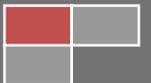


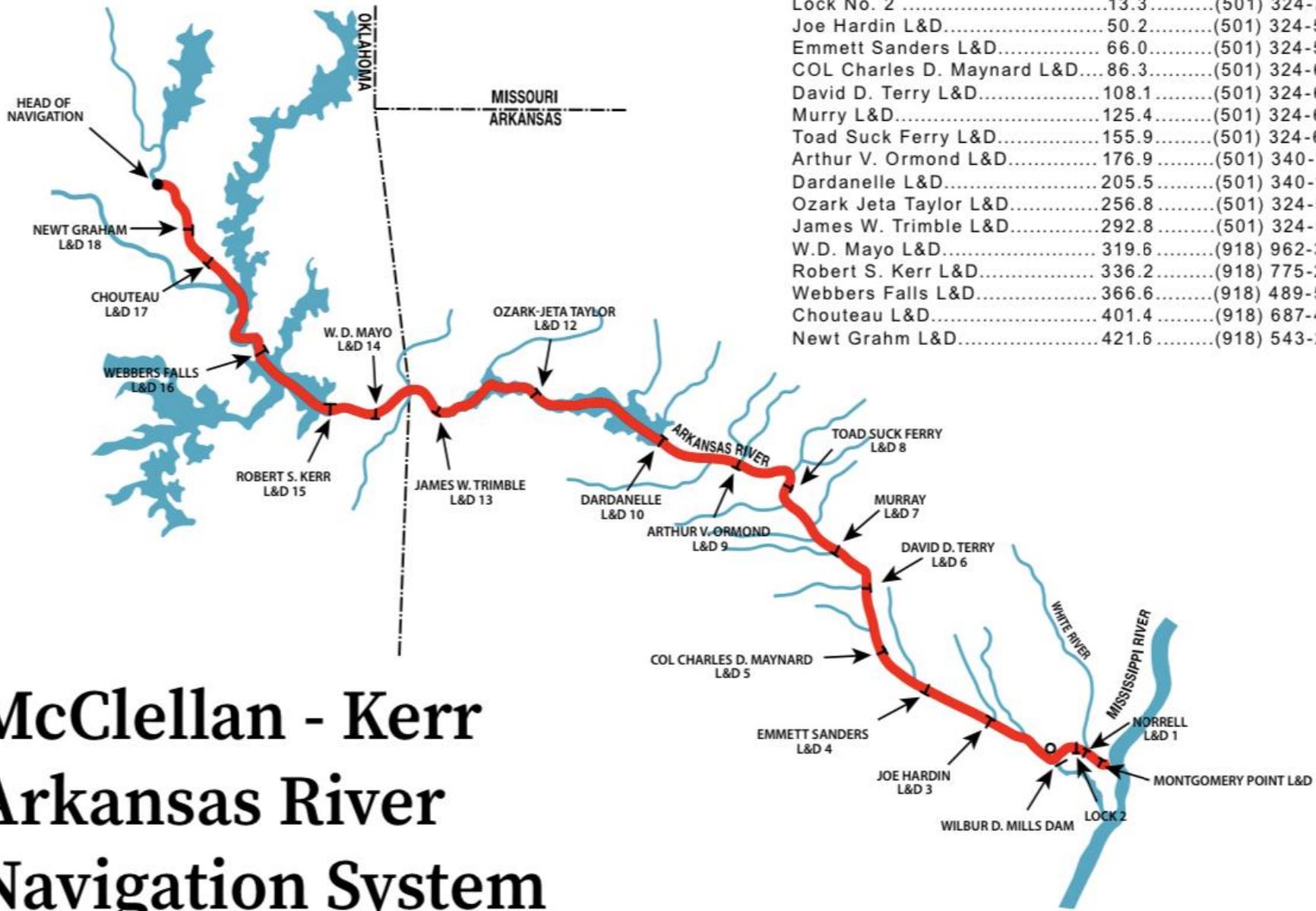
2023

# MKARNS Waterway Action Plan



## Mileposts & Phone Numbers of Locks & Dams

Lock	Navigation Mile	Phone #s
Montgomery Point L&D.....	0.5.....	(501) 324-7340
Norrell L&D.....	10.3.....	(501) 324-7341
Lock No. 2.....	13.3.....	(501) 324-7349
Joe Hardin L&D.....	50.2.....	(501) 324-5888
Emmett Sanders L&D.....	66.0.....	(501) 324-5889
COL Charles D. Maynard L&D....	86.3.....	(501) 324-6997
David D. Terry L&D.....	108.1.....	(501) 324-6229
Murry L&D.....	125.4.....	(501) 324-6986
Toad Suck Ferry L&D.....	155.9.....	(501) 324-6984
Arthur V. Ormond L&D.....	176.9.....	(501) 340-1224
Dardanelle L&D.....	205.5.....	(501) 340-1229
Ozark Jeta Taylor L&D.....	256.8.....	(501) 324-5714
James W. Trimble L&D.....	292.8.....	(501) 324-5713
W.D. Mayo L&D.....	319.6.....	(918) 962-3481
Robert S. Kerr L&D.....	336.2.....	(918) 775-2091
Webbers Falls L&D.....	366.6.....	(918) 489-5987
Chouteau L&D.....	401.4.....	(918) 687-4501
Newt Graham L&D.....	421.6.....	(918) 543-2216



# McClellan - Kerr Arkansas River Navigation System

**BRIDGE DATA**

<u>Bridge Name</u>	<u>Nav. Mile</u>	<u>Vertical Clearance At</u>		<u>Horizontal Clearance</u>	<u>Bridge Name</u>	<u>Nav. Mile</u>	<u>Vertical Clearance At</u>		<u>Horizontal Clearance</u>
		<u>Nav. Pool</u>	<u>2% Flow</u>				<u>Nav. Pool</u>	<u>2% Flow</u>	
<u>Benzal R.R.</u>	<u>7.6</u>	<u>-</u>	<u>52 ft*</u>	<u>300 ft</u>	<u>Highway 59/Lock &amp; Dam Hwy</u>	<u>292.8</u>	<u>53.9 ft</u>	<u>52 ft</u>	<u>110 ft**</u>
<u>Tichnor - Nady</u>	<u>13.4</u>	<u>56 ft</u>	<u>52 ft*</u>	<u>110 ft**</u>	<u>I-540</u>	<u>299.6</u>	<u>56.2 ft</u>	<u>52 ft</u>	<u>300 ft</u>
<u>Pendleton</u>	<u>22.6</u>	<u>57 ft</u>	<u>52 ft*</u>	<u>322 ft</u>	<u>Highway 64 and 71</u>	<u>300.4</u>	<u>57.6 ft</u>	<u>52 ft</u>	<u>300 ft</u>
<u>Emmet Sanders Lock and Dam Highway Bridge</u>	<u>66.0</u>	<u>65.25 ft</u>	<u>65.25 ft</u>	<u>110 ft**</u>	<u>Van Buren R.R.</u>	<u>300.8</u>	<u>4701 ft*</u>	<u>52 ft*</u>	<u>312 ft</u>
<u>Rob Roy R.R.</u>	<u>67.4</u>	<u>52.4 ft*</u>	<u>52 ft*</u>	<u>300 ft</u>	<u>Highway 64/Garrison St.</u>	<u>308.4</u>	<u>64.5 ft</u>	<u>52.5 ft</u>	<u>300 ft</u>
<u>Highway 79</u>	<u>74.8</u>	<u>60.5 ft</u>	<u>52.1 ft</u>	<u>311 ft</u>	<u>Kansas City Southern R.R.</u>	<u>324.4</u>	<u>62.3 ft</u>	<u>52.2 ft</u>	<u>300 ft</u>
<u>Pipeline Bridge</u>	<u>92.4</u>	<u>58 ft</u>	<u>-</u>	<u>1700 ft</u>	<u>Larry Dickerson Memorial</u>	<u>335.7</u>	<u>76.9 ft</u>	<u>52 ft</u>	<u>342 ft</u>
<u>I-440</u>	<u>112.9</u>	<u>57.3 ft</u>	<u>52 ft</u>	<u>500 ft</u>	<u>Highway 9</u>	<u>SBC 11</u>	<u>33.1 ft</u>	<u>30.5 ft</u>	<u>237 ft</u>
<u>Clinton Presidential Park</u>	<u>118.2</u>	<u>61.5 ft</u>	<u>52 ft*</u>	<u>318.5 ft</u>	<u>Haskell County Road 11a</u>	<u>SBC 7.5</u>	<u>32.9 ft</u>	<u>30 ft</u>	<u>236.5 ft</u>
<u>I-30</u>	<u>118.5</u>	<u>65.6 ft &amp; 66.5 ft</u>	<u>56 ft</u>	<u>174.5 ft &amp; 169.5 ft</u>	<u>I-40</u>	<u>360.3</u>	<u>63.5 ft</u>	<u>50.9 ft</u>	<u>296 ft</u>
<u>Juntion R.R.</u>	<u>118.7</u>	<u>65.3 ft*</u>	<u>52 ft*</u>	<u>332.0 ft</u>	<u>Highway 64</u>	<u>363.1</u>	<u>64.5 ft</u>	<u>52 ft</u>	<u>307 ft</u>
<u>Main Street</u>	<u>118.8</u>	<u>62 ft</u>	<u>52 ft</u>	<u>303.5 ft</u>	<u>Highway 62</u>	<u>392.5</u>	<u>67 ft</u>	<u>52 ft</u>	<u>300 ft</u>
<u>Broadway</u>	<u>119.1</u>	<u>62.3 ft</u>	<u>52 ft</u>	<u>331.3 ft</u>	<u>Highway 16</u>	<u>398</u>	<u>69.5 ft</u>	<u>52 ft</u>	<u>301 ft</u>
<u>Baring Cross R.R.</u>	<u>119.6</u>	<u>62.7 ft*</u>	<u>52 ft*</u>	<u>311.6 ft</u>	<u>M.K.T. R.R. (Cherokee Sub Mile 496.0)</u>	<u>399.2</u>	<u>70.1 ft</u>	<u>52.6 ft</u>	<u>300 ft</u>
<u>Pulaski County Pedestrian &amp; Bicycle Bridge</u>	<u>125.4</u>	<u>66 ft</u>	<u>66 ft</u>	<u>110.2 ft**</u>	<u>Highway 69</u>	<u>404</u>	<u>53 ft</u>	<u>52 ft</u>	<u>300 ft</u>
<u>I-430</u>	<u>126.6</u>	<u>52.4 ft*</u>	<u>52 ft</u>	<u>377.7 ft</u>	<u>Highway 51</u>	<u>412.2</u>	<u>62.0 ft</u>	<u>52.5 ft</u>	<u>192.8 ft</u>
<u>Highway 60/Toad Suck Ferry</u>	<u>155.9</u>	<u>55 ft</u>	<u>52 ft</u>	<u>110 ft**</u>	<u>Highway 33</u>	<u>431.4</u>	<u>63.5 ft</u>	<u>52.5 ft</u>	<u>314 ft</u>
<u>Highway 9</u>	<u>173.0</u>	<u>65 ft</u>	<u>52 ft</u>	<u>300 ft</u>	<u>I-44</u>	<u>443.1</u>	<u>71.5 ft</u>	<u>53.3 ft</u>	<u>188.5 ft</u>
<u>Highway 79</u>	<u>203.5</u>	<u>70.8 ft</u>	<u>52 ft</u>	<u>300 ft</u>	<u>Highway 66</u>	<u>444.2</u>	<u>72 ft</u>	<u>52 ft</u>	<u>313 ft</u>
<u>Highway 109/Clarksville Hwy</u>	<u>234.8</u>	<u>63.3 ft</u>	<u>52 ft</u>	<u>400 ft</u>	<u>Burlington Northern R.R.</u>	<u>444.3</u>	<u>72.0 ft</u>	<u>52.3 ft</u>	<u>300 ft</u>
<u>Highway 23</u>	<u>258.2</u>	<u>54.2 ft</u>	<u>52 ft</u>	<u>353 ft</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>

## LOCK AND DAM INFORMATION

<b>LOCK NAME</b>	<b>RIVER MILE</b>	<b>NORMAL POOL HEADWATER (H/W)</b>	<b>LOCK CLOSURE HEADWATER (H/W)</b>	<b>LOCK DIMENSIONS (WIDTH X LENGTH)</b>
Lock 1 – Norrell	10.8	142.0'	---	110' X 600'
Lock 2	13.3	162.0'	TW > 160.0'	110' X 600'
Lock 3 – Joe Hardin	50.2	182.0'	> 189.2'	110' X 600'
Lock 4 – Emmett Sanders	66.0	196.0'	> 200.2'	110' X 600'
Lock 5 – COL Charles D. Maynard	86.3	213.0'	> 220.2'	110' X 600'
Lock 6 – David D. Terry	108.1	231.0'	> 238.2'	110' X 600'
Lock 7 – Murry	125.4	249.0'	> 253.2'	110' X 600'
Lock 8 – Toad Suck Ferry	155.9	265.0'	> 274.2'	110' X 600'
Lock 9 – Arthur V. Ormond	176.9	284.0' – 287.0'	> 288.2'	110' X 600'
Lock 10 – Dardanelle	205.5	338.0'	> 340.8'	110' X 600'
Lock 12 – Ozark-Jeta Taylor	256.8	372.0'	> 375.9'	110' X 600'
Lock 13 – James W. Tremble	292.8	392.0'	> 396.2'	110' X 600'
Lock 14 – W.D. Mayo	319.6	412.0'	> 419.0'	110' X 600'
Lock 15 – Robert S. Kerr	336.2	460.0'	TW > 440.0'	110' X 600'
Lock 16 – Webbers Falls	366.6	490.0'	TW > 473.0'	110' X 600'
Lock 17 – Chouteau	401.4	511.0'	> 516.0'	110' X 600'
Lock 18 – Newt Graham	421.6	532.0'	> 537.0'	110' X 600'

All elevations are measured in feet NGVD.  
Headwater (HW) is the elevation upstream  
of the lock.  
Tailwater (TW) is the elevation downstream  
of the lock.

## Executive Summary

The goal of the McClellan-Kerr Arkansas River Navigation System (MKARNS) Waterway Action Plan is to ensure safety of life and navigation, protection of infrastructure and property, and to prevent marine casualties.

The Waterways Action Plan (WAP) is a living document that should be frequently reviewed and updated. This plan establishes a framework for all parties to use when taking proactive or reactive steps to manage and respond to high flow and low flow conditions. The overall goal of this plan is to ensure safety of life and navigation, protection of infrastructure and property, and to prevent marine casualties.

This WAP provides general information and reference gauges to be used as a guideline for high and low water events on the MKARNS between navigation miles marker 0 to 445. It is the responsibility of the US Coast Guard (USCG), US Army Corps of Engineers (USACE), and MKARNS Industry representatives to meet and discuss river conditions and possible restrictions on the MKARNS, as well as annually review the actions specified in the plan. The MKARNS is broken down into 18 pools. Each pool is delineated by navigation mile and is characterized by river flow and stage, with three phases (e.g., **Watch, Action, and Recovery Phases**) described in the plan. A combination of reference gauges, historical data and known impact areas were used to derive these pools.

Conference calls between USCG, USACE, the Arkansas Oklahoma Port Operators Association (AOPOA-ARERT Committee), and MKARNS Industry stakeholders have proven critical throughout the years of response to river emergencies, and they remain useful tools to successfully manage river emergencies.

USACE, USCG, and industry leaders worked jointly to provide the following information contained in the 2023 MKARNS Waterways Action Plan.

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## **McClellan-Kerr Arkansas River Navigation System (MKARNS) Waterways Action Plan (WAP)**

### COMMUNICATIONS / CONFERENCE CALLS

Efficient and effective communication can help prevent or minimize damage and/or losses that can occur due to differing river conditions. The purpose of this section of the MKARNS WAP is to provide a process for all parties to communicate during high flow and low flow conditions.

Members will include representatives from: the National Weather Service (NWS), the US Coast Guard (USCG), the U.S. Army Corps of Engineers (USACE), the Arkansas Oklahoma Port Operators Association (AOPOA – ARERT Committee), and Industry. All individuals within the Communication Matrix identified in bold type shall participate in the conference call or provide a replacement that has the decision-making authority to act on their behalf. Initial notification for a conference call to interested parties will be using AOPOA’s email distribution list. Unless otherwise stated, the Conference Phone Number will be provided by the AOPOA Chairman or Co-Chairman.

#### Initial Incident Notification Teleconference:

The format of the Waterways Action Plan/ AOPOA is as follows, coordinated by the AOPOA Chairman: Opening:

AOPOA Chairman/Call to Order

By Agency:

1. NWS
  - a. Current Rainfall predictions
  - b. Short- and Long-term forecast
2. USACE (to be led by District Representative from Little Rock District and Tulsa District)
  - a. Provide General Overview of River Conditions
  - b. Current Situation
  - c. River Forecasts
3. USCG (Sector Lower Mississippi River)
  - a. Assessment
  - b. Actions Taken ((e.g., Broadcast Notice to Mariners (BNMs)) including status of Tenders /Areas worked)
  - c. Anticipated Future Actions Based on River Forecasts
4. Industry (by lead Committee Representative)
  - a. Assessment
  - b. Actions Taken
  - c. Future Actions Based on River Forecasts
5. General Discussion/Future and Recommendations for Implementation

Closing: Next Meeting – discussion of the focus and participants in future meetings (based on projected river conditions)

# 1. INTRODUCTION

This plan provides guidance for marine operations and transportation emergencies on the McClellan-Kerr Arkansas River Navigation System (MKARNS). Some river emergencies significantly disrupt navigation and may be caused by a natural or man-made disaster, or a combination of both. The goal of the plan is to serve as a guide for officials of the U.S. Coast Guard (USCG), U.S. Army Corps of Engineers (USACE), local Emergency Management Agencies (EMA) and the navigation industry to facilitate the safe and orderly movement of barge traffic during navigational crises. Also, the resources of this plan can be utilized to minimize the impacts to waterway users from certain waterway maintenance functions such as lock closures and bridge construction.

Arkansas Oklahoma Port Operators Association (AOPOA) users must realize that each crisis has its own unique set of issues, factors and controlling elements that require constant evaluation and adjustment. Critical to this effort is early and open communication with all parties to assure that response actions reflect fair and equal consideration of the interests of all parties, including the public. The need for effective communications cannot be overemphasized. Timely exchange of information is important, but only if the involved parties have an integrated system to assure the most current data is disseminated.

## 2. HYDROLOGY AND METEOROLOGY

### 2.1 Purpose

The purpose of this chapter is to provide those persons charged with mitigating the effects on navigation of abnormal water levels on the MKARNS with basic information on the hydrological and meteorological factors that affect the MKARNS system and to identify how these factors affect river levels and navigation safety. This chapter also outlines the general philosophy for dealing with navigation safety issues and discusses the tools available to conduct waterway management activities.

#### 2.1.1 Hydrological and Meteorological Factors Affecting Waterway Management

The USACE manages the flow of the MKARNS for navigation, power generation, water quality, and water supply. There are frequently times when special water operations are needed to prevent or minimize flooding. In times of drought, special water operations emphasize conservation to maximize the value of the water to all users.

The MKARNS system managed by the USACE consists of 18 navigation locks and dams and 4 federal hydropower facilities. The MKARNS is also connected to the Mississippi River just below Montgomery Point Lock and Dam (NM 0.5).

Inflow to the reservoirs is dependent on many factors including water flow, soil moisture, snow cover, precipitation, temperature, and weather patterns. The USACE constantly monitors these factors and forecasts river conditions to ensure adequate preparation for emergency situations.

Numerous variables affect how much water is in the system at any given time. Listed below are some of the key variables the USACE must consider:

1. **Base flow:** The amount of flow (measured in CFS) along a section of river is usually measured at a dam. The USACE has established a historical average flow rate for each section of the river prior to impoundment of the reservoir. Flow rates are now dependent on generation patterns or minimum flow requirements for the applicable time of year.
2. **Soil moisture:** The amount of moisture concentrated in the soil. High soil moisture content means a large percentage of new precipitation will not be absorbed into the soil. This will result in increased runoff and a corresponding increase in water levels. Soil moisture averages and current levels are available from the U.S. Geological Survey (USGS) and State water/soil conservation agencies.
3. **Precipitation:** The amount of rain/sleet, etc. This becomes runoff and impacts water levels in the river systems. The amount and duration of precipitation are equally important factors. Precipitation averages and totals can be obtained from the USGS, the National Oceanic and Atmospheric Administration (NOAA), the National Weather Service (NWS) and State agencies.

## **3. Waterway Management**

### **3.1 Goal**

The goal of this plan is to facilitate safe navigation during a period of less than optimum conditions. Timely, well-designed interventions by USCG and USACE will bring stability and order to the confusion surrounding a flood, drought, or other incidents such as spills, emergency lock closures and failure of other navigation related structures and will limit adverse economic impact on local and regional economies. The management of marine traffic during emergencies requires a clear set of goals and a focused plan of action to address associated and often complex issues.

River users must be involved in the decision-making process. To ensure issues are addressed in the most efficient manner, working relationships between federal, state, and local waterway managers and industry user groups such as the AOPOA and ARERT and others, should be continuously cultivated and all applicable parties should be a part of the decision-making process.

USCG, USACE, and navigation interests must continually monitor hydrological and meteorological reports and the frequency of vessel incidents as indicators of navigational conditions. By analyzing developing trends, they can decide when system controls must be implemented to maintain an acceptable level of safety.

Section 4 discusses impacts to navigation that waterway managers can expect to occur during high water.

### **3.2 Marine Transportation Emergency Response Organization**

The waterway users of the MKARNS and its tributaries have a select group to contact when the need for communications arises. The federal governmental organizations that address industry concerns on the Arkansas River are the USCG and USACE Little Rock and Tulsa District. With the designation of an Assigned Dedicated Contact Person(s) (ADCP) by the industry, an ad hoc group consisting of industry, USCG, and USACE can respond promptly during a navigation transportation emergency or disruption on the MKARNS. At the outset of such an emergency, or as soon as practicable, the USCG will contact USACE and attempt to contact all applicable towing operators. However, in addition to the USACE, a minimum of three towing industry operators from APPENDIX I that can be reached by the USCG may serve as initial members of the response team for communications purposes.

### **3.3 System Management and Control**

Waterway management interventions must be taken when a compelling need exists to preserve the safety of navigation and the environment. Careful analysis of the risks must be conducted in each case, and controls should be exercised only to the extent necessary to mitigate these risks. In all cases, the controls imposed should be the least restrictive necessary. The degree of control can be escalated as conditions warrant. Control actions range from passive enforcement actions such as advisories, to drastic enforcement actions such as the temporary cessation of all navigation on the most seriously affected sections of the river system. When an intervention must be conducted on one part of the Arkansas River, other areas of the river must be considered. Care must be taken to recognize any restrictions put in place to address local safety issues and undue hardship on vessels and shippers on other parts of the river system.

#### **3.3.1 Safety Advisory**

The simplest form of intervention is a navigational safety advisory. It relies on the voluntary compliance of industry to limit risk and prevent vessel casualties. USCG advisories are usually issued after consultation with the USACE. Advisories can be originated by the USCG, disseminated as Broadcast Notice to Mariners (BNM) by industry, USACE Navigation Notice, over the industry facsimile system, or any combination of these methods. The purpose is to advise the marine industry of the existence of hazardous conditions and provide recommendations for safe navigation. Advisories can also be used to notify the marine industry of the Captain of the Port's (COTP) intention to take action in respect to developing navigation conditions. Advisories are important tools that can provide marine interests with time to adjust their operations to avoid future difficulties or potential safety implications.

### 3.3.2 Safety Zone

Consultation and deliberation with the USACE and industry user groups usually precede implementation of a safety zone by the USCG. A safety zone entails the control of a portion of the river, a tributary or a harbor and enables the USCG to control access and/or prescribe operating restrictions on vessels seeking to navigate in the area. This approach can be applied to limited or large geographical areas and may involve simple or complex restrictions including but not limited to:

- Minimum horsepower requirements per barge.
- Maximum draft limits.
- Maximum tow sizes.
- Specific tow configurations.
- Length and breadth limits.
- Safe speed zones, no passing zones or no meeting zones.
- Helper or towboat requirements.
- Traffic separation schemes.
- Reporting requirements.
- Tank barge prohibitions or the exclusion of all vessels from the safety zone.

The establishment of a safety zone may include active control of vessel traffic through an area, or it may be conducted passively, relying on voluntary compliance to limit risk. Safety zones using passive control have been imposed on other waterways during periods of high or abnormally low water and when local construction or pollution response cleanup operations could be impacted by passing traffic.

### 3.4 Communications

A special communication arrangement may be required for waterway users if one or more of the following conditions exist:

- There is an extended period of navigation stoppage and conditions are expected to worsen.
- Industry is experiencing difficulty in gaining timely information on river conditions.
- Severe congestion of harbors, terminals, and locks.
- An environmental emergency has developed, i.e., chemical or petroleum spill.
- Emergency closure of a lock.
- Failure of a navigation-related structure, i.e., downed bridge or power line, ruptured pipeline, etc.

Communication methods and preferences are discussed in Section 8.

### 3.5 Waterway Management Response

The response to a transportation emergency can be broken down into three distinct phases: **Watch Phase, Action Phase, and Recovery Phase**. Key events are associated with each phase and specific actions must be executed to ensure that safe and efficient responses are conducted.

Specific actions for each phase are listed in Section 4.1, Marine Transportation Emergency Response Cycle and criteria enumerated in APPENDIX II. Each phase is defined as follows:

#### WATCH PHASE

**Situation:** The Watch Phase is the start of a waterway management activity. It exists when navigation conditions may be affected by USACE water control actions or have markedly deteriorated, and weather forecasts predict continued abnormal rainfall and stream flow conditions. The USCG, local USACE personnel, and local river user groups will be the first to predict or become aware of difficulties being experienced by commercial navigation interests. This group must confer and decide if the developing scenario has the potential to evolve into a transportation emergency. If the situation has the potential for escalating, then a notice of intent to go to the Action Phase should be issued.

## **ACTION PHASE**

**Situation:** The Action Phase is the first condition, when active traffic advisories are issued, and extraordinary information coordination becomes necessary. Usually during the action phases, some vessels are navigating with difficulty and local navigation advisories and restrictions are defined to address hazardous areas. There exists a high probability that weather forecasts and hydrological projections indicate conditions will continue to worsen.

## **RECOVERY PHASE**

**Situation:** The Recovery Phase starts once limited navigation can be resumed on the affected section of river system. It is characterized by improving navigation and weather conditions, rivers returning to normal stages and re-establishment of the ATON system. In the early part of the Recovery Phase, traffic may move at reduced capacity under the active control of the USCG. As conditions improve, operating restrictions are gradually removed, and navigation resumes without active direction. This phase ends when active management is no longer required and navigational advisories are used in lieu of operating restrictions. The USCG will communicate the cessation of any restrictions or advisories.

APPENDIX II, III, & IV provides additional information on the actions to be taken during the Watch, Action, and Emergency phases of high or low water events.

### **3.6 Emergency Waterway Management**

The complexity of the river system and the number of factors involved in its management make it essential that a proactive approach be taken concerning waterway management activities. To ensure prevention and response activities are conducted most efficiently, it is essential that river users and managers participate in the decision-making process. These users should meet regularly (such as semiannual AOPOA meetings) to review existing conditions, assess the possibility of future emergencies, and review contingency planning.

## **4. WATERWAY MANAGEMENT ISSUES ASSOCIATED WITH HIGH FLOWS**

The purpose of this section is to list the impacts waterway managers can expect during a high flow event. High flow or flood conditions will be marked by deterioration of navigating conditions due to swift currents, heavy debris flow, and the degradation of the ATON system. These conditions may result in vessel casualties, pollution incidents and barge breakaways. Additional impacts of a high-water event are listed below:

### **IMPACTS ON NAVIGATING TOWS**

- Vessels navigating against the current face the potential for stall outs and loss of control.
- Vessels have difficulty arranging to meet and pass due to effects of the current.
- Heavy debris flow causes damage to rudders and propellers, as well as damage to barges.
- Vessels have difficulty approaching lock walls.
- Landings and passages through bridges become more difficult to navigate due to abnormal drafts and currents, increasing the possibility of allision incidents to bridge fendering systems.
- Close quarter maneuvers and tow building are more difficult.
- Downbound vessels have difficulty controlling their speed, complicating close aboard maneuvering during passing situations.
- Lock approaches by downbound tows are influenced by abnormal out or in drafts that lead to potential increase in allisions with lock structures.
- High currents and subsequent full power maneuvers over stress tow rigging, increasing the possibility of tow breakups.

## **IMPACTS ON MOORED, FLEETED VESSELS, AND FACILITIES**

- Fleet anchors and dead men are strained and undermined by high flow and current, increasing the potential for breakaways.
- Tow building and midstream operations become difficult. Fleeting operations require increased monitoring to prevent breakaways.
- Harbor activity decreases and a lesser number of vessels are available to respond to harbor emergencies.
- Loading and unloading facilities become inactive due to crane limitations.
- Increased fleet congestion.
- Increased demand by river-dependent industries for raw material/stock.
- Large passenger vessels experience difficulty in maneuvering.
- Requests by shoreline facilities for passage or critical cargoes.

## **IMPACTS WHEN NAVIGATION IS HALTED**

- Vessels trapped in the closure area require replenishment of fuel, potable water, and groceries.
- Local law enforcement and relief agencies request small boat transportation to deliver aid.
- Fleets require line boats to assist in maintaining security.
- Tension may develop between landowners and fleeted or passing vessels.
- Recreational boaters and marinas operate despite river closure.

### **4.1 Marine Transportation Emergency Response Cycle**

The purpose of this section is to provide guidance for planning and executing waterway management intervention actions during a marine transportation emergency.

The response to a transportation emergency can be broken down into three distinct phases: Watch Phase, Action Phase, and Recovery Phase. Key events are associated with each phase and specific actions must be executed to ensure that safe and efficient responses are conducted.

## **WATCH PHASE**

When a transportation incident is imminent USCG, USACE, and transportation officials should respond as follows:

1. USACE/USCG will arrange the initial conference call between the industry, government stakeholders, etc., when it is anticipated that navigation conditions will worsen.
2. Activate previously assigned dedicated contact persons and support staff.
3. Notify affected parties that the emergency communication network is being activated.
4. Determine resource and logistic needs.
5. Establish a briefing schedule.

## **ACTION PHASE**

This is the point when USCG, USACE, and transportation officials have determined that a transportation incident exists. They should:

1. Update information from the Watch Phase and activate more frequent communication.
2. Convene a joint conference to determine the impact of anticipated scenarios so that the best possible alternative may be selected in advance of actual implementation.
3. Issue an advisory to affected waterway users that reflects the situation and anticipated actions.
4. The USCG releases appropriate navigational advisories and broadcasts (SMIBs, MSIBs, BNMs, ect) to announce restrictions. The content of such may also direct mariners to the appropriate USACE navigation notice.
5. Augment staff (if necessary) for previously assigned dedicated contact persons.
6. Establish an information system for gathering pilot input on navigating conditions via industry.
7. Increase surveillance to capture real time pictures of river conditions.
8. The USCG assesses the need for a news release(s) outlining the situation, and planned intervention activities.
9. Initiate development of policies for vessel queuing, test tow procedures, special movements, vessel replenishment and reduced crewing.
10. The USCG will assess the need for a safety zone in preparation for the cessation of navigation within the affected area.

## **RECOVERY PHASE**

During this phase USCG, USACE, and transportation officials have determined that a transportation incident is abating or no longer exists. They should:

1. Continue with telephone conferences if warranted to examine the incident and update information in the Action Phase.
2. Unless otherwise indicated, provide updates through news releases, broadcasts, and Internet site updates.
3. Evaluate any imposed operating restrictions and issue updated navigational advisories as necessary.
4. Announce the end of the incident through news releases, BNMs, NAVNOTs and other means possible.
5. Conduct an After-Action Review of the operation to capture lessons learned.
6. Draft an after-action report and incident history to be used in refining the MKARNS WAP.
7. Collect and archive pertinent records of the response.
8. Return the assigned dedicated contact persons to their normal functions.

## 5. LOW FLOWS

During periods of low water navigation may be constrained by the amount of water the USACE can make available. Tows may encounter reduced channel widths and draft limitations. **During winter drawdowns for flood control, the USACE augments flows to facilitate commercial traffic.** APPENDIX III LOW WATER provides pertinent information.

## 6. ENVIRONMENTAL OR OTHER EMERGENCIES

At times situations develop that are not related to the weather. Bridge construction accidents, downing of electrical transmission lines or chemical or petroleum spills may require navigation interruption by the USCG. During these periods the USCG has control of the situation and makes the necessary decisions. Pertinent information about these events is distributed using the communications guidelines of the MKARNS WAP.

## 7. AUTHORITIES AND RESPONSIBILITIES

Successful management of any traffic incident is dependent on the cooperation of the waterway system participants. These include agencies of the federal government, state and local emergency management agencies, and industry groups. This chapter identifies the key organizations in these areas, outlines their authorities and responsibilities and explains their involvement with traffic management during a river incident.

### 7.1 Federal Agencies

There are two federal agencies primarily responsible for actions relating to navigation on the MKARNS, USCG and USACE. Federal law provides the requisite authority for establishing and maintaining a clear navigational path throughout U.S. territorial waters. Included as part of a national waterway system is the MKARNS and its tributaries which are part of the inland waterway system. Primarily, the USCG regulates navigation on these "navigable waters of the United States." The USACE provides technical advice to the USCG to enable them to properly evaluate and make decisions on navigation safety matters. The USACE is responsible for authorizing waterway projects on the MKARNS, evaluating, and maintaining navigation facilities and channels and directing emergency flood control operations.

#### 7.1.1 U.S. Coast Guard

United States Coast Guard: Title 14, USC, defines USCG roles and responsibilities in establishing and maintaining the safety of ports and waterways. 33 CFR 165.20 gives COTPs and USCG District Commanders the authority to impose safety zones, security zones and other restrictions to ensure the safe flow of navigation.

The COTP for the MKARNS is the Sector Commander of USCG Sector Lower Mississippi River located in Memphis, TN.

#### 7.1.2 U.S. Army Corps of Engineers - Little Rock District and Tulsa District

United States Army Corps of Engineers: Title 33, U.S. Code defines USACE roles and responsibilities regarding development of or changes to waterfront facilities, weirs, dams or dikes. Specifically, the USACE is authorized to review and approve all changes to hydrodynamic structures for the purposes of maintaining a navigable channel. In addition, the USACE is charged with conducting waterworks operations to maintain the physical nature of a navigable channel on particular waterways.

#### 7.1.3 U.S. Army Corps of Engineers - Southwest Division

The USACE - Southwest Division is coordinated with during high and low flows to minimize impacts.

### 7.2 State and Local Governments

State and County Emergency Management and public safety personnel represent local interests and can significantly impact traffic management decisions. Though it is not always practical to involve local interests in traffic management decisions, particularly when they involve federal statutory requirements, State and County Emergency Management Agencies should be consulted and informed of decisions that may have an effect on local waterways and overall public safety. If necessary for successful problem resolution, an invitation may be extended to a state or local agency to participate in a particular emergency traffic event.

### **7.3 Industry Groups**

As the principal river users and experts, industry groups should be called upon to provide assistance during waterway management activities. The Arkansas Oklahoma Port Operators Association (AOPOA) is the primary organization available to provide these services on the MKARNS. Designated contact members of MKARNS are listed in APPENDIX I.

## **8. COMMUNICATIONS**

Efficient and effective communication can prevent or minimize damage and/or losses that can occur due to a navigation transportation emergency. With accurate up-to-date information, towboat operators can make necessary decisions to minimize their risk and potential damage to the navigation system.

Communication between towboat operators, USACE, and USCG will ensure vessel locations are current and decisions are based on timely information.

Effective communications have three distinct phases: collection, processing and dissemination. The USACE and USCG staffs must gather as much information as possible, verify its accuracy and then assure its proper and timely dissemination. Timely reports should be provided to the public affairs officers of USACE and USCG for dissemination to interested parties.

### **COMMUNICATION METHODS**

MKARNS stakeholders will communicate, primarily by conference call, to reach timely decisions affecting the waterway. The following discusses the additional means where the summary of conference calls can be disseminated.

The best method of effective and timely communication includes utilization of electronic technology such as the Internet, electronic mail, auto attendant phone systems, and fax on demand. USACE, USCG, and most towing companies have Internet sites. Appropriate information will be posted on these sites and updated as frequently as possible as the information changes.

Important information can be disseminated from the USCG as a Broadcast Notice to Mariners (BNM), or from USACE as a Navigation Notice. Other information systems such as fax on demand and auto attendant phone systems should be available for those who do not have Internet access.

There are times when person-to-person contact is the best way to communicate during an incident. Personal attention to the concerns of key customers and local emergency operations staff can eliminate feeling of mistrust or apprehension. The use of person-to-person contact takes more time than other communication methods and therefore it should be used judiciously.

While the goal of this plan is to minimize reliance on telephone voice to voice contact, that option still exists. By using current technology, information can be properly detailed and frequently updated and the number of phone conversations minimized.

## **9. PUBLIC INFORMATION**

The general public has a major investment in the timely restoration of navigation and marine commerce following a river incident or closure. Extended closures create a tremendous adverse impact on local and regional economies. Therefore, accurate emergency information should be disseminated to the public as expeditiously as possible through every available channel, including, but not limited to the Internet and automated phone services.

**Action Plan**

White River – High Velocity Operations

CRITICAL AREA DESCRIPTION	TRIGGER	TREND	DESCRIPTION	PHASE	ACTION
<p><b>Zone 1</b></p> <p><b>White River Entrance Channel (WREC) to Arkansas Post Canal</b></p> <p><b>WHITE RIVER</b></p> <p><b>NM 0.0 to 19.0</b></p> <p>WREC Differential = Lock No. 1 Tailwater - MPLD Headwater</p> <p><a href="#">USACE SWL MKARNS Real-time Data</a></p> <p><a href="#">NWS Advanced Hydrologic Prediction Service - LZK</a></p> <p><a href="#">USACE Arkansas R. Flow Forecast</a></p> <p><a href="#">USACE WREC Long Range Forecast</a></p>	Differential < 2.0 feet	-	Normal Conditions	Normal Ops	•No restriction.
	Differential 2.0 feet	Increasing	High Differential	Watch	•No restriction. •Exercise caution in the WREC. •Industry intensifies monitoring of forecasts and developing conditions.
	Differential 3.0 feet	Increasing	High Differential	Action	•Exercise extreme caution in the WREC especially when passing through Montgomery Point Lock and Dam (MPLD). •Recommend tow size reduction. •No northbound restriction. •Liquid Cargo Vessel (Tanker) - consider daylight only for southbound vessels. •Dry Cargo Vessel (Hopper) - 12 barge southbound restriction.
	Differential 4.0 feet	Increasing	High Differential	Action	•No northbound restriction. •Liquid Cargo Vessel (Tanker) - recommend daylight only for southbound vessels. •Dry Cargo Vessel (Hopper) - 12 barge southbound restriction. •For White River at Clarendon Flows exceeding 60,000 cfs exercise extreme caution especially when passing MPLD.
	Differential 4.5 feet	Increasing	High Differential	Action	•No northbound restriction. •Liquid Cargo Vessel (Tanker) - highly recommend daylight only for southbound vessels. •Dry Cargo Vessel (Hopper) – recommend 9 barge southbound restriction.
	Differential 5.1 - 5.9 feet	Increasing	High Differential	Action	•No northbound restriction. •Liquid Cargo Vessel (Tanker) - highly recommend suspending navigation. •Dry Cargo Vessel (Hopper) – recommend 4 barge southbound restriction during daylight; 2 barge southbound restriction during night.
	Differential > 5.9 feet	Increasing	Extreme High Differential	Action	•Highly recommend suspending all navigation until conditions improve.

White River - High Velocity Operations (Continued)

CRITICAL AREA DESCRIPTION	TRIGGER	TREND	DESCRIPTION	PHASE	ACTION
<p style="text-align: center;">Zone 1</p> <p style="text-align: center;">White River Entrance Channel (WREC) to Arkansas Post Canal</p> <p style="text-align: center;">WHITE RIVER</p> <p style="text-align: center;">NM 0.0 to 19.0</p> <p>WREC Differential = Lock No. 1 Tailwater - MPLD Headwater</p> <p><a href="#">USACE SWL MKARNS Real-time Data</a></p> <hr/> <p><a href="#">NWS Advanced Hydrologic Prediction Service - LZK</a></p> <p><a href="#">USACE Arkansas R. Flow Forecast</a></p> <p><a href="#">USACE WREC Long Range Forecast</a></p>	Differential 5.1 - 5.9 feet	Decreasing	High Differential	Action	<ul style="list-style-type: none"> <li>•Liquid Cargo Vessel (Tanker) - highly recommend continuing suspension of navigation.</li> <li>•Dry Cargo Vessel (Hopper) - Resume 4 barge southbound restriction during daylight; 2 barge southbound restriction during night.</li> <li>•No northbound restriction.</li> </ul>
	Differential 5.0 feet	Decreasing	High Differential	Action	<ul style="list-style-type: none"> <li>•No northbound restriction.</li> <li>•Liquid Cargo Vessel (Tanker) - highly recommend continuing suspension of navigation.</li> <li>•Dry Cargo Vessel (Hopper) -recommend 9 barge southbound restriction.</li> </ul>
	Differential 4.4 feet	Decreasing	High Differential	Action	<ul style="list-style-type: none"> <li>•No northbound restriction.</li> <li>•Liquid Cargo Vessel (Tanker) - recommend daylight only for southbound vessels.</li> <li>•Dry Cargo Vessel (Hopper) - recommend 12 barge southbound restriction.</li> </ul>
	Differential 2.9 feet	Decreasing	High Differential	Recovery Phase	<ul style="list-style-type: none"> <li>•No restriction.</li> <li>•Exercise caution in the WREC.</li> </ul>
	Differential 2.0 feet	Decreasing	Normal Conditions	Normal Ops	<ul style="list-style-type: none"> <li>•No restriction.</li> </ul>

Arkansas River - High Flow Operations

CRITICAL AREA DESCRIPTION	TRIGGER	TREND	DESCRIPTION	PHASE	ACTION
<p style="text-align: center;">Zone 2</p> <p style="text-align: center;">Arkansas Post Canal Entrance (Pool 2) to Fort Smith (Pool 13)</p> <p style="text-align: center;">ARKANSAS RIVER</p> <p style="text-align: center;">NM 19.0 to 308.6</p> <p><a href="#">USACE SWL MKARNS Real-time Data</a></p> <p><a href="#">NWS Advanced Hydrologic Prediction Service - LZK</a></p> <p><a href="#">USACE Arkansas R. Flow Forecast</a></p> <p><a href="#">USACE Long Range Flow Forecast</a></p>	70,000 cfs	Rising	Normal Operations	Watch	<ul style="list-style-type: none"> <li>•USACE issues Small Craft Advisory.</li> <li>•Industry intensifies monitoring of forecasts and developing conditions.</li> <li>•Exercise extreme caution as dikes begin to submerge.</li> <li>•Assess need for daylight/visibility/one way traffic restrictions.</li> </ul>
	100,000 cfs	Rising	High Flow	Action	<ul style="list-style-type: none"> <li>•Assess need for USCG safety broadcasts/zones concerning high velocity currents/drafts in specific areas.</li> <li>•Recommend daylight only for southbound vessels.</li> <li>•Consider HP/loaded barge/tow size restrictions.</li> <li>•Liquid Cargo Vessel (Tanker) – recommend minimum 800hp/loaded barge for 4 barge tow; southbound vessels daylight only.</li> <li>•Dry Cargo Vessel (Hopper) - recommend minimum 400hp/loaded barge for 9 barge tow.</li> </ul>
	150,000 cfs	Rising	High Flow	Action	<ul style="list-style-type: none"> <li>•Recommend daylight only for all vessels.</li> <li>•Recommend expanding HP/loaded barge/tow size restrictions.</li> <li>•Liquid Cargo Vessel (Tanker) - minimum 1600hp/loaded barge for 2 barge tow; maximum tow width of 54 feet (1 barge width); southbound and northbound daylight only.</li> <li>•Dry Cargo Vessel (Hopper) - minimum 650hp/loaded barge for 6 barge tow; maximum tow width 70 feet (2 barge width); southbound and northbound daylight only.</li> </ul>
	165,000 to 180,000 cfs	Rising	High Flow	Action	<ul style="list-style-type: none"> <li>•Consideration of pool/river elevations with respect to bridge clearances, dike submergence, and lock closures must be given; extreme caution must be used while navigating.</li> <li>•Highly recommend suspending navigation for Vessels/Tows.</li> </ul>
	150,000 cfs	Falling	High Flow	Recovery Phase	<ul style="list-style-type: none"> <li>•Recommend daylight only for southbound vessels.</li> <li>•Liquid Cargo Vessel (Tanker) - minimum 1600hp/loaded barge for 2 barge tow; maximum tow width of 54 feet (1 barge width). southbound and northbound daylight only.</li> <li>•Dry Cargo Vessel (Hopper) - minimum 400hp/loaded barge for 9 barge tow.</li> </ul>

Arkansas River - High Flow Operations (Continued)

CRITICAL AREA DESCRIPTION	TRIGGER	TREND	DESCRIPTION	PHASE	ACTION
<p style="text-align: center;"><b>Zone 2</b></p> <p style="text-align: center;">Arkansas Post Canal Entrance (Pool2) to Fort Smith (Pool 13)</p> <p style="text-align: center;">ARKANSAS RIVER</p> <p style="text-align: center;">NM 19.0 to 308.6</p> <p><a href="#">USACE SWL MKARNS Real-time Data</a></p> <p><a href="#">NWS Advanced Hydrologic Prediction Service - LZK</a></p> <p><a href="#">USACE Arkansas R. Flow Forecast</a></p> <p><a href="#">USACE Long Range Flow Forecast</a></p>	100,000 cfs	Falling	High Flow	Recovery Phase	<ul style="list-style-type: none"> <li>•Relax HP/loaded barge/tow size &amp; daylight only restrictions.</li> <li>•Cancel USCG safety broadcasts/zones and resume normal traffic patterns and tow sizes.</li> </ul>
	70,000 cfs	Falling	Normal Operations	Normal Ops	<ul style="list-style-type: none"> <li>•USACE lifts Small Craft Advisory.</li> <li>•When flow recedes to 60,000 cfs USACE conducts channel reconnaissance surveys to identify shoaled areas.</li> <li>•As shoaling is identified USACE issues Navigation Notice with sailing instructions and redirects USACE dredge/survey services.</li> <li>•Schedule hotwash activity, if appropriate, to refine or update plan.</li> </ul>

Arkansas River - High Flow Operations

CRITICAL AREA DESCRIPTION	TRIGGER	TREND	DESCRIPTION	PHASE	ACTION
<p style="text-align: center;"><b>Zone 3</b></p> <p>Fort Smith (Pool 13) to Muskogee (Pool 16)</p> <p style="text-align: center;">ARKANSAS RIVER</p> <p style="text-align: center;">NM 308.6 to 395.0</p> <p><a href="#">Webbers Falls Lock and Dam (No. 16)</a></p> <p><a href="#">Robert S. Kerr Lock and Dam (No. 15)</a></p> <p><a href="#">W.D. Mayo Lock and Dam (No. 14)</a></p> <p><a href="#">NWS Advanced Hydrologic Prediction Service - TSA</a></p>	70,000 cfs	Rising	Normal Operations	Watch	<ul style="list-style-type: none"> <li>•USACE issues Small Craft Advisory.</li> <li>•Industry intensifies monitoring of forecasts and developing conditions.</li> <li>•Exercise extreme caution as dikes begin to submerge.</li> <li>•Assess need for daylight/visibility/one way traffic restrictions.</li> </ul>
	100,000 cfs	Rising	High Flow	Action	<ul style="list-style-type: none"> <li>•Assess need for USCG safety broadcasts/zones concerning high velocity currents/drafts in specific areas.</li> <li>•Recommend daylight only for southbound vessels.</li> <li>•Consider HP/loaded barge/tow size restrictions.</li> <li>•Liquid Cargo Vessel (Tanker) – recommend southbound and northbound vessels minimum 800hp/loaded barge for 4 barge tow; southbound vessels daylight only.</li> <li>•Dry Cargo Vessel (Hopper) – recommend minimum 400hp/loaded barge for 9 barge tow.</li> </ul>
	150,000 cfs	Rising	High Flow	Action	<ul style="list-style-type: none"> <li>•Recommend daylight only for all vessels.</li> <li>•Recommend expanding HP/loaded barge/tow size restrictions.</li> <li>•Liquid Cargo Vessel (Tanker) – recommend minimum 1600hp/loaded barge for 2 barge tow; maximum tow width of 54 feet (1 barge width); southbound and northbound daylight only.</li> <li>•Dry Cargo Vessel (Hopper) – recommend minimum 600hp/loaded barge for 6 barge tow; maximum tow width 70 feet (2 barge width); southbound and northbound daylight only.</li> </ul>
	165,000 to 180,000 cfs	Rising	High Flow	Action	<ul style="list-style-type: none"> <li>•Consideration of pool/river elevations with respect to bridge clearances, dike submergence, and lock closures must be given; extreme caution must be used while navigating.</li> <li>•Highly recommend suspending navigation for Tanker and Hopper Vessels.</li> </ul>
	165,000 cfs	Falling	High Flow	Recovery Phase	<ul style="list-style-type: none"> <li>•Consider navigation resuming for 2 barge Tanker vessels and 6 barge Hopper vessels.</li> <li>•Consideration of pool/river elevations with respect to bridge clearances, dike submergence, and lock closures must be given; extreme caution must be used while navigating.</li> </ul>

Arkansas River - High Flow Operations (Continued)

CRITICAL AREA DESCRIPTION	TRIGGER	TREND	DESCRIPTION	PHASE	ACTION
<p style="text-align: center;"><b>Zone 3</b></p> <p style="text-align: center;">Fort Smith (Pool 13) to Muskogee (Pool 16)</p> <p style="text-align: center;">ARKANSAS RIVER</p> <p style="text-align: center;">NM 308.6 to 395.0</p> <p><a href="#">Webbers Falls Lock and Dam (No. 16)</a></p> <p><a href="#">Robert S. Kerr Lock and Dam (No. 15)</a></p> <p><a href="#">W.D. Mayo Lock and Dam (No. 14)</a></p> <p><a href="#">NWS Advanced Hydrologic Prediction Service - TSA</a></p>	150,000 cfs	Falling	High Flow	Recovery Phase	<ul style="list-style-type: none"> <li>•USCG Safety broadcasts/zones concerning high velocity currents/drafts in specific areas.</li> <li>•Recommend daylight only for southbound vessels.</li> <li>•Liquid Cargo Vessel (Tanker) -consider resuming with minimum 1600hp/loaded barge for 2 barge tow; maximum tow width of 54 feet (1 barge width); southbound and northbound daylight only.</li> <li>•Dry Cargo Vessel (Hopper) - Consider resuming with minimum 600hp/loaded barge for 6 barge tow all directions.</li> </ul>
	100,000 cfs	Falling	High Flow	Recovery Phase	<ul style="list-style-type: none"> <li>•Relax daylight only restrictions.</li> <li>•Liquid Cargo Vessel (Tanker) -consider resuming with minimum 800hp/loaded barge for 4 barge tow all directions.</li> <li>•Dry Cargo Vessel (Hopper) -consider resuming with minimum 400hp/loaded barge for 9 barge tow all directions.</li> <li>•Cancel USCG safety broadcasts/zones and resume normal traffic patterns and tow sizes.</li> </ul>
	70,000 cfs	Falling	Normal Operations	Normal Ops Watch	<ul style="list-style-type: none"> <li>•USACE lifts Small Craft Advisory.</li> <li>•When flow recedes USACE conducts channel reconnaissance surveys to identify shoaled areas.</li> <li>•As shoaling is identified USACE issues Navigation Notice with sailing instructions and redirects USACE dredge/survey services.</li> <li>•Schedule hotwash activity, if appropriate, to refine or update plan.</li> </ul>

Verdigris River - High Flow Operations

CRITICAL AREA DESCRIPTION	TRIGGER	TREND	DESCRIPTION	PHASE	ACTION
<p style="text-align: center;"><b>Zone 4</b></p> <p style="text-align: center;"><b>Muskogee (Pool 16) to Catoosa (Pool 18)</b></p> <p style="text-align: center;">VERDIGRIS RIVER</p> <p style="text-align: center;">NM 395.0 to 445.0</p> <p><a href="#">Newt Graham Lock and Dam (No. 18)</a></p> <p><a href="#">Chouteau Lock and Dam (No. 17)</a></p>	0 to 10,000 cfs	Rising	Normal Operations	Watch	<ul style="list-style-type: none"> <li>•USACE issues navigation notice.</li> <li>•Industry intensifies monitoring of forecasts and developing conditions.</li> <li>•Exercise extreme caution as dikes begin to submerge.</li> <li>•Assess need for daylight/visibility/one way traffic restrictions.</li> </ul>
	20,000 to 25,000 cfs	Rising	High Flow	Action	<ul style="list-style-type: none"> <li>•USCG safety broadcasts/zones concerning high velocity currents/drafts in specific areas.</li> <li>•Recommend obtaining updated forecast.</li> <li>•Recommend HP/loaded barge/tow size restrictions.</li> <li>•Liquid Cargo Vessel (Tanker) – recommend minimum 1600hp/loaded barge for 2 barge tow; maximum tow width of 54 feet (1 barge width); southbound and northbound daylight only; stop 4 barge tows.</li> <li>•Dry Cargo Vessel (Hopper) - recommend minimum 650hp/loaded barge for 6 barge tow; maximum tow width 70 feet (2 barge width); southbound daylight only; northbound should consider daylight only.</li> </ul>
	25,000 to 30,000 cfs	Rising	High Flow	Action	<ul style="list-style-type: none"> <li>•USCG safety broadcasts/zones concerning high velocity currents/drafts in specific areas.</li> <li>•Recommend obtaining updated forecast.</li> <li>•Liquid Cargo Vessel (Tanker) - highly recommend suspending navigation.</li> <li>•Dry Cargo Vessel (Hopper) – recommend minimum 650hp/loaded barge for 6 barge tow; maximum tow width 70 feet (2 barge width); southbound and northbound daylight only.</li> </ul>
	30,000 cfs	Rising	High Flow	Action	<ul style="list-style-type: none"> <li>•Consideration of pool/river elevations with respect to bridge clearances, dike submergence, and lock closures must be given; extreme caution must be used while navigating.</li> <li>•Highly recommend suspending navigation for all Vessels.</li> </ul>

Verdigris River - High Flow Operations (Continued)

CRITICAL AREA DESCRIPTION	TRIGGER	TREND	DESCRIPTION	PHASE	ACTION
<p style="text-align: center;">Zone 4</p> <p>Muskogee (Pool 16) to Catoosa (Pool 18)</p> <p>VERDIGRIS RIVER</p> <p>NM 395.0 to 445.0</p> <p><a href="#">Newt Graham Lock and Dam (No. 18)</a></p> <p><a href="#">Chouteau Lock and Dam (No. 17)</a></p>	20,000 to 30,000 cfs	Falling	High Flow	Recovery Phase	<ul style="list-style-type: none"> <li>•USCG Safety broadcasts/zones concerning high velocity currents/drafts in specific areas.</li> <li>•Recommend obtaining updated forecast.</li> <li>•Liquid Cargo Vessel (Tanker) - Consider resuming with minimum 1600hp/loaded barge for 2 barge tow all directions; southbound and northbound vessels daylight only.</li> <li>•Dry Cargo Vessel (Hopper) - Consider resuming with minimum 650hp/loaded barge for 6 barge tow all directions; southbound and northbound vessels daylight only.</li> </ul>
	0 to 20,000 cfs	Falling	Normal Operations	Normal Ops Watch	<ul style="list-style-type: none"> <li>•Relax HP/loaded barge/tow size &amp; daylight only restrictions.</li> <li>•USACE issues navigation notice.</li> <li>•Cancel safety broadcasts/zones and resume normal traffic patterns and tow sizes.</li> <li>•When flow recedes USACE conducts channel reconnaissance surveys to identify shoaled areas.</li> <li>•As shoaling is identified USACE issues Navigation Notice with sailing instructions and redirects USACE dredge/survey services.</li> <li>•Schedule hotwash activity, if appropriate, to refine or update plan.</li> </ul>

## Broadcast Notice to Mariners Examples

### HIGH WATER BROADCAST NOTICE TO MARINERS (BNM)

### HIGH WATER BROADCAST NOTICE TO MARINERS (BNM)

THE COTP LOWER MISSISSIPPI RIVER IS ISSUING A SAFETY ADVISORY DUE TO THE EXPECTED RAPID INCREASE IN RIVER LEVELS ON THE ARKANSAS RIVER OVER THE NEXT SEVERAL DAYS. MARINERS ARE ADVISED TO TRANSIT THE AREA WITH CAUTION DUE TO THE HAZARDOUS CONDITIONS ASSOCIATED WITH STRONG CURRENTS, SEVERE OUT DRAFTS, MISSING/OFF STATION ATON, AND DIVING BUOYS. FLEET OPERATORS SHOULD REGULARLY CHECK THEIR FLEETS AND IMMEDIATELY REPORT BARGE BREAKAWAYS TO THE USCG.

### HIGH WATER BNM      HP RESTRICTION

1. THE COTP LOWER MISSISSIPPI RIVER IS ISSUING A HIGH WATER SAFETY ADVISORY FOR THE ARKANSAS RIVER FROM MILE MARKER      TO     .
2. MARINERS ARE ADVISED TO TRANSIT THE ARKANSAS RIVER WITH CAUTION DUE TO THE HAZARDOUS CONDITIONS ASSOCIATED WITH STRONG CURRENTS, SEVERE OUTDRAFTS, MISSING/OFF STATION ATON AND DIVING BUOYS.
3. THE COTP WITH THE CONCURRENCE OF APOPA/ ARERT/ USACE RECOMMENDS THE FOLLOWING LIMITS FOR TOWS WHEN THE      GAUGE REACHES      ' FT AND/OR      GAUGE REACHES      ' FT AND/OR      GAUGE REACHES      ' FT AND WILL BE TRANSITING THE ARKANSAS RIVER FROM MILE MARKER      TO MILE MARKER     .
4. ALL DOWN-BOUND TOWS:
  - A. TOWING VESSELS MUST HAVE AT LEAST      HP PER LOADED BARGE WITH A MAXIMUM TOW SIZE OF      BARGES.
5. FLEET OPERATORS SHOULD REGULARLY CHECK THEIR FLEETS AND IMMEDIATELY REPORT BARGE BREAKAWAYS TO THE U.S. COAST GUARD.
6. MARINERS ARE REQUESTED TO CONTACT SECTOR LMR ON CH 16 VHF-FM OR 1-866-777-2784 FOR FURTHER INFORMATION OR THE REPORT AREAS OF CONCERN.