Analytical Preparedness Full-Scale Exercise Toolkit

U.S EPA–Water Laboratory Alliance| May 2018

EPA

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Outline

Introduction

Demonstration of the AP-FSE Toolkit

Rollout of the AP-FSE Toolkit


INTRODUCTION

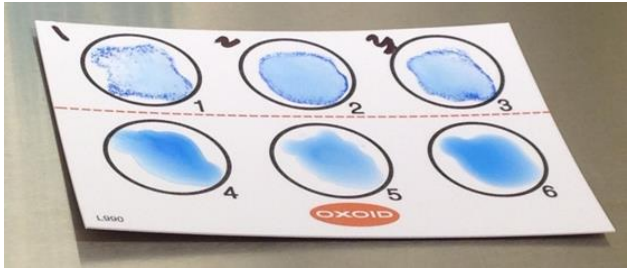
What is a Full-Scale Exercise (FSE)?

Definition: ***An operations-based exercise in which live actions are taken in response to a fictional scenario***

- Typically involves coordination by multiple organizations, over the course of multiple days
- Intended to mirror a real incident
- At least some actions are performed live, others may be notional
- Enables participants to practice coordination and response

What is an Analytical Preparedness Full-Scale Exercise (AP-FSE)?

- Participants: water utility, multiple laboratories, possibly other response partners
- Length: 3-5 days
- Scenario: early phase of an emergency involving water contamination
- Laboratory analyses performed in real time



- Goals for participants:
  - Identify improvements to internal standard operating procedures (SOPs)
  - Build relationships for effective emergency response
  - Increase familiarity with WLA Response Plan best practices and other response procedures

AP-FSE Pilot Exercises

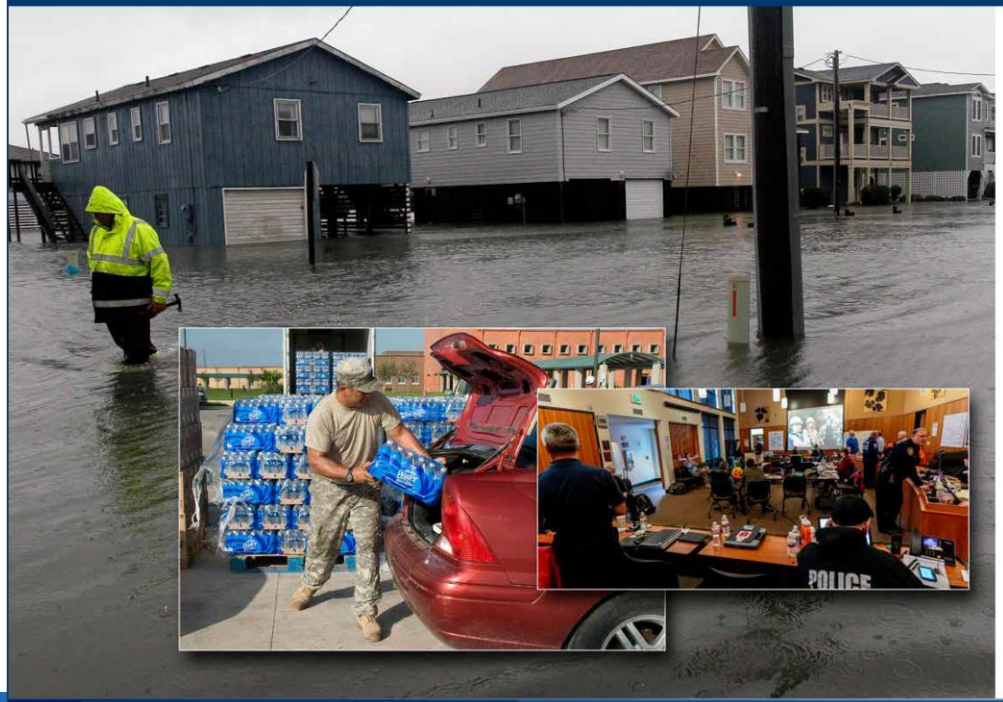
- As of May 2018, five pilot exercises have been conducted using both chemical and biological scenarios
- EPA Regions 2, 3, and 9 (NY, VA, and AZ)
- Drinking water and wastewater utilities
- Performance data collected for two EPA methods

The AP-FSE Toolkit

DIY guide that water utilities can use to develop and lead their own AP-FSE

- Includes complete documentation for two sample scenarios (chemical, biological threat)
- Includes customizable forms, checklists, etc.
- Flexible and scalable
- Consistent with the Homeland Security Exercise & Evaluation Program
- Refined based on pilot AP-FSEs
- EPA may provide technical assistance (as resources permit)

AP-FSE TOOLKIT DEMONSTRATION



Welcome and Overview

What is the Analytical Preparedness Full-Scale Exercise (AP-FSE) Toolkit?

The AP-FSE Toolkit is an interactive resource that provides the necessary information and guidance for utilities and other organizations to plan and conduct their own AP-FSE for a water contamination scenario that requires analytical (i.e., laboratory) support. The AP-FSE Toolkit provides examples and templates that organizations can use to develop all the necessary documentation to support the exercise.

Exercise participants may include water utilities, laboratories and other Response Partners including local, state and federal environmental, public health, and emergency response agencies. Exercise participants include exercise planners, managers and Players. Exercise participants are discussed in greater detail in Step 2 of this document. For a summary of the exercise participant roles and responsibilities click here.

The Exercise Planning Team can either adopt the existing examples or alter the materials to create new scenarios and supporting documentation that meet their needs. The AP-FSE Toolkit is intended to be consistent with the Department of Homeland Security's Homeland Security and Exercise Evaluation Program (HSEEP) guidelines. More information can be found on the Federal Emergency Management Agency's HSEEP website.

Training on how to use the AP-FSE Toolkit *(coming soon)* to plan and conduct an exercise is available.

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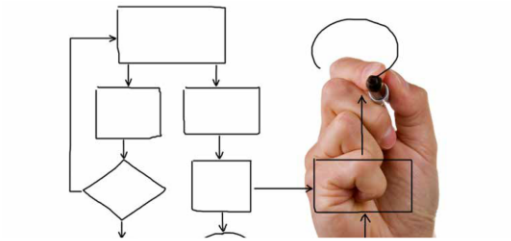
Introduction: 10-Step Process for Planning and Conducting an AP-FSE

Process

There are 10 steps to developing, conducting and evaluating AP-FSEs, as listed on the right. Before planning your exercise, please read through all 10 steps in the process. It is critical to be aware of activities and resources in each section before designing and conducting your exercise. To access the glossary and find definitions of acronyms, click the "Glossary" button located at the top of each page.

Generally, 6 to 12 months should be allowed for planning an AP-FSE depending on the complexity of the exercise. Allowing sufficient time for planning is necessary to account for time required to recruit exercise participants, develop and review exercise documentation, and obtain the necessary laboratory supplies for sample analyses. An example planning schedule is provided in Step 5.1.



Homeland Security Exercise and Evaluation Program (HSEEP)		10-Step Process
Exercise Evaluation	Exercise Design and Development	1. Initiate the Exercise Planning Process
		2. Identify and Recruit Potential Participants
		3. Identify Objectives
		4. Develop the Scenario and Expected Actions
		5. Schedule the Exercise
		6. Prepare Exercise Documents
	Exercise Conduct	7. Conduct Pre-Exercise Training Sessions, Briefings and Laboratory Practice
		8. Conduct the Exercise
		9. Conduct the Hot Wash
	Improvement Planning	10. Perform Exercise Follow-Up Activities

Step 1: Initiate the Exercise Planning Process

1.1 Lead Organization

For exercise planning to begin, there must be an organization that will lead the planning process and ensure there is sufficient funding to conduct the exercise. Potential lead organizations may include, but are not limited to, the following:

- Drinking water utilities.
- EPA Regions.
- State environmental or public health laboratories.
- State drinking water agencies.
- State or local emergency management agencies.
- Water associations.

While one organization will serve as the lead during the planning process, representatives from each participating organization should be included in the Exercise Planning Team. For more information on the Exercise Planning Team, see Step 2.1.1.

1.2 Kickoff Activities

AP-FSE kickoff activities can begin once a lead organization has been identified. Before beginning to plan for the exercise, the lead organization should take the following steps:

- Notify EPA to express interest in conducting an AP-FSE and request EPA support (see Step 1.3 on the following page).
- Take the EPA-provided training on the AP-FSE Toolkit *(coming soon)*.
- Review the Water Laboratory Alliance Response Plan (WLA-RP).
- Take the WLA-RP Training via online module.

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Step 2: Identify and Recruit Potential Participants

2.1 Exercise Participants

Exercise participants include the exercise planners and managers (including Exercise Planning Team members and Controllers) as well as the exercise Evaluators, Players and Observers. Each exercise participant has a critical role to play in the success of the exercise. The activities conducted by the Players will depend on the goals and objectives of the exercise.
Click here for a summary of exercise participant roles and responsibilities.

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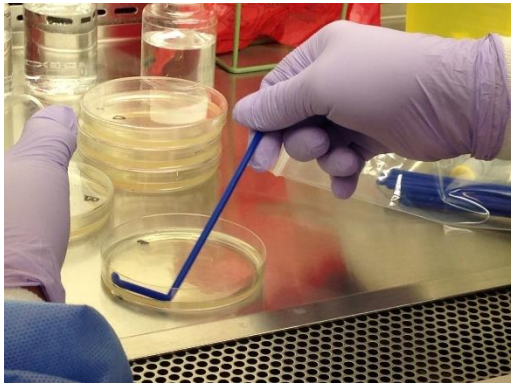
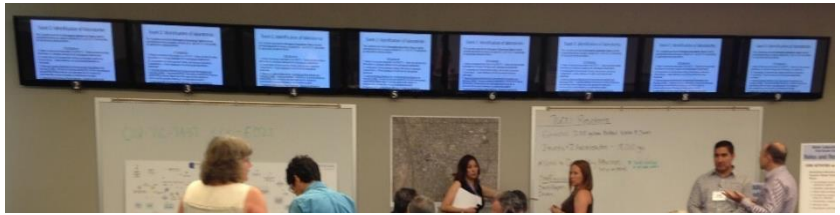
Exercise Planning Team, Controllers and Evaluators

Role	Responsibilities
Exercise Planning Team	• Oversees the successful execution of all aspects of an exercise. • Schedules and participates in exercise development meetings. • Develops exercise objectives and exercise scenario(s). • Prepares and distributes AP-FSE documents. • Coordinates recruitment of AP-FSE Players. • Conducts AP-FSE pre-exercise briefing and training sessions. • Coordinates and conducts AP-FSE Hot Wash. • Prepares AP-FSE After-Action Report (AAR).
Controllers	• Help plan and manage AP-FSE play. • Simulate roles of individuals and agencies not participating in the AP-FSE. • Provide key data to Players. • Prompt or initiate certain Player actions to ensure AP-FSE continuity.
Evaluators	• Record events that take place in their evaluation location. • Evaluate the Player's activities using Exercise Evaluation Guides (EEGs).

Recruiting Players and other Participants

Participants	Information to Provide During Initial Recruitment
All Participants	• The purpose of the AP-FSE. • Their role in the AP-FSE, including the anticipated level of effort. • How participation will benefit their organization. • Anticipated date of the exercise. • High-level summary of the scenario.
Analytical Services Requester (Utility or other Response Partner)	• The number of laboratories the ASR will coordinate. • The contaminants that will be involved. • The methods that will be used. • How data will be reported.
Laboratories	• The contaminants that will be involved (unless the scenario is for an unknown contaminant). • The methods that will be used (unless the scenario is for an unknown contaminant). • Number of samples to be analyzed. • Any required practice analyses. • The method of data reporting. • Any anticipated compensation for participation.





Step 3: Identify Objectives

3.1 Developing Exercise Objectives

One of the first tasks for the Exercise Planning Team is to develop exercise objectives. Objectives are distinct outcomes that the participating organizations wish to achieve through conducting the exercise. The exercise objectives should represent the interests of all the organizations participating in the exercise. The Exercise Planning Team should use the exercise objectives to drive development of the remainder of the exercise documentation. When the exercise is complete, the exercise outcomes will be evaluated against the exercise objectives to determine if the objectives were achieved or if corrective actions need to be implemented to address any gaps in preparedness. Exercise objectives could incorporate any of the following:

- Evaluation and testing of plans, processes and procedures.
- Identification of gaps in resources necessary for effective response to water contamination events.
- Development of relationships between utilities, laboratories and other Response Partners.
- Evaluation of analytical methods for use during water contamination incidents.

Note: These exercises are designed to be conducted in a no-fault atmosphere that focuses on making improvements to plans and procedures, rather than finding fault with specific individuals or organizations.

3.2 Examples of Exercise Objectives

A list of objectives used for previous exercises is provided below:

- Practice the procedures of the EPA Water Laboratory Alliance Response Plan (WLA-RP).
- Practice coordination of analytical support for a water contamination incident between drinking water utilities and analytical laboratories.
- Practice and evaluate internal standard operating procedures (SOPs) of exercise Players.
- Build relationships between utilities, laboratories and other Response Partners to facilitate coordination of analytical support to a water contamination incident.
- Build proficiency using the newly optimized methods for chemical and biological contaminants.
- Evaluate the use of EPA's Web-based Electronic Data Review (WebEDR) application for chemical data.
- Evaluate the effectiveness of National Incident Management System (NIMS) training.
- Evaluate use of the Emergency Operations Plan (EOP) or Continuity of Operations Plan (COOP).

Issue identification is not as valuable as suggestions and recommended actions that could improve response efforts. Problem-solving efforts should be the focus.

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Step 4: Develop the Scenario and Expected Actions

4.1 Scenario Development

The exercise scenario should be designed to support exercise participants in meeting the stated exercise objectives. Ideally, the exercise scenario is developed early in the exercise planning process. Scenarios generally start with a trigger event that indicates there is an actual or potential drinking water contamination incident. Potential trigger events could include natural disasters, terrorist threats, chemical spills, industrial accidents, customer complaints or illnesses. When developing a scenario, consider the following:

- What are the potential threats to the utility's drinking water system (e.g., likelihood of natural disasters, susceptibility to intentional contamination)?
- What are likely contaminants for the drinking water utility based on historical data, water source and proximity to industry or chemical storage facilities?
- What part of the response will the exercise cover (e.g., contaminant identification, determining extent of contamination, assessing the effectiveness of decontamination, whether it is safe to return to service)? Due to time constraints, it may not be possible to play out the analytical support needed for all phases of the response during one exercise.
- Does the scenario present opportunities to evaluate, test or practice all procedures and plans included in the exercise objectives?
- Are any components of the scenario cost prohibitive?

Scenarios should be realistic to the furthest extent possible. When selecting a contaminant, consider the contaminant's properties. Some properties to consider when designing the scenario are provided below. Additional information can be found using the Water Contaminant Information Tool (WCIT).

Contaminant Properties

- Is it soluble?
- Will it break down quickly?
- Is it impacted by water treatment?
- How toxic is it?
- What are the symptoms of people exposed to the contaminant?
- How long does it take after exposure for the onset of symptoms to occur?
- Does it have a taste or odor likely to be detected by customers?

Two example scenarios are provided. These scenarios can be used as is or may be modified as needed to achieve the exercise objectives.

Chemical Scenario Example

Contamination of drinking water with a pesticide (dicrotophos) from an unknown source.

DOWNLOAD EXAMPLE

Biological Scenario Example

Contamination of drinking water with *E. coli* O157:H7 after heavy rainfalls cause runoff from agricultural areas.

DOWNLOAD EXAMPLE

These scenarios are based on the assumption that these incidents involve a small, localized response and that the impacted drinking water utility coordinates all laboratory support. Modifications will need to be made for larger incidents or if an organization other than the drinking water utility is responsible for coordinating laboratory activities.

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Step 5: Schedule the Exercise

5.1 Activities to Complete

Exercise planning may take 6 months to a year, depending on the complexity of the exercise. A list of major exercise planning steps and the recommended minimum amount of time they should be completed prior to the exercise is provided in Table 5.1. The exercise planning schedule should be developed early in the planning process. Updates should be made and new schedules distributed as needed.

Table 5.1 Recommended Schedule for Exercise Activities

Activity	Time Frame in Relation to Exercise
Initial Planning Meeting/Exercise Kickoff	6 months prior
Develop Exercise Objectives and Scenario	5 to 6 months prior
Recruit Exercise Participants	5 to 6 months prior
Schedule Exercise Date	4 months prior
Draft Exercise Documentation (Master Scenario Events Lists [MSELs], Exercise Evaluation Guides [EEGs], etc.)	2 to 3 months prior
Midterm Planning Meeting	Halfway through planning time
Order Supplies and Reagents for Laboratories (if needed)	3 months prior
Conduct Practice Analyses (if needed)	1 month prior
Complete Exercise Documentation (MSELs, EEGs, etc.)	1 month prior
Conduct Evaluator Training	1 month prior
Conduct Controller Training	1 month prior
Conduct Player Briefing	1 month prior
Final Planning Meeting	2 weeks prior
Prepare Exercise Samples	1 week prior
CONDUCT EXERCISE	**N/A**
Conduct Exercise Hot Wash	Immediately following
Prepare After-Action Report (AAR)	Within 3 months
Conduct Improvement Planning Meeting	Within 6 months

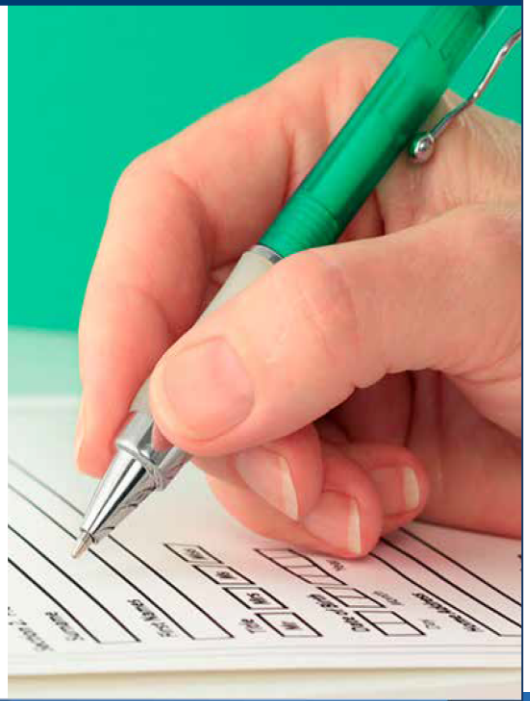
Step 6: Prepare Exercise Documents

6.1 Documentation List

A list of major exercise documents developed by the Exercise Planning Team and a brief description of each document is provided in Table 6.1. These documents should be finalized several weeks prior to the start of the exercise.

Table 6.1 Exercise Documents

Exercise Document	Description
Master Scenario Events List (MSEL)	A chronological listing of the events that drive exercise play. The MSEL contains background incident information, notional steps, exercise implementation coordination steps and injects that initiate activities by exercise Players.
Exercise Evaluation Guide (EEG)	The EEG identifies the activities the Evaluator should be observing and provides a consistent format for recording exercise tasks. Steps in the EEG correspond with steps in the MSEL.
Organization Evaluation Form	The Organization Evaluation Form provides participants within each organization with the opportunity to provide input on the observed strengths and opportunities for improvement identified during the exercise.
Participant Feedback Form	The Participant Feedback Form provides Players, Evaluators and Observers with the opportunity to provide feedback about the design, control or logistics of the exercise to help enhance future exercises.



Step 7: Conduct Pre-Exercise Training Sessions, Briefings and Laboratory Practice

7.1 Tool Training

EPA Water Security tools are often used by the Exercise Planning Team to develop the exercise and by Players during the exercise to aid their response activities. A list of tools commonly used to plan, prepare and conduct AP-FSEs are provided in Table 7.1 (see the following page). To prepare for the use of these tools, multiple personnel from each organization playing in the exercise should complete the following activities prior to the start of the exercise:

- Register to receive passwords and user names, if the tools have restricted access.
- Log in to each tool and become familiar with its use.
- Receive formal training on the use of the tool, if available.

In some cases, the EPA WLA Team may be able to provide tool training. Contact the WLA at WLA@epa.gov to find out about training availability.

Step 8: Conduct the Exercise

8.1 Pre-Exercise Activities

There are several activities that need to take place in the month prior to the exercise. These activities are listed in Table 8.1. The Exercise Incident Command (IC) Supply List provides a checklist of items that should be available in the IC location during the exercise.

Table 8.1 Pre-Exercise Activities

Activity	Description
Training Sessions	Confirm that exercise Players have completed any required training sessions
Player Briefings	Confirm that Player briefings are complete and any remaining questions from exercise Players have been answered
Laboratory Practice Analyses	Complete laboratory practice analyses 2 to 3 weeks prior to the start of the exercise and review the laboratory data
Prepare Exercise Samples	Exercise samples prepared by a third party should be prepared prior to the start of the exercise. Sample holding times should be considered when determining how far in advance to prepare the exercise samples.
Ship Exercise Samples	Exercise planners may wish to have exercise samples shipped to laboratories in advance of the exercise to avoid any delays due to shipping problems. Laboratories can hold these samples until the exercise starts.

8.2 Exercise Kickoff

The exercise kickoff should start with a briefing of the Players to provide information on background scenario and any notional activities that have already occurred to set up the start of the exercise. The Players included in this initial briefing may vary depending upon the exercise scenario but usually include the utility impacted by the incident and any Response Partners involved in the initial response. The laboratories may be included in this initial briefing or may receive background information on the incident later, as part of the exercise play. The briefing is typically provided by one of the exercise Controllers verbally and in writing.

Step 9: Conduct the Hot Wash

9.1 Hot Wash

The Hot Wash should be conducted as soon as practical after the completion of the exercise, and invitations should be sent out prior to the start of the exercise. The Hot Wash can occur in person, via conference call, or via webcast and may last 2 to 3 hours, depending on the complexity of the exercise and the number of exercise participants. Ideally, the Hot Wash should be led by a member of the Exercise Planning Team or an Exercise Controller with exercise facilitation experience. Each organization that participated in the exercise should have an opportunity to present its observations. Topics to be discussed during the Hot Wash include:

- Issues encountered including gaps in resources, problems with method performance, etc.
- Strengths identified.
- Preliminary recommendations to improve preparedness.
- Recommendations to improve the exercise.
- Submission deadline for Exercise Evaluation Guides (EEGs), Participant Evaluation Forms and Participant Feedback Forms (generally 2 to 3 weeks).
- Process for development of the After-Action Report (AAR).

Outstanding questions can also be answered during the Hot Wash. The information provided during the Hot Wash should be captured and used to support the development of the After-Action Report (AAR).

At the beginning of the Hot Wash, be sure to stress that these exercises are designed to be conducted in a **no-fault atmosphere** that focuses on making improvements to plans and procedures, rather than finding fault with specific individuals or organizations. This should be emphasized during the Hot Wash and reflected in the findings of the AAR.

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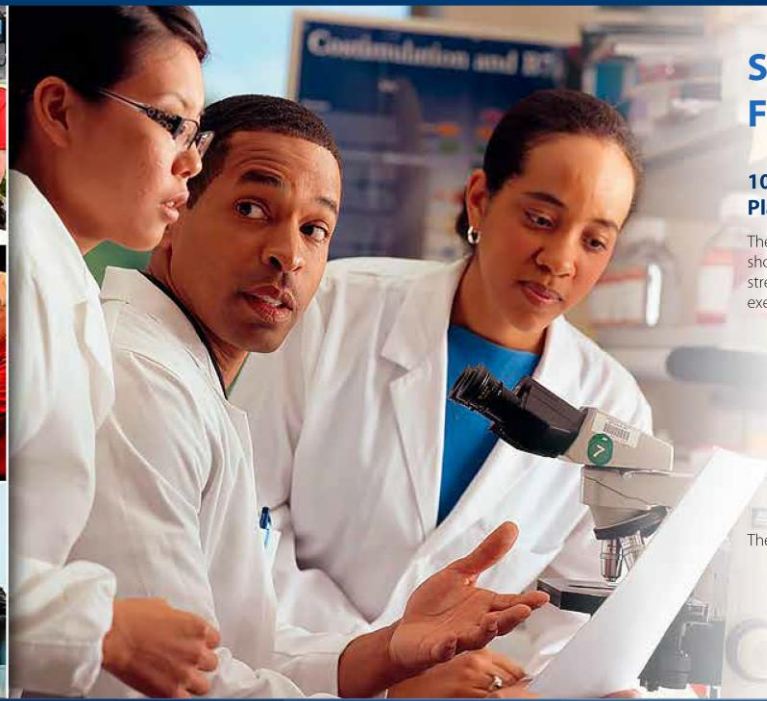


Step 10: Perform Exercise Follow-Up Activities

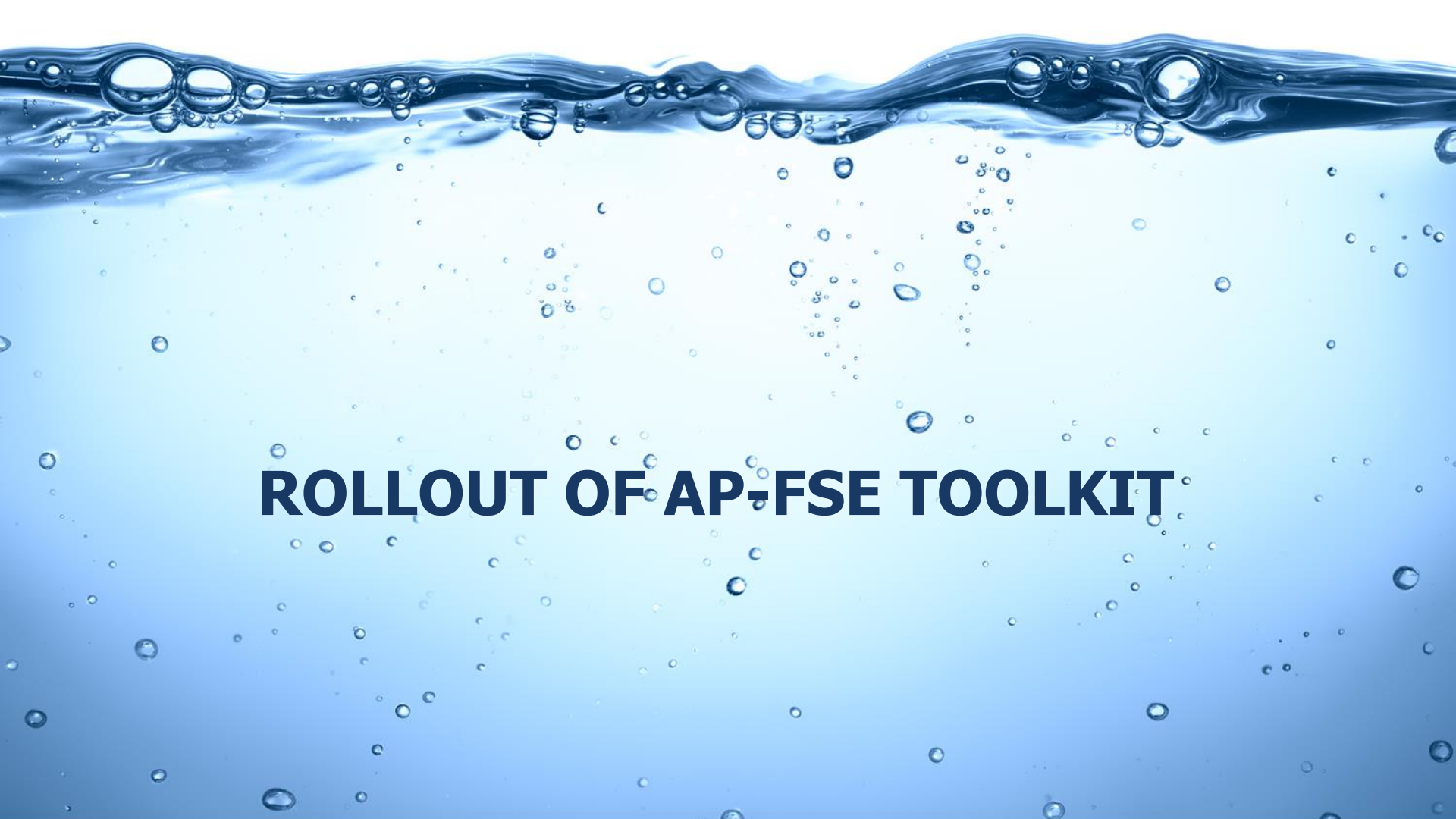
10.1 After-Action Report (AAR) and Improvement Plan (IP)

The AAR is developed by members of the Exercise Planning Team and should provide an overview of exercise objectives, while highlighting strengths and areas for improvement. Generally, AARs also include basic exercise information, such as:

- Exercise name.
- Exercise type.
- Dates.
- Location.
- Participating organizations.
- Specific threat or hazard.
- A brief scenario description.
- Name of the AP-FSE lead organization and point of contact (POC).

The AAR should be based on the following information sources:

- Exercise Evaluation Guides (EEGs).
- Participant Evaluation Forms.
- Feedback Forms.
- Exercise Debriefs.
- Exercise Hot Wash.


ROLLOUT OF AP-FSE TOOLKIT

Current Status and Next Steps

- Currently in "beta"
  - Has been updated based on experience in pilots and expert review
- Anticipated publication on EPA website: Spring 2018
- EPA's Water Security Division is seeking two utilities to lead AP-FSEs using the Toolkit in 2018, involving:
  - Biological contamination scenario
  - Experimental PCR method

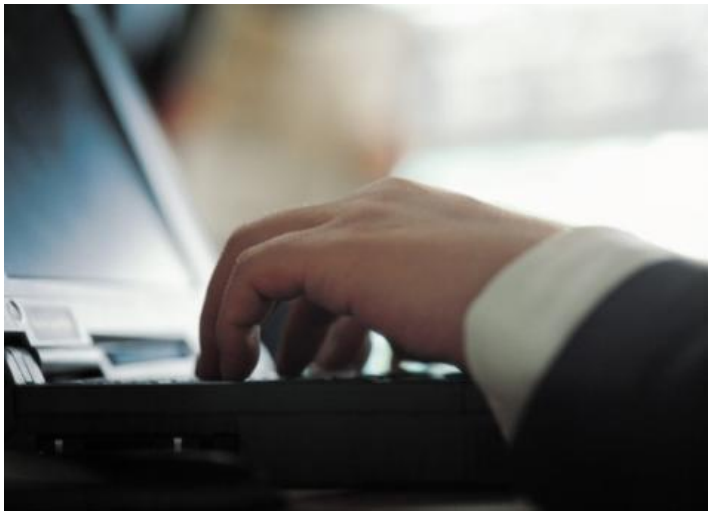
Questions?

For more information on the Water Laboratory Alliance or the AP-FSE Toolkit, please contact:

WLA Team
Email: WLA@epa.gov
ERLN/WLA Helpline: (703) 461-2400

Latisha Mapp, WLA Team Leader
mapp.latisha@epa.gov
202-564-1390

George Gardenier, Chemist
gardenier.george@epa.gov
202-564-3333



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