in fact been done with the Corps of Engineers where Corps floating equipment has been used. This is not a common practice.

In the new, emerging Army, much equipment will be prepositioned at sea and troops flown in to the theatre of operations. Resupply, follow-on force support, depot level resupply, redeployment and demobilization are all candidates for the IWS. During peacetime, use of the IWS has been viable financially and logistically as has been demonstrated by recent experience.

CHAPTER 8 BARGE LOADING OPERATIONS

Docks, Wharves & Load Sites: Most of the military moves that have occurred since 1987 have been from unimproved sites. In these cases, the barges are pushed up against a dirt embankment in a perpendicular manner, held against the bank with the power of the towboat and the equipment driven onto the barge. Sometimes a dirt ramp is pushed up by a bulldozer.

The 101st uses an old lock wall on the Cumberland which amounts to a concrete hard stand. The 189 FA Okla Army National Guard used a roll-on/roll-off (RORO) dock at the Port of Catoosa for a move. There are an almost unlimited number of places where a loading operation could take place along the IWS. Some units have loaded at Corps of Engineer's lock and dam sites along the river e.g., Lock and Dam 7 on the Upper Miss, McAlpine Lock and Dam on the Ohio and the Corps marine facility at Rock Island, Ill.

Locating the loading site can be an easy job or a hard one depending where a move starts and where it is going. People who can assist include IWS towing companies, the Corps of Engineers, and port and terminal operators. Some road-march is always required regardless of mode. That is, it is necessary to get the equipment to the railhead or dock.

Barges & Towboats: Barges are lashed together in various configurations for loading. For transit they are cabled together into a "tow" that is usually three wide and three long. Barges may not all be uniform in size. The common deck size is 35' x 195' or the so-called Jumbo, but a carrier may mix several sizes together for any given move.

Equipment should be driven onto the barge with the heaviest items equally spread port to starboard (left to right) in the rear of the barge with the weight diminishing toward the bow (front). Units usually do their own load planning. Height/weight is not a restraining factor as long as the load is balanced on the barge. In load planning a barge, the planner is concerned only with length, width and approximate balance.

On the IWS, consensus is that tying down the front row and rear row of equipment should be done to minimize the risk of forward dumping in the event of impact with an object while the tow is underway (moving). Vehicles (equipment) should be placed bumper-to-bumper in the string (bow to stern) so that the string is like an integrated monolith. Some feel that the perimeter vehicles should also be tied. All equipment is parked in gear with the hand brake set. For a blue-water move, across the Great Lakes or to Central America for example, each piece should be tied down. A qualified fuel handler should be on board as super cargo and there should be additional fire extinguishers on board.

Towboats that have been used in recent experience range from 4,200 horsepower to 600 horsepower. Generally, 2,000-2,500 horsepower will easily handle an eight-barge tow. The 101st has moved with as many as 48 deck barges in a single move. On the Mississippi, the tows are larger than eight barges and use more powerful towboats.

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Vendors: There are many vendors on the IWS who have yet to bid on a military move. Many do not know where to start. They should be referred to the MTMC.

In actual practice, some vendors have predominantly floating equipment and few or no towboats while others have towboats and few barges. Some companies have both. Many so-called Mom & Pop towing companies can bid on this work but will have to lease barges for the job. They may be at a disadvantage compared to the companies who have both. Appendix C lists some of the larger towing companies on the IWS but is not a complete list. The commercial barge fleet is randomly deployed where business is available. Some deployment to accommodate the military would certainly occur if the business were there.

CHAPTER 9

ADVANTAGES OF BARGE TRANSPORTATION

Users to date, that is since the "rediscovery" in 1987, report no loss of equipment from theft, vandalism or shrinkage. No personnel have been injured. However water, like the other modes, has its hazards and care and safety are essential. The following list is a consensus of the military users enumerating the advantages of using the IWS both with and in lieu of other modes of transportation:

- Up-load and down-load times are much faster, generally about half the time of rail. Bow and stern equipment (load) tie-down should be done.
- In-transit security is very high with no access to the cargo from land. Super-cargo (personnel) can be carried for on-board maintenance and security if desired.
- Fuel can be carried in the vehicles and vehicle height does not have to be reduced. e.g. antennas and windshields can be left erect.
- Military moves have priority passage on the IWS. The Corps of Engineers radio net at the locks and dams allows around-the-clock monitoring of the location and status of the move and equipment thereon.
- Total lapsed time of transit from origin to destination is equal or less than other modes.
- All sizes of equipment can be carried. Units moved include Engineer, Armor, Field Artillery, Infantry and no equipment has been too large or too heavy to move. Indeed, the 101st has moved UH-60 Blackhawk Helicopters and nearly 100 containers at one time on the IWS.
- Loading can be accomplished at unimproved sites at almost unlimited areas along the IWS. Of course commercial docks can also be used.
- Modal competition, particularly between rail and barge, is introduced and experience shows that cost to DoD falls.

CHAPTER 10

CRITERIA FOR TRANSPORT MODE SELECTION

The Military Traffic Command is familiar with rail, truck and air modes of transportation but has limited experience with the Inland Waterways. Appendix D shows comparative tonnage capacity by mode. MTMC's response to interest in IWS movements has been on a case-by-case basis.

Guidance from MTMC on mode selection is contained in its publication: LOGISTICS HANDBOOK FOR STRATEGIC MOBILITY PLANNING, Pamphlet 700-2, (MTMC TEA). A section on Inland Waterways has been included. The general guidance for CONUS moves in that pamphlet is:

- Mode selection should consider economic requirements, availability of assets, hostile threat assessment, and special requirements.
- Transportation options include motor, rail and inland waterways. MTMC has in the recent past identified inland waterways as an option only for equipment that exceeded rail carrier capabilities. That view has been brought into serious question by recent military moves.
- Army units will use commercial transportation during mobilization.
- Sufficient commercial resources must be available.
- MTMC must validate the capability and the major command (MACOM) must approve the move.
- Organic road-marches are authorized when units are located within a one day march to their destination.
- Organic road-marches are also authorized when commercial transportation is not adequate.

Motor Transport: Motor transport is often required for at least some transport of cargo. Size and weight restrictions are major impediments to highway use. Urban congestion is often a major concern and may be a severe restriction in some areas. The Interstate System has legal limits of 80,000 pounds for gross vehicle weight and 8 1/2 feet width and 13 1/2 feet total height.

Compared to these limits more than 25 Army equipment-transporter combinations exceed the legal weight and size limits of the Interstate System. Secondary roads are even more restrictive.

For example, a single Abrams tank transported on the M746-M747 heavy equipment transporter (HET) has a gross vehicle weight of about 200,000 pounds.

Civil highway authorities are reluctant to waive weight requirements and often height is a physical restriction. The shortest over-the-road route may not be available for one or more of the above reasons.

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Railroads: At present, rail equipment is the primary means of transport for CONUS based forces. The rail system is nationwide in situs and there are a variety of flat and other car types. Some flatcars are prepositioned at installations.

Railroads can transport most heavy and some oversize equipment, but there are some restrictions. The railroads have a history of working closely with the MTMC and military units.

Barges: Until very recently the military did not consider the inland waterways as a transport mode option for unit movements. (Petroleum, oil and lubes do move on the IWS) Since 1986 it has been demonstrated that the inland waterways are a viable transport mode for unit movements and that significant cost savings can be achieved with no downside to timelines.

The inland waterways are an effective transport mode and increased use is likely given the demonstrated success of many units since 1986, particularly the large moves of the 101st Airborne (AASLT).

The increased emphasis on intermodal transport, generated by both economic reality and policy may well enhance the use of the IWS for military equipment and container movements in direct competition with railroads.

CHAPTER 11 CONCLUSION

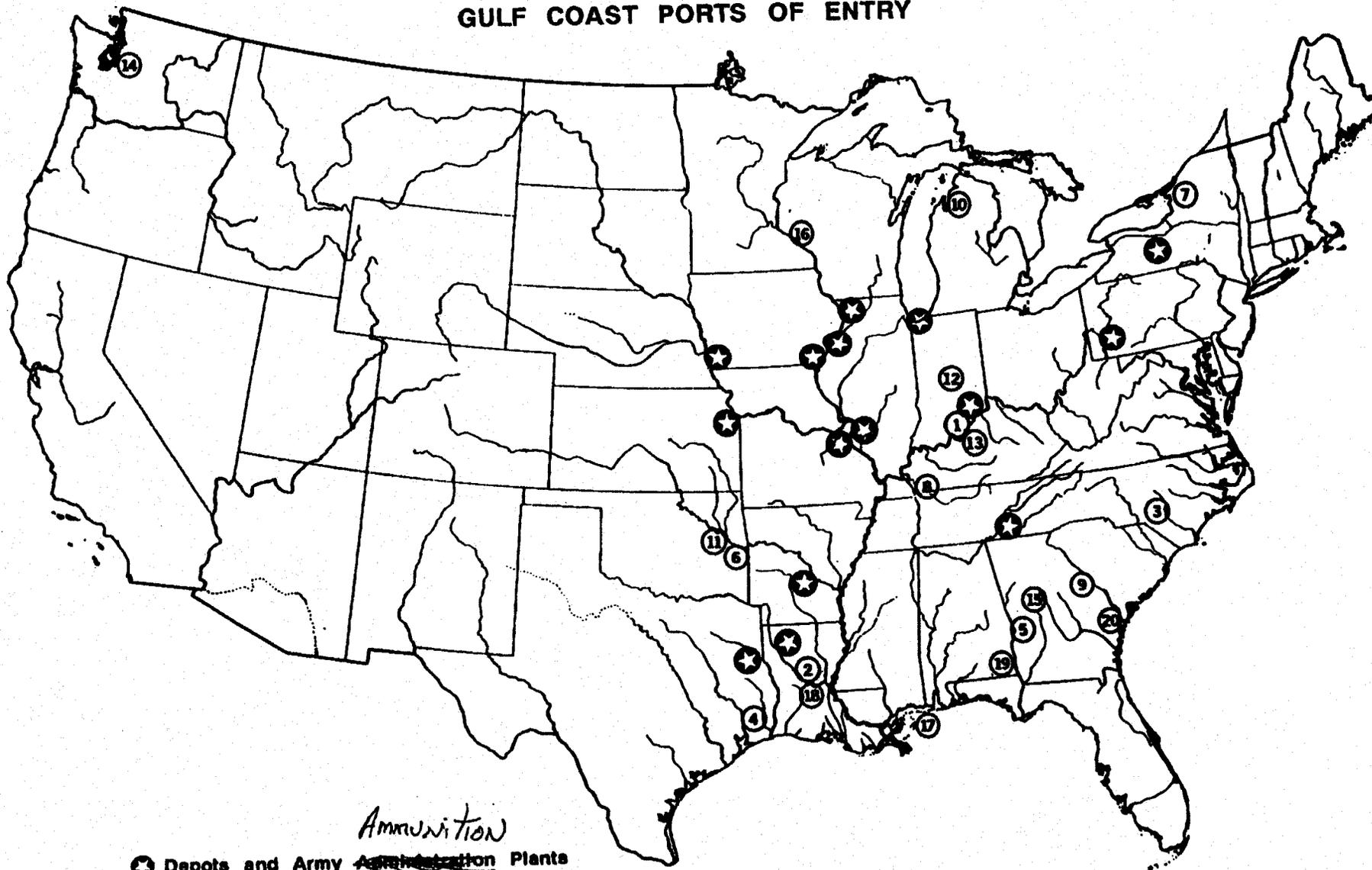
Since 1986, military unit movements have proved that the inland waterway system is a viable mode of transportation. Impediments to continued and expanded use of the IWS include lack of information among the potential military users, the towing industry and port and terminal operators along the system. Most have no prior experience with the military use of the system. In simplest terms, the unknown and limited experience best describe the impediment. In a briefing with MG Fred Elam, the ADCSLOG at the Pentagon in 1993, MG Elam described the system as "a forgotten resource".

Consensus of those military users who have "rediscovered" the ^{INLAND WATERWAY} system report they believe the system is applicable to the following activities:

- Use of the IWS by military units within CONUS for transport to and from training sites, both for Active Army and Reserve Component Forces.
- Use of the IWS for redeployment to home stations within CONUS from ocean ports.
- Use of the IWS for demobilization of forces returning to CONUS from world-wide locations.
- Use of the IWS to transport follow-on force impedimenta to any Gulf coast POE.
- Use of the IWS to transport resupply impedimenta to any Gulf coast POE for shipment to deployed forces worldwide.
- Use of the IWS to transport HAZMAT, ordnance or related items within both CONUS and to POE. (More study needs to be directed toward this particular subject)

The waterways should be viewed as a direct alternative to rail where origins and destinations are accessible within CONUS and particularly to any Gulf Coast POE. The IWS should also be viewed as a viable option for truck/barge combination intermodal movement of containers. Intermodal solicitations from MTMC will lower transportation costs for DoD. Use of the IWS produces environmental benefits and energy savings as well as dollar savings in transportation costs when compared to other modes. Appendix E provides some contacts for additional information.

APPENDIX B
CONTINGENCY FORCE & OTHER INSTALLATIONS
WITH
ACCESS TO INLAND WATERWAYS
AND
GULF COAST PORTS OF ENTRY



Ammunition
★ Depots and Army Administration Plants
(Not a Complete List)

APPENDIX B-1
Key to Appendix B Map

Map Number	
1	Camp Atteberry, IN
2	Camp Beauregard, LA
3	Fort Bragg, NC
4	Beaumont, TX POE
5 *	Fort Benning, GA
6	Fort Chaffee, AR
7 *	Fort Drum, New York
8 *	Fort Campbell, KY
9	Fort Gordon, GA
10	Camp Grayling, MI
11	Camp Gruber, OK
12	Fort Benj Harrison, IN
13	Fort Knox, KY
14 *	Fort Lewis, WA
15	Fort McPherson, GA
16	Camp McCoy, WI
17	Mobile, AL POE
18	Fort Polk, LA
19	Fort Rucker, AL
20 *	Fort Stewart, GA

Note: This list is representative and does not include Depots, AAPs, National Guard equipment sites, and many other installations.
* denotes currently designated Contingency Force Installation. This list is subject to change as a result of BRAC.

APPENDIX E

**INFORMATION AND ASSISTANCE CONTACTS
For
Military Use of Inland Waterways**

Hq. Military Traffic Command
Directorate of Inland Traffic
Nassif Building
Falls Church, VA 703 756 1094

Chief, Installation Transportation Office
Fort Campbell, Kentucky 502 798 3424

Hq. US Army Corps of Engineers
Operations and Readiness Division
20 Mass Ave (Pulaski Bldg)
Washington, DC 202 272 0196

Hq. Camp Gruber National Training Site
Operations Office
Okla Army National Guard
Braggs, Oklahoma 918 487 6001

Chief, Water Resources Support Center
Attn: IWR-N
US Corps of Engineers
7701 Telegraph Rd
Alexandria, VA 22310-3868 703 355 2240

Note: the Corps of Engineers has multi-modal transportation computer cost models available that compare costs from any origin to any destination among modes (excluding air). This service is available on a cost reimbursable basis. Contact Water Resources Support Center.

LIST OF REFERENCES

1. Military Management Traffic Command, Inland Traffic Directorate, Military Utilization of the Inland Navigation System, by C.T. Angelo and others, August 1990.
2. Spaul, P.J., "Reviving Inland-waterways Transport," Army Logician, March/April 1987.
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8. Wollenberg, R.F., Ferguson, W.H., Inland Waterways Deployment Alternative, "Army Logician, July/August 1990.
9. Yates, J.L., "Water move by Active Unit 1st Since WWII," The Waterways Journal, September 11, 1989.
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11. Military Traffic Management Command Engineering Pamphlet 700-2, Logistics Handbook for Strategic Mobility Planning, August 1989.
12. Kertz, Gary W., Role of Inland Waterways System During Mobilization, Masters Thesis, Naval Postgraduate School, Monterey, California, December, 1991.

APPENDICES

APPENDIX B-1

Key to Appendix B Map

Map Number

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9	Fort Gordon, GA
10	Camp Grayling, MI
11	Camp Gruber, OK
12	Fort Benj Harrison, IN
13	Fort Knox, KY
14 *	Fort Lewis, WA
15	Fort McPherson, GA
16	Camp McCoy, WI
17	Mobile, AL POE
18	Fort Polk, LA
19	Fort Rucker, AL
20 *	Fort Stewart, GA

Note: This list is representative and does not include Depots, AAPs, National Guard equipment sites, and many other installations. * denotes currently designated Contingency Force Installation. This list is subject to change as a result of BRAC.

APPENDIX E

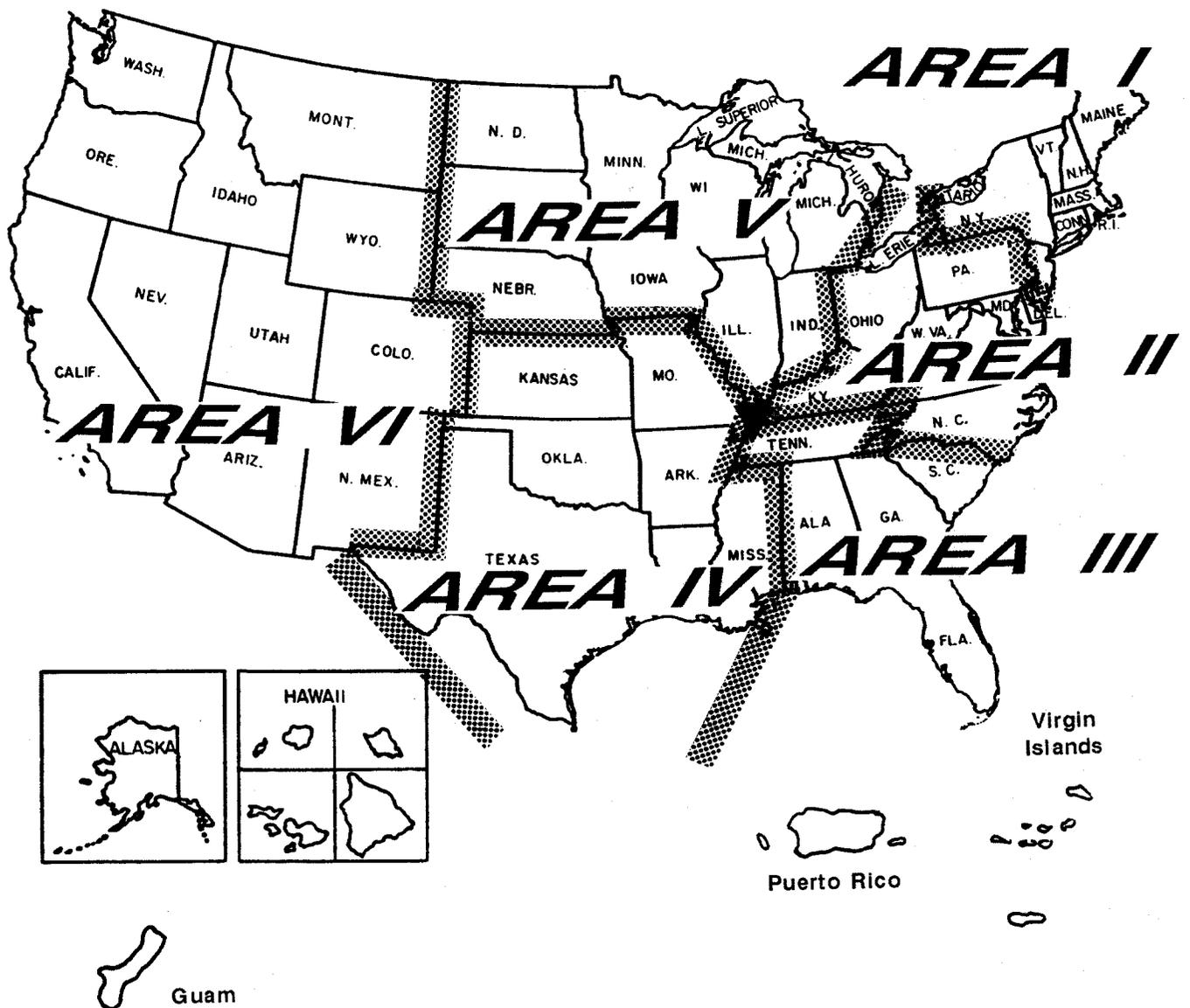
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Hq. Military Traffic Command Directorate of Inland Traffic Nassif Building Falls Church, VA	703 756 1094
Chief, Installation Transportation Office Fort Campbell, Kentucky	502 798 3424
Hq. US Army Corps of Engineers Operations and Readiness Division 20 Mass Ave (Pulaski Bldg) Washington, DC	202 272 0196
Hq. Camp Gruber National Training Site Operations Office Okla Army National Guard Braggs, Oklahoma	918 487 6001
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The Army and Air National Guard

of the 54 States, Territories and the District of Columbia



MILITARY USE OF THE INLAND WATERWAY SYSTEM

by

John A. Sparlin
Chief, Economics Branch, Planning Division
U.S. Army Corps of Engineers
Tulsa District
224 South Boulder
Tulsa, OK 74103-0061

for

U.S. Army Corps of Engineers
Institute for Water Resources
Navigation Division
7701 Telegraph Road
Alexandria, VA 22315-3868

June 1994

IWR Report 94-R-8

CHAPTER 2 RECENT EXPERIENCE

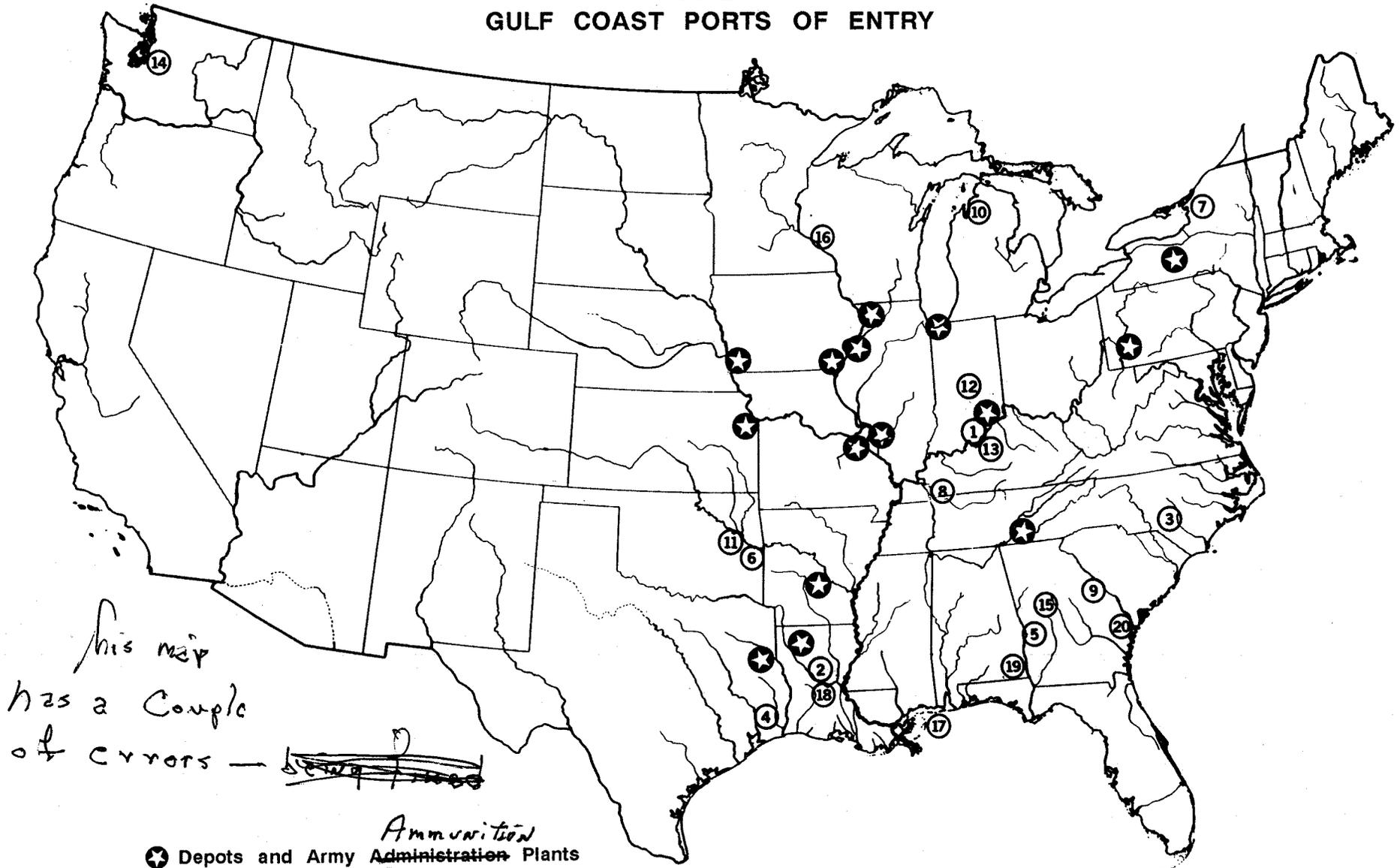
In an effort to improve transportation efficiencies, during the summer of 1986 the Oklahoma Army National Guard executed a small movement of equipment over the McClellan-Kerr Arkansas River Waterway. This move originated at the Camp Gruber training Site near Muskogee, Oklahoma and traveled about 100 river miles downstream to Fort Chaffee, Arkansas. Corps of Engineers' equipment consisting of a 600-horsepower towboat and two flat-deck work barges were used as the transport vehicles. Equipment manifest included one Armored Vehicle Launched Bridge (AVLB), two M1109 Armored Personnel Carriers, and two Combat Engineer Vehicles.

Other moves include: The first Bn of the 142 Field Artillery, Arkansas Army National Guard, moved round-trip from Ft. Chaffee, AR to Camp Grayling, Michigan in 1987 a distance of 1800 miles one-way. The 189 Field Artillery, Oklahoma Army National Guard took a batallion round-trip to Camp McCoy, Wisconsin covering a one-way distance of 1200 miles. The 20th Engineer Bn moved about 112 pieces of heavy Engineer equipment from Ft. Campbell, KY onboard an ocean going barge to Belize in Central America. Perhaps the most significant user since 1987 is the 101st Airborne (AASLT). They have moved entire brigades on the Inland System several times. Some 18 various moves by differing units have occurred since the Oklahoma move in 1986.

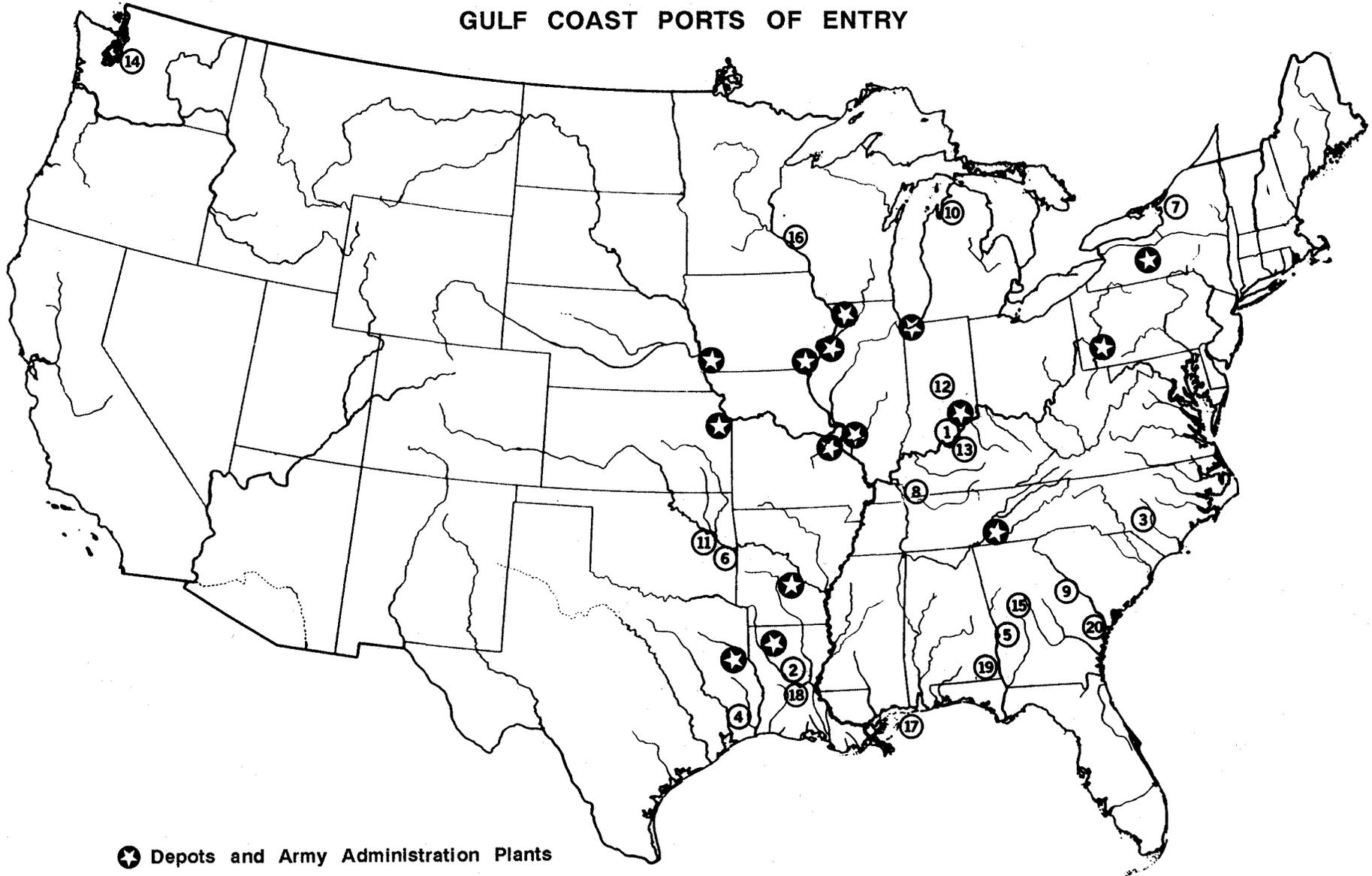
The largest move to date has been executed by the 101st. In that move, the outfit deployed a brigade task force from Old Lock C on the Cumberland River, about 10 miles from Ft. Campbell, to the Port of Alexandria, LA on the Red River for an exercise at Ft. Polk. They transported 957 pieces of equipment, including 98 containers on board 48 deck barges. All of the equipment was loaded in 28.5 hours. They departed the load-site on 9 May and arrived at their destination on 13 May.

During 1993-94 the 101st has used the IWS extensively transporting their equipment from Ft Campbell, Ky to Fort Polk, LA using the port of Alexandria, LA as their Destination. Their activities are associated with Joint Readiness ~~Training~~ Training Command Activities (JRTC).

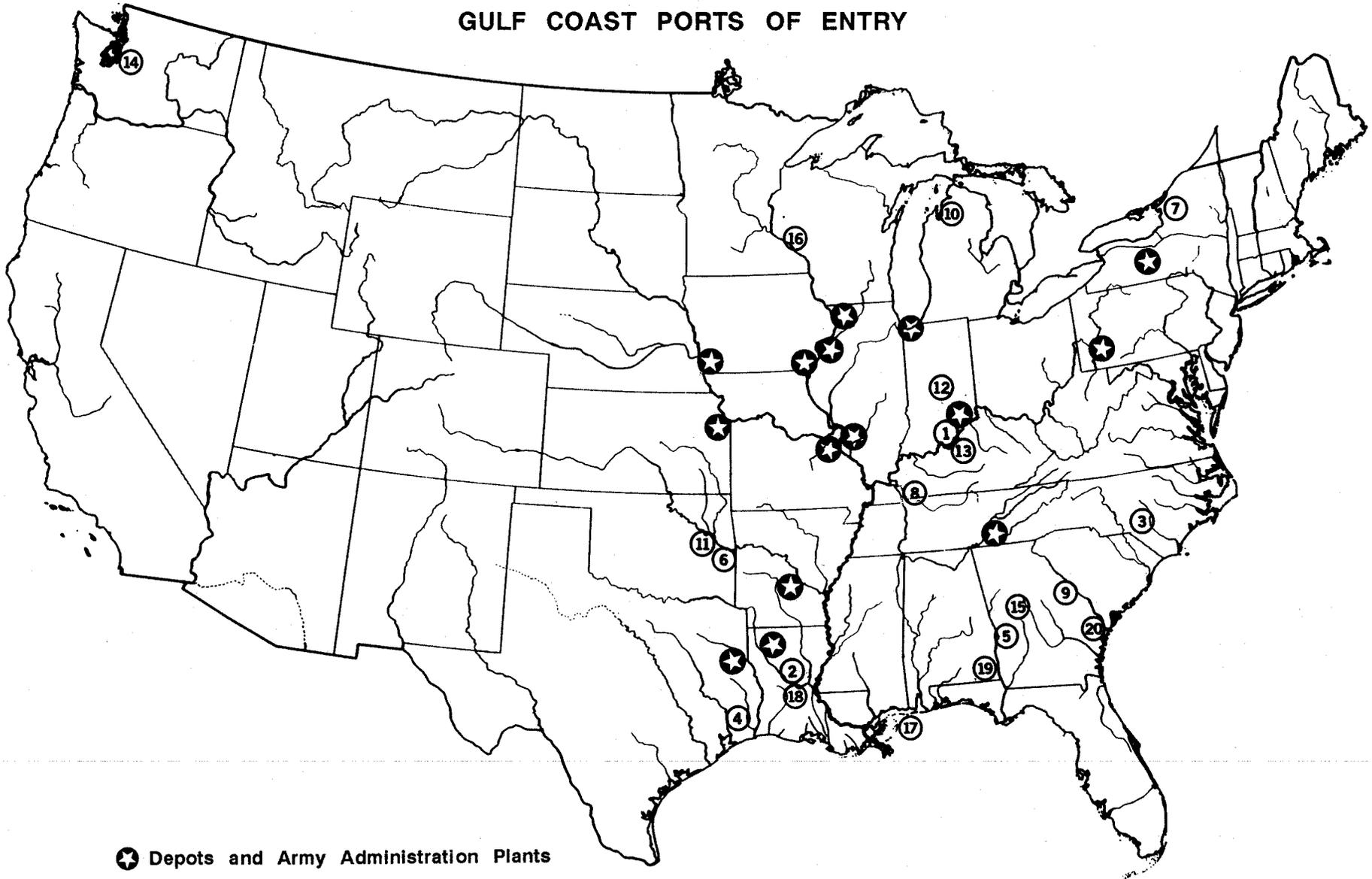
APPENDIX B
CONTINGENCY FORCE & OTHER INSTALLATIONS
WITH
ACCESS TO INLAND WATERWAYS
AND
GULF COAST PORTS OF ENTRY



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CONTINGENCY FORCE & OTHER INSTALLATIONS
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AND
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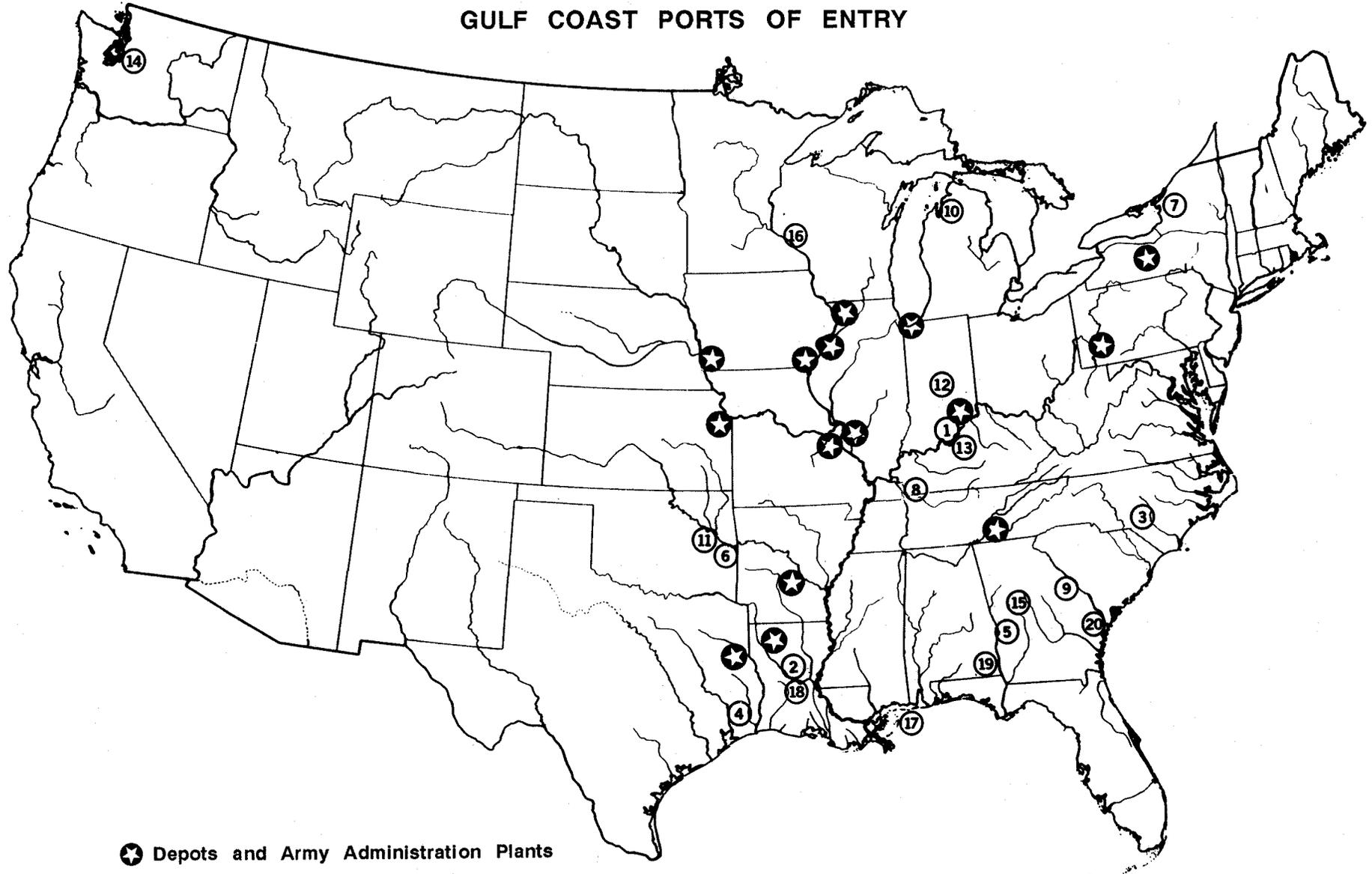


APPENDIX B
CONTINGENCY FORCE & OTHER INSTALLATIONS
WITH
ACCESS TO INLAND WATERWAYS
AND
GULF COAST PORTS OF ENTRY



★ Depots and Army Administration Plants

APPENDIX B
CONTINGENCY FORCE & OTHER INSTALLATIONS
WITH
ACCESS TO INLAND WATERWAYS
AND
GULF COAST PORTS OF ENTRY



APPENDICES

APPENDIX B-1
Key to Appendix B Map

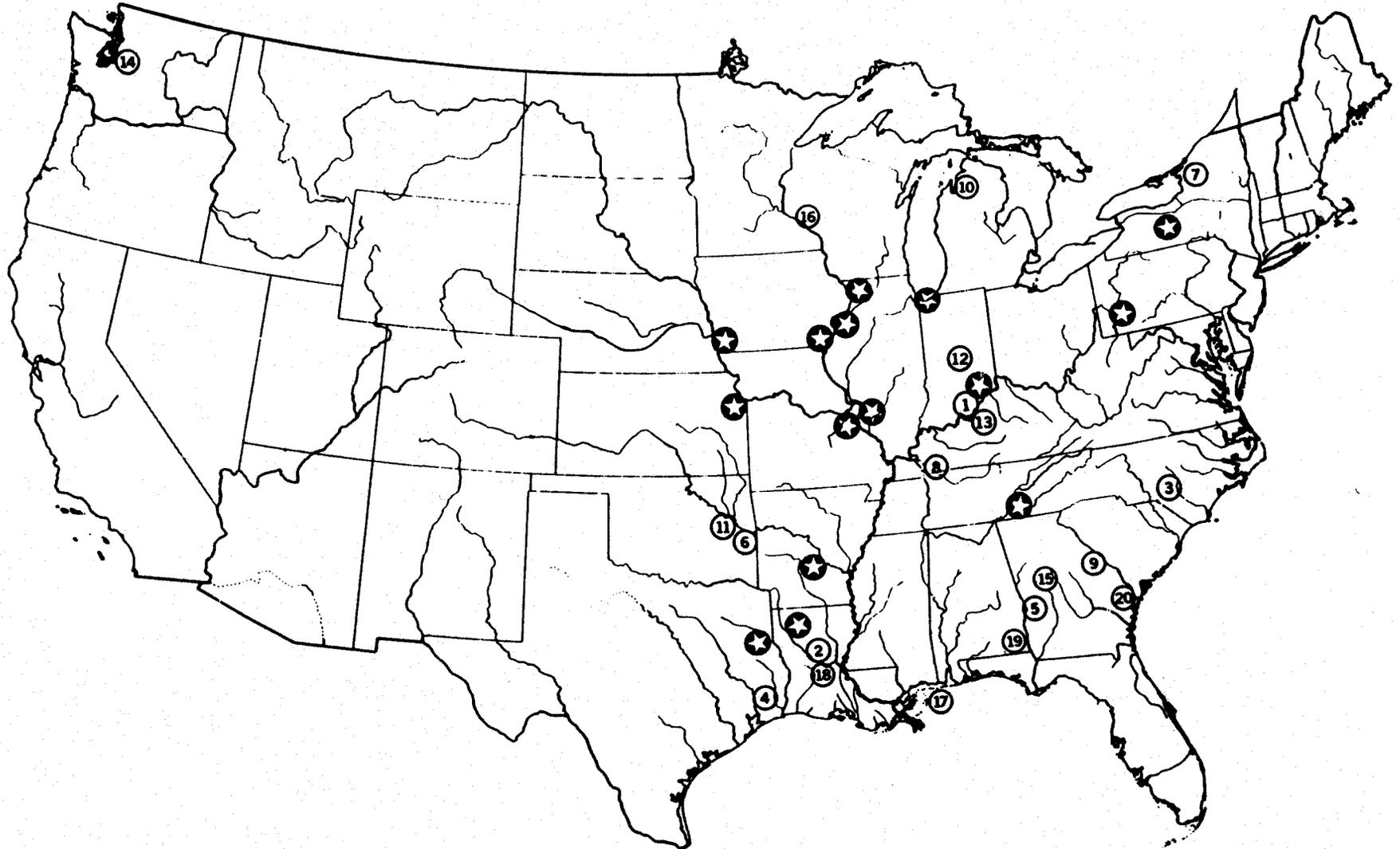
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APPENDICES

APPENDIX A

**APPENDIX B
CONTINGENCY FORCE & OTHER INSTALLATIONS WITH
ACCESS TO INLAND WATERWAYS AND
GULF COAST PORTS OF ENTRY**



★ Depots and Army Ammunition Plants
(not a complete list)

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**APPENDIX C: COMMERCIAL VENDORS WITH 15 OR MORE FLAT/DECK BARGES,
MISSISSIPPI RIVER SYSTEM AND GULF INTRACOASTAL WATERWAY, 1991**

11-May-94

Operator Name	Address	State	Area code	Tel-number	Number of flat/deck barges	Number of towboats	
MCDONOUGH MARINE SERVICE (DIV. OF MARMAC)	2300 SUREKOTE ROAD;NEW ORLEANS;	LA	70117	504	949-7586	490	5
CANAL BARGE COMPANY, INC.	835 UNION ST.;SUITE 300;NEW ORLEANS	LA	70112	504	581-2424	155	20
REED CRUSHED STONE COMPANY, INC.	P. O. BOX 35;GILBERTSVILLE;	KY	42044	502	362-4264	122	4
DAVISON SAND & GRAVEL CO.	THIRD AVENUE AND FOURTH STREET;NEW KENSINGTON;	PA	15068	412	362-4900	89	
PINE BLUFF SAND & GRAVEL CO.	P. O. BOX 7008;PINE BLUFF;	AR	71611	501	534-7120	67	18
DRAVO BASIC MATERIALS CO., INC.	;P. O. BOX 2150;KENNER;	LA	70063	504	468-3247	63	30
DRAVO BASIC MATERIALS CO., INC.	P. O. BOX 156;CHATTAHOOCHE E;	FL	32324	904	663-4566	63	30

APPENDIX C

Military Use of Inland Waterway System

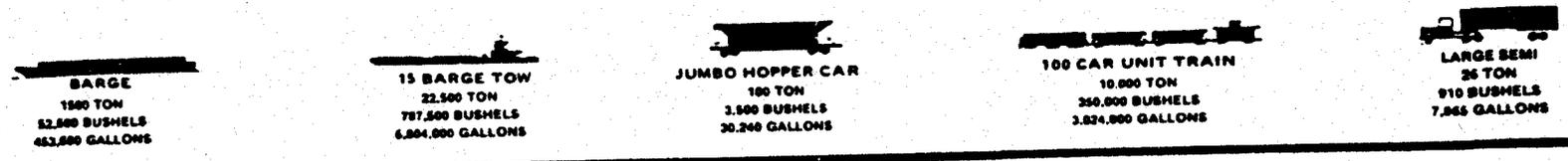
Operator Name	Address	State	Area code	Tel-number	Number of flat/deck barges	Number of towboats
LUHR BROS., INC.	P. O. BOX 69;COLUMBIA;	IL	62236	618 281-4106	59	24
PATTON-TULLY TRANSPORTATION CO.	P. O. BOX 28;MEMPHIS;	TN	38101	901 576-1411	59	19
INGRAM MATERIALS COMPANY	10 FATHERLAND STREET;NASHVILLE;	TN	37213	615 256-0263	41	6
SHELL OFFSHORE, INC. A SUSIDIARY OF SHELL OIL CO.	SHELL BUILDING;P. O. BOX 61933;NEW ORLEANS	LA	70161		38	
DRAVO CORPORATION (AGGREGATE)	ATTN: JAMES DIECKS;222 SECOND ST.;PITTSBURGH;	PA	15225	412 262-8000	34	
INLAND BARGE RENTALS, INC.	HELLENIC BLDG., ROOM 118;MORGAN CITY;	LA	70380	504 384-8885	32	
INGRAM BARGE CO.	;4400 HARDING RD.;NASHVILLE;	TN	37202	615 298-8200	29	53
YAGER MATERIALS, INC.	5001 U. S. 60 EAST;OWENSBORO;	KY	42301	502 926-3611	28	4
PARKER BROTHERS & CO., INC.	P. O. BOX 107;HOUSTON;	TX	77001	713 928-8400	25	8

Operator Name	Address	State	Area code	Tel-number	Number of flat/deck barges	Number of towboats
GREATER CINCINNATI MARINE	P. O. BOX 308;NEWPORT;	KY	41072	606 441-7400	22	9
DAVIS CONSTRUCTION CO., INC.	ATTN: TIM;P. O. BOX 13164;MEMPHIS	TN	38113016 4	901 948-1696	22	7
RICHARDSON, LOYD W., CONSTRUCTION CO.	1054 SOUTH RIFE STREET;ARANSAS PASS;	TX	78336	512 758-5381	21	14
BABCOCK & WILCOX COMPANY	ATTN: LEO JORDAN;1010 COMMON ST.;NEW ORLEANS	LA	70112	504 587-4875	20	2
BRENNAN, J. F., CO.	P. O. BOX 2557;LA CROSSE;	WI	54602	608 784-7173	19	6
WEST LAKE QUARRY AND MATERIALS CO., INC.	12976 ST. CHARLES ROCK ROAD;BRIDGETON;	MO	63044	314 739-1122	19	4
MOLINE CONSUMERS COMPANY	1701 5TH AVENUE;MOLINE;	IL	61265		16	3
DAULTON, GLENN E., INC.	2200 S. WARD AVENUE;CARUTHERS VILLE;	MO	63830	314 333-0380	16	
GRAY, J. R., INC.	117 GOODE STREET;THIBODAUX;	LA	70301		16	

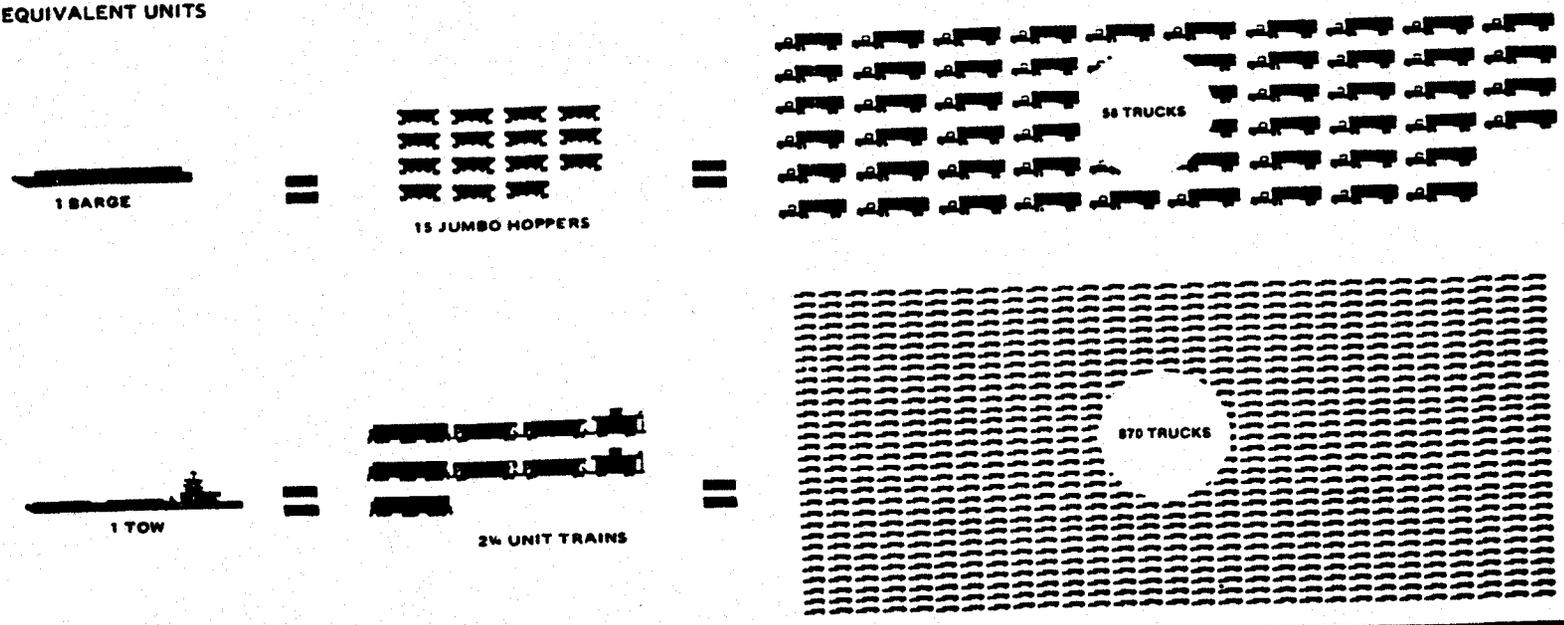
Operator Name	Address	State	Area code	Tel-number	Number of flat/deck barges	Number of towboats
MARINE OPERATORS, INC.	P. O. BOX 51694;LAFAYETTE;	LA	70505	318 232-9248	16	
CANDIES, OTTO, INC.	ATTN: GERRY HERVIEU;P. O. BOX 25;DES ALLEMANS	LA	70030	504 469-7700	15	12

COMPARATIVE MODAL CAPACITY

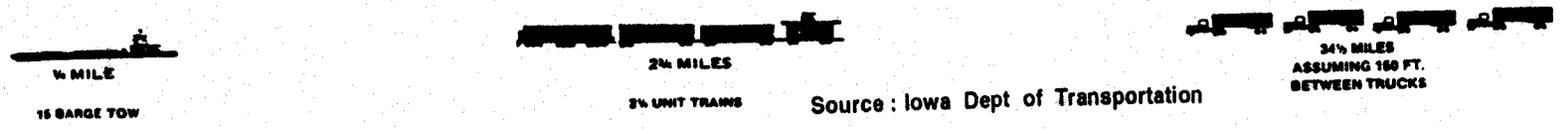
CARGO CAPACITY



EQUIVALENT UNITS



EQUIVALENT LENGTHS



Source: Iowa Dept of Transportation

APPENDIX D

Military Use of Inland Waterway System

APPENDIX E

**INFORMATION AND ASSISTANCE CONTACTS
For
Military Use of Inland Waterways**

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Nassif Building
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**MILITARY USE
OF
THE INLAND WATERWAY SYSTEM**

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John A. Sparlin
Chief, Economics Section, Planning Div.

~~June, 1994~~

U.S. Army District, Tulsa

U.S. ARMY CORPS OF ENGINEERS
Institute for Water Resources
Navigation Division
Fort Belvoir, Virginia 22345-3868

June 1994

IWR Report 94-R-

~~21NOV94~~

FOREWORD

The U.S. Army Corps of Engineers has developed and operates over 10,000 miles of inland waterways in the U.S. Private carriers move over 600 million tons of traffic on the system annually, and provide low cost transportation to shippers who want to move big loads long distances. Savings to shippers average over \$8 per ton over the cost of shipping by alternative modes.

The Armed forces utilize waterway transportation extensively to transport petroleum, oils and lubricants (POL). Recently, the logistic, security and cost advantages of waterway transportation of military units equipped with heavy oversized track or wheeled vehicles has been rediscovered. Routing on waterways can often achieve improved dependability in transit time, lower security risk, enhance training opportunities and significant savings in both transit and up/down loading costs.

The purpose of this report is to help put the advantages and problems of waterway transportation of military equipment, including containerized impediments, in perspective and aid private industry, towing companies, port and terminal operators, and military users to effectively utilize this large national transportation asset.

Mr. John Sparlin, Planning Division, Tulsa District Corps of Engineers (918 669 7546) prepared this report while on a developmental assignment in the Navigation Division, U.S. Army Corps of Engineers Institute for Water Resources. He is the most informed individual in the Corps with respect to issues and opportunities for reducing the costs and achieving high performance results for transporting military unit equipment and impedimenta.

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✓

I. INTRODUCTION:

Purpose: This report has been prepared to assist Installation Transportation Offices (ITO), Mobilization and transportation planners, logisticians, and private industry to facilitate the use of the Inland Waterway System (IWS) of the United States. This report focuses on the Active Army and Army Reserve Components. All of the Services can use this report and the omission of references to the other Services in no way implies that the information contained herein does not apply equally to all. As it happens, recent experience has been initiated by the Army.

Background: The Inland Waterway System (IWS) originated in the early 1800's when extensive construction was done to improve the waterways largely driven by pressure for westward movement of people and goods. Its main features include locks and dams, channels and ports. Appendix A shows the system configuration.

II. RECENT EXPERIENCE:

In an effort to improve transportation efficiencies, during the summer of 1986 the Oklahoma Army National Guard executed a small movement of equipment over the McClellan-Kerr Arkansas River Waterway. This move originated at the Camp Gruber training Site near Muskogee, Oklahoma and traveled about 100 river miles downstream to Fort Chaffee, Arkansas. Corps of Engineers' equipment consisting of a 600-horsepower towboat and two flat-deck work barges were used as the transport vehicles. Equipment manifest included one Armored Vehicle Launched Bridge (AVLB), two M1109 Armored Personnel Carriers, and two Combat Engineer Vehicles.

Other moves include: The first Bn of the 142 Field Artillery, Arkansas Army National Guard, moved round-trip from Ft. Chaffee, AR to Camp Grayling, Michigan in 1987 a distance of 1800 miles one-way. The 189 Field Artillery, Oklahoma Army National Guard took a batallion round-trip to Camp McCoy, Wisconsin covering a one-way distance of 1200 miles. The 20th Engineer Bn moved about 112 pieces of heavy Engineer equipment from Ft. Campbell, KY onboard an ocean going barge to Belize in Central America. Perhaps the most significant user since 1987 is the 101st Airborne (AASLT). They have moved entire brigades on the Inland System several times. Some 18 various moves by differing units have occurred since the Oklahoma move in 1986.

The largest move to date has been executed by the 101st. In that move, the outfit deployed a brigade task force from Old Lock C on the Cumberland River, about 10 miles from Ft. Campbell, to the Port of Alexandria, LA on the Red River for an exercise at Ft. Polk. They transported 957 pieces of equipment, including 98 containers on board 48 deck barges. All of the equipment was loaded in 28.5 hours. They departed the load-site on 9 May and arrived at their destination on 13 May.

III. PHYSICAL SYSTEM:

Channels and Locks: The system channels are generally north-south oriented with the main-stem Mississippi as the major trunk. There are 27 waterways and they have been aggregated into nine major segments: Ohio River System; Lower Mississippi; Middle Mississippi; Upper Mississippi; Gulf Intracoastal Waterway (GIWW); Atlantic Intracoastal Waterway (AIWW); Mobile & tributaries; Columbia-Snake; and Illinois Waterway. Channel depths are 9 to 14 feet. The nine segments have a total length of about 11,000 miles.

There are 168 commercially active locks with 211 chambers in the nine segments. Twenty-five chambers are 1,000 to 1,200 feet long (12%). There are 114 chambers 600-999 feet long (54%). There are 72 chambers less than 600 feet long (34%).

Ports, Terminals and Docks: Maritime Administration studies have identified over 175 ports with over 1,500 separate terminals. In addition to these the U.S. Corps of Engineers and the U.S. Coast Guard maintain some dock facilities and marine terminals. Many facilities are private but there are docks and terminals operated by port authorities (quasi-public entities). Indiana, Georgia and Alabama operate state-owned docks. Some twelve strategic ports have been identified in the U.S. For the military, Beaumont, Texas on the Gulf coast is an important port of embarkation. Most of these are the larger east/west coast ports.

Towboats & Barges: There are over 40,000 tugs, towboats and barges that operate on the system. Towboat horsepower ranges from small harbor craft in the 200-600 horsepower range to big line boats in the 4,000 to 9,000 horsepower range. The dry-cargo barge fleet is composed of hopper, covered hopper, and deck or flat barges. There are also tanker barges for liquids. This equipment is scattered throughout the system and moves around as the demands of business dictate.

IV. THE ARMY STRATEGIC MOBILITY PROGRAM:

The Army's Strategic Mobility Program (ASMP) is the Army's plan to implement the recommendations of the Mobility Requirements Study which was done in 1992.

While the overall study is lengthy and not relevant in total for this Guide, a summary of the major elements is relevant and is as follows:

- Build or convert up to 20 large, medium speed, roll-on/roll-off ships for both surge and prepositioning.
- Deploy an afloat package of Army combat, support, and port-opening equipment by 1997.
- Expand and increase readiness of the Ready Reserve Force from 17 to 36 Round-out units by FY96.
- Continue the C-17 (large transport airplane) program.
- Improve specific components of the transportation system of the United States.
- Purchase approximately 12,000 containers during the FY93-99 timeframe
- Acquire and preposition over 1,000 railcars between FY93-99. Cars to be positioned at key installations and Army Material Command (AMC) Munitions Depots for basic load and sustainment requirements.

ASMP Designated Installations: The following installations have been designated at the present time as key installations and are central to the logistic and transportation planning of the Army at this time:

- Fort Hood, Texas
- Fort Stewart, Georgia
- Fort Benning, Georgia
- Fort Bliss, Texas

- Fort Drum, New York
- Fort Bragg, North Carolina

The installations that have direct access to the IWS are:

Fort Benning, Georgia, near the head of navigation on the Apalachicola, Chattahoochee, Flint (ACF) rivers. The ACF is 297 miles in length and has three locks. The lock size is 82' x 450' and the total lift is 146 feet. These locks were built between 1954 and 1963. The mouth of this waterway intersects with the Gulf Intracoastal Waterway (GIWW) between Carrabelle and Port St. Joe, Florida. From that point one could travel by water to any destination among the various States served by the IWS or to any Gulf Coast POE.

Fort Campbell, Kentucky, adjacent to the Cumberland River. This is the home of the 101st Airborne (AASLT). This outfit has been a user and a proponent of the IWS since their first move in 1987. They load out from an old lock wall known as "Old Lock C" at river mile on the Cumberland. Downstream they travel to the Ohio River and then a short distance to the Mississippi River. From that point they can travel anywhere on the IWS or any Gulf Coast POE. Indeed their use has been extensive.

Fort Knox, Kentucky, near Louisville and with direct access to the Ohio River. From that point, a unit could travel anywhere by water on the IWS including any POE on the Gulf coast.

Fort Bragg, North Carolina, lies near the navigable Cape Fear River which flows downstream directly to the Atlantic Intracoastal Waterway.

Fort Rucker, Alabama, close to the ACF waterway. This waterway also serves Fort Benning, discussed above.

Fort Stewart, Georgia, is very close to the navigable Savannah River the mouth of which intersects with the Atlantic Intracoastal Waterway (AIWW).

Fort Gordon, Georgia, near Augusta and the head of navigation on the Savanna River.

OTHER MAJOR INSTALLATIONS: A number of other major Army installations have varying degrees of access to the IWS but are not presently specifically named as key installations in the ASMP. That certainly does not mean that they are not candidates for use of the IWS. Appendix B shows these and other installations. Those installations are:

Fort Lewis, Washington, is adjacent to Puget Sound, and has direct access to the Pacific Ocean.

Fort McClellan, Alabama, is within about 100 miles of the Black Warrior-Tombigbee Waterway (BWT) near Birmingham. Downstream on this navigable channel, the BWT intersects the GIWW and has access to the entire IWS and any Gulf POE.

Fort Benjamin Harrison, Indiana, while not "close" it is certainly within range of the Ohio River immediately to the south and could use the IWS in an intermodal context in truck-barge combination for containers or specialized equipment movements. A truck-barge combination might be just as efficient and cost/time effective as a line haul to a Gulf POE.

Fort McPherson, Georgia, lies near Atlanta with the head of navigation on the ACF Waterway directly to the south. Again, a truck-barge or intermodal haul to a Gulf POE may be just as efficient as a line haul on a single mode.

Fort Drum, New York, lies near Lake Ontario between the St Lawrence Seaway and the New York State Barge Canal.

Forts Hood and Bliss, Texas, are both key installations but are not in close proximity to the IWS.

IV. THE ACTIVE ARMY:

The United States Army has changed, and is changing with the end of the cold war. Down-sizing continues as the Army evolves into a more efficient institution.

The Army position, taken from a recent briefing package supplied by the Strategic Mobility Division, Office of the Deputy Chief of Staff for Logistics, (DCSLOG) U.S. Army, The Pentagon, states:

"The Army must provide a Corps of five Divisions that is tailorable, sustainable, and with Airborne, vertical insertion capability. The lead Brigade must be on the ground by C+4, the lead Division by C+12.

Two heavy divisions (sealifted) arrive from CONUS by C+30. (Armored Mechanized, Air Assault, (mix per CINC)). The full Corps (five divs and a COSCOM) closes by C=75. A fully supported heavy combat brigade, with sufficient supplies to sustain the Corps until lines of communication are established, must be prepositioned afloat."

VI. RESERVE COMPONENT FORCES:

The total force changes of the past five years have made a very different picture of the Army and Air National Guard of today. Force structure changes, mission realignments, and lower end strength have had a very strong impact not only on the individual Guard member but also on the leadership of each State. It is important to note that in peacetime the National Guard is under the command and control of the state governors. The state Adjutant Generals lead the Guard.

Actions affecting the Army National Guard and the Army Reserve, and the leadership of these organizations, are vested in the Chief, National Guard Bureau and the Chief, Army Reserve. Though some units are maintained at higher levels of readiness than others, all are expected to meet minimum Army training and readiness standards. Contingency Force Package units and enhanced readiness brigades will be early deployers in the war planning sequence.

The National Guard reserve component forces are organized into six areas within the continental United States (CONUS). Plate 1 shows those areas. The situs of the IWS is predominately in the eastern half of the U.S. and as such areas one thru five are of primary interest to this Guide. Area Six, encompassing about the western 40 percent of the Nation does have the Columbia/Snake system which serves the States of Washington, Oregon and western Idaho. The Sacramento River serve parts of western California.

Each state within its respective areas has a complement of major commands. Some states have more commands than others. Table 1 shows the Major Commands. Within those major commands there are many component units and their place in the Contingency Force Pool (CFP) differs. Some of those units will have a high priority and will be early deployers while others will not. It is beyond the scope of this report to identify each component unit; indeed some of that subject matter is classified.

Users of this report within the Active Army and National Guard will of course know where they stand in the CFP. Generally, Field Artillery, Engineer heavy units, Multiple Launch Rocket System Units (MLRS), Armored and Cavalry units, and even straight-leg infantry units will have a lot of equipment and containers that can be transported over the IWS.

TABLE 1

PROBABLE CONTINGENCY FORCE POOL (CFP) UNITS
Army National Guard Major Commands

AREA I

43rd Inf Bde	CN	
26th Inf Bde	MA	
253rd Cmbt CommGp	MA	
240th Engr Gp	ME	*
197th FA Bde	NH	
50th Armored Bde	NJ	
42nd Inf Div	NJ	
42nd Inf Div Mech	NY	
27th Inf Bde	NY	
103rd FA Bde	RI	
86th Armored Bde	VE	

AREA II

123rd Armored Bde	KY	
138th FA Bde	KY	has a MLRS Bn
149th Inf Bde	KY	
35th Inf Div	KY	
29th Inf Div	MD	
30th Eng Bde	NC	
30th Inf Bde	NC	
37th Armored Bde	OH	
16th Eng Bde	OH	
28th Inf Div (hvy)	PN	
111th Eng Group	WV	
29th Inf Div (lt)	VA	
29th Div Arty	VA	
176th Engr Group	VA	

AREA III

31st Armored Bde	AL	
53rd Inf Bde	FL	
164th AirDef Arty	FL	
48th Inf Bde	GA	
265th Eng Group	GA	*
278th CCav Reg	TN	
196th FA Bde	TN	
194th Eng Bde	TN	
218th Heavy Bde	SC	
151st FA Bde	SC	
263rd Air Def Bde	SC	

AREA IV

142nd FA Bde	AR	
35th Inf Div	KN	
256th Inf Bde (mec)	LA	
225th Eng Group	LA	
155th Armored Bde	MS	
631st FA Bde	MS	
184th Trans Bde	MS	
168th Engr Group	MS	*
35th Eng Bde	MO	
35th Eng Bde	MO	
135th FA Bde	MO	
45th Inf Bde	OK	* (120th Engrs)
45th FA Bde	OK	MLRS Bns (158 & 171 FA)
49th Armored Div	TX	

AREA V

33rd Inf Bde	IL	
66th Bde	IL	
38th Inf Div	IN	
34th Inf Div	MN	
46th Inf Bde	MI	MLRS Bn
164th Eng Group	ND	
35th Inf Div Mec	NB	
147th FA Bde	SD	
109th Eng Group	SD	
32nd Inf Bde mec	WI	
57th FA Bde	WI	
264th Eng Group	WI	

AREA VI	40th Inf Div Mech	CA
	169th FA Bde	CO
	153rd FA Bde	AZ
	116 Cav	ID
	163rd Armored Bde	MN
	41st Inf	Or
	I Corps Arty	UT
	81st Inf	WA
	115th FA Bde	WY
	49th FA	WY

* Engr Heavy CFP 1 Unit

Source: 10th Yearbook Edition, National Guard, Jan, 1994

Note: Down-sizing, realignment and the operation of BRAC may bring about significant changes in this list.

VII. HOW MOVES OCCUR:

Most moves are planned well in advance of actual execution. This is true of both active and reserve units except of course in times of war or emergency when lead time is short. The primary responsibility for moving the military around is the United States Transportation Command (TRANSCOM) and a subordinate Agency, the Military Traffic Management Command (MTMC). The former is located at Scott AFB in Illinois and the latter in Falls Church, Virginia. MTMC has a western area office at Oakland, California and an eastern area office at Bayonne, New Jersey.

Unit moves are requested by the Installation or Unit Transportation Office or officer to the MTMC. This is often done on a standard form or on an Automated Unit Equipment list.

The MTMC prepares the documents, solicits for transportation vendors, makes the award and pays the vendor. The Unit decides when it wants to go and where it wants to go. The MTMC is a service agency. The MTMC may hire trucks, railroads or towing companies. Theoretically any combination could be used in a move. Private sector vendors bid on moves and the bidder is chosen based on the lowest bid.

Recently, MTMC has emphasized total quality and "best value" as a selection criteria. Implied in that are factors which may not be explicit in solicitations for bids such as avoidance of loss during transit, dependability, safety, environmental & energy considerations and other qualitative factors which contribute to good results.

Lowest cost criteria has always been accompanied by other requirements but those criteria have not always been clearly understood by the bidders.

Some transporters, particularly the railroads, file Tenders with MTMC. These Tenders quote a rate for cars and service and are maintained in MTMC files for a specific period. When a transportation request comes in, sometimes the Tender in the file is used to select the bidder. Units can request a particular mode as indeed the 101st has done more than once to move by barge on the IWS.

In order to bid on a military move a vendor must first know it is happening and have the equipment to do the job. The military does move itself around also. For example, a unit could negotiate directly with another agency and pay for the move on a Military Interagency Purchase Request (MIPR). This has in fact been done with the Corps of Engineers where Corps floating equipment has been used. This is not a common practice.

In the new, emerging Army, much equipment will be prepositioned at sea and troops flown in to the theatre of operations. Resupply, follow-on force support, depot level resupply, redeployment and demobilization are all candidates for the IWS. During peacetime, use of the IWS has been viable financially and logistically as has been demonstrated by recent experience.

VIII. BARGE LOADING OPERATIONS:

Docks, Wharves & Load Sites: Most of the military moves that have occurred since 1987 have been from unimproved sites. In these cases, the barges are pushed up against a dirt embankment in a perpendicular manner, held against the bank with the power of the towboat and the equipment driven onto the barge. Sometimes a dirt ramp is pushed up by a bulldozer.

The 101st uses an old lock wall on the Cumberland which amounts to a concrete hard stand. The 189 FA Okla Army National Guard used a roll-on/roll-off (RORO) dock at the Port of Catoosa for a move. There are an almost unlimited number of places where a loading operation could take place along the IWS. Some units have loaded at Corps of Engineer's lock and dam sites along the river e.g., Lock and Dam 7 on the Upper Miss, McAlpine Lock and Dam on the Ohio and the Corps marine facility at Rock Island, Ill.

Locating the loading site can be an easy job or a hard one depending where a move starts and where its going. People who can assist include IWS towing companies, the Corps of Engineers, and port and terminal operators. Some road-march is always required regardless of mode. That is, it is necessary to get the equipment to the railhead or dock.

Barges & Towboats: Barges are lashed together in various configurations for loading. For transit they are cabled together into a "tow" that is usually three wide and three long. Barges may not all be uniform in size. The common deck size is 35' x 195' or the so-called Jumbo, but a carrier may mix several sizes together for any given move.

Equipment should be driven onto the barge with the heaviest items equally spread port to starboard (left to right) in the rear of the barge with the weight diminishing toward the bow (front). Units usually do their own load planning. Height/weight is not a restraining factor as long as the load is balanced on the barge. In load planning a barge, the planner is concerned only with length, width and approximate balance.

On the IWS, consensus is that tying down the front row and rear row of equipment should be done to minimize the risk of forward dumping in the event of impact with an object while the tow is underway (moving). Vehicles (equipment) should be placed bumper-to-bumper in the string (bow to stern) so that the string is like an integrated monolith. Some feel that the perimeter vehicles should also be tied. All equipment is parked in gear with the hand brake set. For a blue-water move, across the Great Lakes or to Central America for example, each piece should be tied down. A qualified fuel handler should be on board as super cargo and there should be additional fire extinguishers on board.

Towboats that have been used in recent experience range from 4,200 horsepower to 600 horsepower. Generally, 2,000-2,500 horsepower will easily handle an eight-barge tow. The 101st has moved with as many as 48 deck barges in a single move. On the Mississippi, the tows are larger than eight barges and use more powerful towboats.

Vendors: There are many vendors on the IWS who have yet to bid on a military move. Many do not know where to start. They should be referred to the MTMC.

In actual practice, some vendors have predominantly floating equipment and few or no towboats while others have towboats and few barges. Some companies have both. Many so-called Mom & Pop towing companies can bid on this work but will have to lease barges for the job. They may be at a disadvantage compared to the companies who have both. Appendix C lists some of the larger towing companies on the IWS but is not a complete list. The commercial barge fleet is randomly deployed where business is available. Some deployment to accomodate the military would certainly occur if the business were there.

IX. ADVANTAGES OF BARGE TRANSPORTATION;

Users to date, that is since the "rediscovery" in 1987, report no loss of equipment from theft, vandalism or shrinkage. No personnel have been injured. However water, like the other modes, has its hazards and care and safety are essential. The following list is a consensus of the military users enumerating the advantages of using the IWS both with and in lieu of other modes of transportation:

- Up-load and down-load times are much faster, generally about half the time of rail. Bow and stern equipment (load) tie-down should be done.
- In-transit security is very high with no access to the cargo from land. Super-cargo (personnel) can be carried for on-board maintenance and security if desired.
- Fuel can be carried in the vehicles and vehicle height does not have to be reduced. e.g. antennas and windshields can be left erect.
- Military moves have priority passage on the IWS. The Corps of Engineers radio net at the locks and dams allows around-the-clock monitoring of the location and status of the move and equipment thereon.
- Total lapsed time of transit from origin to destination is equal or less than other modes.

- All sizes of equipment can be carried. Units moved include Engineer, Armor, Field Artillery, Infantry and no equipment has been too large or too heavy to move. Indeed, the 101st has moved UH-60 Blackhawk Helicopters and nearly 100 containers at one time on the IWS.
- Loading can be accomplished at unimproved sites at almost unlimited areas along the IWS. Of course commercial docks can also be used.
- Modal competition, particularly between rail and barge, is introduced and experience shows that cost to DoD falls.

X. CRITERIA FOR TRANSPORT MODE SELECTION:

The Military Traffic Command is familiar with rail, truck and air modes of transportation but has limited experience with the Inland Waterways. Appendix D shows comparative tonnage capacity by mode. MTMC's response to interest in IWS movements has been on a case-by-case basis.

Guidance from MTMC on mode selection is contained in its publication: LOGISTICS HANDBOOK FOR STRATEGIC MOBILITY PLANNING, Phamplet 700-2, (MTMC TEA). A section on Inland Waterways has been included. The general guidance for CONUS moves in that phamplet is:

- Mode selection should consider economic requirements, availability of assets, hostile threat assessment, and special requirements.
- Transportation options include motor, rail and inland waterways. MTMC has in the recent past identified inland waterways as an option only for equipment that exceeded rail carrier capabilities. That view has been brought into serious question by recent military moves.
- Army units will use commercial transportation during mobilization.
- Sufficient commercial resources must be available.
- MTMC must validate the capability and the major command (MACOM) must approve the move.

- Organic road-marches are authorized when units are located within a one day march to their destination.
- Organic road-marches are also authorized when commercial transportation is not adequate.

Motor Transport: Motor transport is often required for at least some transport of cargo. Size and weight restrictions are major impediments to highway use. Urban congestion is often a major concern and may be a severe restriction in some areas. The Interstate System has legal limits of 80,000 pounds for gross vehicle weight and 8 1/2 feet width and 13 1/2 feet total height.

Compared to these limits more than 25 Army equipment-transporter combinations exceed the legal weight and size limits of the Interstate System. Secondary roads are even more restrictive.

For example, a single Abrams tank transported on the M746-M747 heavy equipment transporter (HET) has a gross vehicle weight of about 200,000 pounds.

Civil highway authorities are reluctant to waive weight requirements and often height is a physical restriction. The shortest over-the-road route may not be available for one or more of the above reasons.

Railroads: At present, rail equipment is the primary means of transport for CONUS based forces. The rail system is nationwide in situs and there are a variety of flat and other car types. Some flatcars are prepositioned at installations.

Railroads can transport most heavy and some oversize equipment, but there are some restrictions. The railroads have a history of working closely with the MTMC and military units.

Barges: Until very recently the military did not consider the inland waterways as a transport mode option for unit movements. (Petroleum, oil and lubes do move on the IWS) Since 1986 it has been demonstrated that the inland waterways are a viable transport mode for unit movements and that significant cost savings can be achieved with no downside to timelines.

The inland waterways are an effective transport mode and increased use is likely given the demonstrated success of many units since 1986, particularly the large moves of the 101st Airborne (AASLT).

The increased emphasis on intermodal transport, generated by both economic reality and policy may well enhance the use of the IWS for military equipment and container movements in direct competition with railroads.

XI. CONCLUSION:

Since 1986, military unit movements have proved that the inland waterway system is a viable mode of transportation. Impediments to continued and expanded use of the IWS include lack of information among the potential military users, the towing industry and port and terminal operators along the system. Most have no prior experience with the military use of the system. In simplest terms, the unknown and limited experience best describe the impediment. In a briefing with MG Fred Elam, the ADCSLOG at the Pentagon in 1993, MG Elam described the system as "a forgotten resource".

Consensus of those military users who have "rediscovered" the system report they believe the system is applicable to the following activities:

- Use of the IWS by military units within CONUS for transport to and from training sites, both for Active Army and Reserve Component Forces.
- Use of the IWS for redeployment to home stations within CONUS from ocean ports.
- Use of the IWS for demobilization of forces returning to CONUS from world-wide locations.
- Use of the IWS to transport follow-on force impedimenta to any Gulf coast POE.
- Use of the IWS to transport resupply impedimenta to any Gulf coast POE for shipment to deployed forces worldwide.
- Use of the IWS to transport HAZMAT, ordnance or related items within both CONUS and to POE. (More study needs to be directed toward this particular subject)

The waterways should be viewed as a direct alternative to rail where origins and destinations are accessible within CONUS and particularly to any Gulf Coast POE. The IWS should also be viewed as a viable option for truck/barge combination intermodal movement of containers. Intermodal solicitations from MTMC will lower transportation costs for DoD. Use of the IWS produces environmental benefits and energy savings as well as dollar savings in transportation costs when compared to other modes. Appendix E provides some contacts for additional information.



IMAGEWORLD

*Military Use of the Inland
Waterway System*

June 1994



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