



U.S. ENVIRONMENTAL PROTECTION AGENCY

OFFICE OF INSPECTOR GENERAL

*Ensuring clean and safe water
Partnering with states and other stakeholders*

Region 4 Quickly Assessed Water Systems After Hurricane Irma but Can Improve Emergency Preparedness

Report No. 20-P-0001

October 7, 2019



Report Contributors:

Julie Hamann
Jayne Lilienfeld-Jones
Tim Roach
Johnny Ross
Khadija Walker

Abbreviations

EPA	U.S. Environmental Protection Agency
ESF	Emergency Support Function
FDEP	Florida Department of Environmental Protection
FEMA	Federal Emergency Management Agency
FlaWARN	Florida Water/Wastewater Agency Response Network
NRF	National Response Framework
OIG	Office of Inspector General
USACE	U.S. Army Corps of Engineers
WERT	Water Emergency Response Team

Cover Photo: EPA Region 4 mobile command post in St. Petersburg, Florida. (EPA photo)

Are you aware of fraud, waste or abuse in an EPA program?

EPA Inspector General Hotline

1200 Pennsylvania Avenue, NW (2431T)
Washington, DC 20460
(888) 546-8740
(202) 566-2599 (fax)
[OIG Hotline@epa.gov](mailto:OIG_Hotline@epa.gov)

Learn more about our [OIG Hotline](#).

EPA Office of Inspector General

1200 Pennsylvania Avenue, NW (2410T)
Washington, DC 20460
(202) 566-2391
www.epa.gov/oig

Subscribe to our [Email Updates](#)
Follow us on Twitter [@EPAoig](#)
Send us your [Project Suggestions](#)



At a Glance

Why We Did This Project

The U.S. Environmental Protection Agency's (EPA's) Office of Inspector General (OIG) is conducting an audit to determine how the EPA's preparedness and response efforts for the three major hurricanes of calendar year 2017—Harvey, Irma and Maria—protected human health and water resources from storm-related drinking water and surface water contamination. This report addresses EPA Region 4 water-related preparedness and response efforts for Hurricane Irma. Hurricanes Harvey and Maria are addressed in separate OIG reports.

Hurricane Irma made landfall in Florida on September 10, 2017. The National Hurricane Center rated the hurricane as a Category 4 storm, with wind speeds of 130 miles per hour when it reached Florida. Over half of the state's residents were left without power and the storm caused \$50 billion in damage to residential and commercial property. In addition, the storm impacted approximately 85 percent of the state's drinking water and wastewater facilities.

This report addresses the following:

- *Ensuring clean and safe water.*
- *Partnering with states and other stakeholders.*
- *Operating efficiently and effectively.*

Address inquiries to our public affairs office at (202) 566-2391 or OIG_WEBCOMMENTS@epa.oig.

[List of OIG reports.](#)

Region 4 Quickly Assessed Water Systems After Hurricane Irma but Can Improve Emergency Preparedness

What We Found

The EPA completed its Hurricane Irma mission assignment, to assess water systems, within a 15-day period. Region 4's water emergency response team gathered and reported data on the status of drinking and wastewater facilities and response efforts in Florida—the only state where the Federal Emergency Management Agency (FEMA) tasked Region 4 with a mission assignment. The state's drinking water and wastewater facilities returned to service within days or weeks after the hurricane, limiting the public's exposure to contaminated water.

EPA staff training with state partners and development of standard operating procedures could improve emergency response.

Region 4's close working relationship with the Florida Department of Environmental Protection and the development of a supplemental database to complement the state's water and wastewater data systems were key factors in protecting human health and water resources in the aftermath of Hurricane Irma. Region 4 developed a draft standard operating procedure for managing an emergency response in 2010, which was revised in 2012, that addresses these issues, but the procedure was never finalized. We found that some EPA staff members were unfamiliar with some of the region's internal emergency response protocols. We also found that the Water Division had not conducted any emergency response training or exercises with its state partners in preparation for Hurricane Irma. By finalizing procedures and conducting regular training, Region 4 can improve the efficiency and effectiveness of its response efforts.

Recommendations and Planned Agency Corrective Actions

We recommend that the EPA Region 4 Regional Administrator direct the Water Division to finalize its standard operating procedure for disaster response and conduct annual hurricane emergency response exercises with state partners.

Region 4 agreed with the two recommendations and implemented corrective actions for Recommendation 2 by beginning to conduct annual hurricane emergency response exercises with state partners. The corrective actions for Recommendation 2 are complete upon issuance of this report. A corrective action for Recommendation 1—finalizing a standard operating procedure for disaster response—is pending.



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

OFFICE OF
INSPECTOR GENERAL

October 7, 2019

MEMORANDUM

SUBJECT: Region 4 Quickly Assessed Water Systems After Hurricane Irma but Can Improve
Emergency Preparedness
Report No. 20-P-0001

FROM: Charles J. Sheehan, Deputy Inspector General

A handwritten signature in blue ink that reads "Charles J. Sheehan".

TO: Mary S. Walker, Regional Administrator
Region 4

This is our report on the subject assignment conducted by the Office of Inspector General (OIG) of the U.S. Environmental Protection Agency (EPA). The project number for this audit was OPE-FY18-0005. This report contains findings that describe the problems that the OIG has identified and corrective actions the OIG recommends. This report represents the opinion of the OIG and does not necessarily represent the final EPA position. Final determinations on matters in this report will be made by EPA managers in accordance with established audit resolution procedures.

The EPA Region 4 Regional Administrator is responsible for the issues discussed in this report.

In accordance with EPA Manual 2750, your office provided acceptable corrective actions and milestone dates in response to OIG recommendations. Recommendation 1 is resolved with corrective action pending, while Recommendation 2 is completed with no further action required. No final response to this report is required. However, if you submit a response, it will be posted on the OIG's website, along with our memorandum commenting on your response. Your response should be provided as an Adobe PDF file that complies with the accessibility requirements of Section 508 of the Rehabilitation Act of 1973, as amended. The final response should not contain data that you do not want to be released to the public; if your response contains such data, you should identify the data for redaction or removal along with corresponding justification.

We will post this report to our website at www.epa.gov/oig.

Table of Contents

Purpose	1
Background	1
Responsible Office	3
Scope and Methodology	3
Results	4
Areas for Improvement	5
Recommendations	6
Agency Response and OIG Evaluation	6
Status of Recommendations and Potential Monetary Benefits	7

Appendices

A Agency Response	8
B Supplemental Agency Response	11
C Distribution	12

Purpose

The Office of Inspector General (OIG) is conducting an audit to determine how the Environmental Protection Agency’s (EPA’s) preparedness and response efforts for the three major hurricanes of calendar year 2017—Harvey, Irma and Maria—protected human health and water resources from storm-related drinking water and surface water contamination.

This report contains our findings and recommendations related to Hurricane Irma preparation and response efforts for water issues in EPA Region 4—Florida, in particular. Hurricane Irma also affected parts of Georgia, but Georgia did not request the EPA’s assistance with the state’s emergency response. Therefore, we did not include any information regarding Georgia’s emergency response activities.

On July 16, 2019, the OIG issued a report assessing EPA Region 6’s preparedness and response efforts pertaining to water issues associated with Hurricane Harvey.¹ The OIG will issue a subsequent report that will address EPA Region 2’s response relating to water issues during Hurricane Maria.

Background

Hurricane Irma made landfall in Florida on September 10, 2017, striking the Florida Keys and then moving north through the state and into Georgia. The National Hurricane Center rated the hurricane as a Category 4 storm, with wind speeds of 130 miles per hour when it reached Florida. In Irma’s wake, over half the state’s residents were without power, and the storm caused \$50 billion in damages to residential and commercial property.

In addition, the storm impacted approximately 85 percent of Florida’s drinking water and wastewater facilities. The large volume of rainwater from Hurricane Irma caused approximately 600 sewer overflows, which occur when wastewater treatment facilities release untreated stormwater and sewage into waterways, potentially exposing residents to harmful bacteria and pathogens. To protect human health, Florida drinking water systems issued 500 “boil water” notices after the hurricane. Residents who



Hurricane Irma left over half of Florida residents without power. (Florida Department of Environmental Protection photo)

¹ EPA Region 6 Quickly Assessed Water Infrastructure after Hurricane Harvey but Can Improve Emergency Outreach to Disadvantaged Communities, [19-P-0236](#), July 16, 2019.

followed these notices reduced their risk of exposure to pathogens that may have been present in their drinking water.

With few exceptions, the EPA responds to a federally declared disaster under the direction of the Federal Emergency Management Agency (FEMA). To facilitate an integrated federal approach to emergency response, all federal agencies adhere to the National Response Framework (NRF). The NRF includes 15 Emergency Support Functions (ESFs), which FEMA uses to coordinate the resources and capabilities most needed in a national response (Table 1). Under an ESF, FEMA issues mission assignments to federal agencies to direct the completion of specific tasks, such as the inspection of water utilities or cleanup of hazardous waste.

Table 1: National Response Framework ESFs

1	Transportation	9	Search and Rescue
2	Communications	10	Oil and Hazardous Materials
3	Public Works and Engineering*	11	Agriculture and Natural Resources
4	Firefighting	12	Energy
5	Information and Planning	13	Public Safety and Security
6	Mass Care, Emergency Assistance, Temporary Housing and Human Services	14	Superseded by the National Disaster Recovery Framework
7	Logistics	15	External Affairs/Standard Operating Procedures
8	Public Health and Medical Services		

** EPA-supported ESF in response to Hurricane Irma*

Source: OIG analysis of U.S. Department of Homeland Security data.

When federal agencies respond to a mission assignment, the FEMA-led National Incident Management System and Incident Command System detail how the federal government can implement the NRF in a unified manner. The National Incident Management System integrates existing best practices into a consistent nationwide approach to respond to domestic emergencies. The Incident Command System establishes a common organizational structure for managing resources, making decisions and assigning tasks. It also establishes a chain of command structure.

In response to the declaration of Hurricane Irma as a federal disaster, FEMA issued a mission assignment to the U.S. Army Corps of Engineers (USACE). In turn, on September 13, the USACE tasked the EPA under ESF #3—Public Works and Engineering (see Table 1). Region 4’s Water Protection Division activated its Water Emergency Response Team (WERT) to develop processes and procedures to rapidly review this critical infrastructure following a natural or manmade disaster.² Under ESF #3, the USACE is the lead agency while the EPA is the support agency in identifying critical drinking water and wastewater needs.

² As of April 2019, the Region 4 Water Protection Division is now the Region 4 Water Division. For purposes of clarity in this report, from this point on we will refer to this office as the Water Division.

Under the ESF #3 mission assignment, the region activated the Region 4 WERT to assess and report on the status of drinking and wastewater facilities, provide on-site technical assistance, and coordinate response efforts. The Region 4 Water Division deployed staff members in-place to a call center located in the regional office. The region deployed three staff members to the Tallahassee, Florida, emergency operations center. The Region 4 WERT, USACE and Florida Department of Environmental Protection (FDEP) staff worked together to assess the operational status of drinking water and wastewater facilities, designating each one as *Operational*, *Partially Operational*, *Non-Operational* or *Unknown*.

In total, Region 4 and USACE staff completed 2,227 assessments of drinking water and wastewater facilities. Region 4 staff deployed in Florida conducted eleven on-site assessments, and the balance were conducted by telephone. During the assessments, Region 4 staff also determined equipment needs and provided limited technical assistance to facilities.

Region 4 compiled daily reports on drinking water and wastewater facilities' status to FEMA, the USACE and the FDEP. The daily status updates were also used to brief Region 4 and EPA Headquarters management on the status of the agency's response to Hurricane Irma.

Responsible Office

EPA Region 4's Water Division is responsible for working closely with federal agencies, states, and local governments to respond quickly to water-related environmental concerns and natural disasters, including hurricanes.

Scope and Methodology

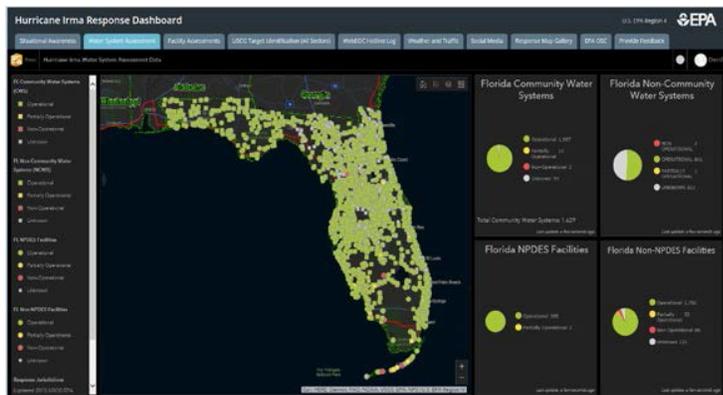
We conducted our work from May 2018 to August 2019. We conducted this performance audit in accordance with generally accepted government auditing standards. Those standards require that we plan and perform the audit to obtain sufficient, appropriate evidence to provide a reasonable basis for our findings and conclusions based on our audit objectives. We believe that the evidence obtained provides a reasonable basis for our findings and conclusions based on our audit objectives.

We reviewed FEMA's ESF #3 mission assignment for Region 4, hurricane response activity reports for Region 4, and documents about federal emergency response such as the NRF and ESFs. We interviewed Region 4 and FDEP staff who participated in the Irma response. We also conducted a site visit to Everglades City in Florida, one of the areas most impacted by Hurricane Irma.

Results

Region 4 completed its Hurricane Irma mission assignment within a 15-day period following the mission assignment. The state's drinking water and wastewater facilities returned to service within days or weeks after the hurricane, limiting the public's exposure to contaminated water. We identified two factors that enabled Region 4 to complete its ESF #3 mission assignment in Florida within 15 days:

1. *The region worked closely with the state.* Prior to the hurricane's landfall, Region 4's Water Division contacted the FDEP to inquire about whether the state needed resources from the EPA. The regional outreach set a tone of cooperation for the length of the response engagement by approaching the state staff as partners, rather than as regulators. In addition, three members of the WERT deployed under a USACE-led mission assignment to co-locate with the FDEP Drinking Water Program Administrator in Tallahassee and assisted the FDEP's newly appointed Drinking Water Program Administrator under ESF #3. The WERT assisted the FDEP to successfully conduct the state's response activities. One of the WERT members had years of experience in hurricane response in Florida and previously worked for the FDEP. This aided in creating good working relationships with state staff.
2. *The region created a supplemental database to track the status of drinking water and wastewater facilities.* EPA Region 4 used Florida's existing data system, Storm Tracker, to contact and document the operational status of drinking water and wastewater facilities. However, this system did not contain information for smaller non-community facilities, such as drinking water facilities at a school or truck stop. The region was concerned with facilities not listed in Storm Tracker. To supplement the information in Storm Tracker, the region created a dashboard (see image) showing all facilities that needed to be reviewed and their operational status tracked.



Sample screenshot of dashboard the Water Division used during Hurricane Irma Response. (EPA screenshot)

The creation of this supplemental listing of facilities, in conjunction with Storm Tracker, provided the region a more complete list of facilities. This enabled Region 4 staff to provide the FDEP and Region 4 senior management the real-time information needed to quickly determine the operational status of facilities and direct resources to those facilities most in need of assistance.

As the state and regional staff tracked facility status, Florida’s independent utility networks helped small drinking water and wastewater facilities quickly return to “operational” status. The Florida Water/Wastewater Agency Response Network

(FlaWARN) is a system of “utilities helping utilities” that offers response assistance during emergency situations.



An EPA response team meets for a safety briefing before assessing sites in Tampa, Florida. (EPA photo)

While Region 4’s mission assignment was limited to the review of water and wastewater facilities, FlaWARN helped facilities become operational by transporting generators, and providing support personnel and other resources. Additionally, the Florida Rural Water Association, an independent non-profit organization, helped smaller rural and remote facilities become operational. Together, the region, the state and the independent networks worked to bring facilities back online and resume operations quickly.

Areas for Improvement

While the Region 4 Water Division completed its mission assignment within a 15-day period, with additional training and proper guidance, Region 4 can improve water-related emergency response planning for possible future emergencies. Federal standards emphasize conducting planning activities to improve disaster response. For example, standard operating procedures can provide a central source of information on how disaster responses should proceed and conclude, and cross-governmental training exercises help federal agencies, states, and others to practice coordinating their response activities before disasters occur.

We identified two ways the Water Division can improve its emergency response preparation for possible future hurricane response activities:

1. Standard operating procedure: In 2010 the Region 4 Water Division developed a draft standard operating procedure that serves as a mechanism to train and deploy water sector personnel in response to state agencies’ requests for assistance when disasters occur. It was revised in 2012 to address issues of training and deployments, but it was neither finalized nor fully utilized.

Some staff reported that they were unfamiliar with the Water Division’s internal procedure for emergency response. In addition, a staff person reported that he or she was not aware of the requirements for deployment or the selection criteria for those who are deployed. A staff person

reported that a lack of training about the Incident Command System hampered overall effectiveness of the response. By finalizing the draft standard operating procedure, the Water Division can improve the information staff and management have for preparing for and responding to emergencies.

2. Training and exercises: Water Division staff said that they had not participated in any pre-storm simulations or exercises to prepare for potential emergency responses in preparation for Hurricane Irma. During our audit, in 2018, the Water Division held a training event with Region 4 states that focused on emergency response activities for the drinking water and wastewater sectors. Participants also included the USACE and FEMA. By conducting annual Water Division training on hurricane response, the region can improve its preparedness for an actual emergency response.

Recommendations

We recommend that the Regional Administrator, Region 4:

1. Direct the Water Division to finalize its standard operating procedure for disaster response.
2. Conduct annual hurricane emergency response exercises with federal and state partners.

Agency Response and OIG Evaluation

The Regional Administrator provided a response to this draft report addressing the two recommendations (Appendix A). The agency later supplemented its response with estimated completion dates for the corrective actions (Appendix B). Region 4 concurred with the two recommendations and implemented corrective actions for Recommendation 2 by beginning to conduct annual water sector hurricane emergency response coordination and training exercises with state and federal partners in 2018 and 2019. Therefore, the corrective actions for Recommendation 2 are completed upon issuance of the final report.

The planned corrective action for Recommendation 1 meets the intent of our recommendation. Region 4 Water Division plans to review, and update as needed, the division's standard operating procedure for water sector disaster responses. Recommendation 1 is resolved with the corrective action pending.

Status of Recommendations and Potential Monetary Benefits

RECOMMENDATIONS

Rec. No.	Page No.	Subject	Status ¹	Action Official	Planned Completion Date	Potential Monetary Benefits (in \$000s)
1	6	Direct the Water Division to finalize its standard operating procedure for disaster response.	R	Regional Administrator, Region 4	3/30/20	
2	6	Conduct annual hurricane emergency response exercises with federal and state partners.	C	Regional Administrator, Region 4	8/27/19	

¹ C = Corrective action completed.
R = Recommendation resolved with corrective action pending.
U = Recommendation unresolved with resolution efforts in progress.

Agency Response



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
 REGION 4
 ATLANTA FEDERAL CENTER
 61 FORSYTH STREET
 ATLANTA, GEORGIA 30303-8960

AUG 27 2019

MEMORANDUM

SUBJECT: EPA Region 4 Response to OIG Draft Report on the Region’s Water Emergency Response to Hurricane Irma
 OIG Project No. OPE-FY18-0005
FROM: Mary S. Walker, Regional Administrator
 Region 4
TO: Kathlene Butler, Director
 Water Directorate
 Office of Audit and Evaluation

Thank you for the opportunity to review the Office of Inspector General (OIG) draft report on the Environmental Protection Agency (EPA) Region 4’s response to Hurricane Irma in 2017. As noted in the draft report, the Florida Department of Environmental Protection (FDEP) Program Administrator stated “Without EPA’s ... assistance, we would not have gotten through it [Hurricane Irma] as easy...” Region 4 is proud of our work during this response and believe we successfully provided timely and substantial assistance to the requests of FDEP and our federal partners in support of the water sector Mission Assignment we received. We suggest that the title of the report be modified to reflect this success. We have included the following additional factual corrections. With these changes, we concur with the findings. We also include below our response to the draft recommendations.

Comments to the Report

p. 1 – In the “Purpose” section the report indicates that audit was conducted to look at preparedness and response to Hurricanes Harvey, Irma and Maria. The section further indicates how each hurricane except for Harvey is being addressed. For purposes of completeness, the report should include a discussion of how, or if, the OIG will evaluate the Agency’s response to Hurricane Harvey.

p. 2, 2nd paragraph below the Table 1 – The dates in the draft report indicate the Region 4 Water Emergency Response Team (WERT) activated on September 18th and remained active through September 27, 2017. Our records indicate that the WERT initiated activation on September 6, 2017. Attachment A to this memorandum is the email (September 6, 2017) documenting the call. In addition, we deployed three WERT members to Tallahassee from September 12 – 28, 2017. One Water Protection Division manager and two staff were deployed in response to an ESF-3 Mission Assignment from the USACE to

assist them and FDEP with the assessment of drinking water and wastewater infrastructure impacted by Hurricane Irma. On page 2, the draft report states “From September 18 to September 27, 2017, Region 4’s Water Protection Division activated... (WERT) to develop processes and procedures to rapidly review and repair this critical infrastructure...” This statement should be modified to clarify the earlier activation and deployments, as well as to clarify that the WERT assistance was for assessment not repair of infrastructure.

p. 3, first full paragraph – The draft report states “completed telephone and on-site water and....” This sentence should be clarified to indicate “on-site drinking water and” This paragraph also indicates that “Region 4 compiled Emergency Management Reports for internal use.” We believe a more accurate statement would be “In addition, Region 4 compiled a daily system status table for drinking water and wastewater facilities. This information was provided to USACE for their internal reporting and to FEMA (as lead for ESF #3), to FDEP, and was posted in the Region’s daily Situation Report which was used to brief Regional and EPA Headquarters management on the status of the Agency’s response to Hurricane Irma.”

p. 4, second paragraph in Factor 1 – The first sentence of this paragraph should be clarified to indicate that three members of the WERT deployed under an USACE ESF #3 mission assignment to co-locate with the FDEP Drinking Water Program Administrator in Tallahassee.

OIG Recommendations

1. Direct the Water Protection Division to finalize its standard operating procedure for disaster response.

The Region concurs with this recommendation. The Water Division (Note: The name of the division changed in the Region’s realignment and is now called “Water Division.”) is in the process of assessing the 2012 document called “Water Protection Division Emergency Response and Recovery Team (WPD-ERRT)” and updating the document to reflect current operational practices.

2. Conduct annual hurricane emergency response exercises with federal and state partners.

The Region concurs with this recommendation and has already implemented additional communication, training and response exercises with federal and state partners. In 2018, the Water Division hosted a disaster preparedness meeting in Florida in advance of Hurricane Season which was attended by most Region 4 states. EPA Region 4 OSCs as well as FEMA participated in the hurricane emergency response workshop. The Water Division also held a webinar in August 2019 with our state partners, in lieu of an in-person workshop, to once again prepare for the 2019 Hurricane Season. In this session, we reviewed how states can request federal assistance, outlined services the Region can provide and clarified water system status reporting expectations during declared disasters. Most recently, in July 2019, the region held Water Sector Emergency Response training to prepare our WERT to assist the states in the event of an ESF 3 mission assignment. We had 35 attendees. Lastly, the Water Division Director discussed Emergency Response during the EPA/State Water Directors’ Meeting as well as at State visits that are conducted yearly with each state. The same information as provided in the webinar was reiterated at this higher level.

The Water Division also participates in regional preparedness events and has been training new staff in incident command. For instance, WERT members participated in FEMA’s “Shaken Fury” earthquake response training exercise earlier this summer with participating state agencies. The Region is committed to continuing these coordination and training events for our own Regional staff, and with federal and state partners for the water sector.

Again, thank you for the opportunity to review and respond to the report. If you need additional information or have clarifying questions, please contact Jeaneanne M. Gettle, Director, Water Division at 404-562-8979 or gettle.jeaneanne@epa.gov.

Supplemental Agency Response

Agreements No.	Recommendation	High Level Intended Corrective Action	Estimated Completion
1.	Conduct annual hurricane emergency response exercises with federal and state partners.	EPA Region 4 will hold annual water sector hurricane emergency response coordination and training exercises with state and federal partners.	Region 4 recognized this as a need and began holding water sector hurricane emergency response coordination and training exercises with Region 4 coastal states in the summer of 2018. Another water sector hurricane response training and coordination event was held during the summer of 2019. The Region intends to continue these annually.
2.	Direct the Water Protection Division to finalize its standard operating procedure for disaster response.	EPA Region 4 Water Division will review, and update as needed, the Division's standard operating procedure for water sector disaster responses.	EPA Region 4 will finalize the Water Division's standard operating procedure document on or before March 30, 2020.

Distribution

The Administrator
Assistant Deputy Administrator
Associate Deputy Administrator
Chief of Staff
Deputy Chief of Staff
Assistant Administrator for Water
Regional Administrator, Region 4
Agency Follow-Up Official (the CFO)
Agency Follow-Up Coordinator
General Counsel
Associate Administrator for Congressional and Intergovernmental Relations
Associate Administrator for Public Affairs
Deputy Assistant Administrator for Water
Principal Deputy Assistant Administrator for Water
Deputy Regional Administrator, Region 4
Director, Superfund and Emergency Management Division, Region 4
Director, Water Division, Region 4
Director, Office of Continuous Improvement, Office of the Administrator
Audit Follow-Up Coordinator, Office of the Administrator
Audit Follow-Up Coordinator, Office of Water
Audit Follow-Up Coordinator, Region 4