emwd EASTERN MUNICIPAL WATER DISTRICT

Hazard Mitigation Plan

2017-2023

Eastern Municipal Water District
2270 Trumble Road
P.O. Box 8300
Perris, CA 92572-8300

Revision Date:
July 2023

EXECUTIVE SUMMARY

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1. PLAN REQUIREMENTS AND OBJECTIVES

The Eastern Municipal Water District (EMWD) Hazard Mitigation Plan is a living document that reflects ongoing hazard mitigation activities. Hazard mitigation involves strategies to reduce short and long-term vulnerability to identified hazards. This document serves as the framework for the ongoing identification and implementation of hazard mitigation strategies developed for EMWD Service Area.

EMWD adopted its previous Hazard Mitigation Plan in 2017. This document serves as an update to that Plan.

BACKGROUND INFORMATION

In 2000, the United States Congress determined that disasters and, more importantly, lack of preparedness for disasters, were significant causes of loss of life, human suffering, loss of income, and property damage. Furthermore, because disasters often disrupt the normal functioning of governments and communities and adversely affect individuals and families with great severity, special measures designed to assist the efforts of the affected States in expediting the rendering of aid, assistance, and emergency services, and the reconstruction and rehabilitation of devastated areas, were necessary. As a result, Congress passed the Disaster Mitigation Act of 2000 (DMA 2000), or Public Law 106-390, to amend the Robert T. Stafford Disaster Relief and Emergency Assistance Act. This provides an opportunity for States, Tribal governments, and local jurisdictions to apply for assistance from the Federal government in carrying out their responsibilities to alleviate the suffering and damage which results from such disasters by:

a. revising and broadening the scope of existing disaster relief programs
b. encouraging the development of comprehensive disaster preparedness and assistance plans, programs, capabilities, and organizations by the States, local governments, and special districts
c. achieving greater coordination and responsiveness of disaster preparedness and relief programs
d. encouraging hazard mitigation measures to reduce losses from disasters, including development of land use and construction regulations and
e. providing Federal assistance programs for both public and private losses sustained in disasters.

DMA 2000 allows State, Tribal, and local jurisdictions to obtain Federal assistance through pre-disaster hazard mitigation planning. As part of the requirements for receiving Federal grants for improving a locality's resistance to disasters, each locality must determine their existing vulnerabilities and develop a plan to reduce or eliminate these vulnerabilities and must have this plan approved by the appropriate State and Federal officials. Upon approval of this plan, each locality is eligible to receive various types of disaster-related assistance through the Federal Emergency Management Agency's (FEMA) Hazard Mitigation Assistance (HMA) Program. This includes the Pre-Disaster Mitigation (PDM) program and Hazard Mitigation Grant Program (HMGP) which releases grant funds before and after a hazard event as well as the Flood Mitigation Assistance Grant (FMA) Program which appropriates funds for projects and planning that will reduce long-term risk of flood damage to structures insured under the National Flood Insurance Program (NFIP). Although EMWD is not the NFIP Flood Plain Manager, District personnel can work with local Flood Plain Managers/cities to improve flood control.

The PDM program provides funds for hazard mitigation planning and the implementation of mitigation actions prior to a disaster event. These grants are funded and approved through FEMA on a competitive basis. The HMGP provides grants to implement long-term hazard mitigation measures after a major disaster declaration. These grants are funded by FEMA but are distributed by the State. In California, that agency is the Governor's Office of Emergency Services (Cal OES).

FEMA has developed guidance to assist communities in developing both the vulnerability assessments and plans to reduce or eliminate their vulnerabilities to disasters. These tools, coupled with techniques from the safety and security industries were used to update EMWD's Hazard Mitigation Plan. Additional information regarding the HMGP and PDM programs can be found in FEMA's "Hazard Mitigation Assistance Unified Guidance" document, located in FEMA's Hazard Mitigation Assistance portal (http://www.fema.gov/hazard-mitigation-assistance). Additional information including guidance and regulations can be found at the Cal OES's Local Hazard Mitigation Planning Program portal:
(http://hazardmitigation.calema.ca.gov/plan/local_hazard_mitigation_plan_lhmp).

To be eligible for certain Federal disaster assistance and mitigation funding, EMWD is required to have a Cal OES- and FEMA-approved Hazard Mitigation Plan in place. As a result, EMWD began an effort to update this document to fulfill Cal OES and FEMA requirements and provide direction and guidance on implementing hazard mitigation actions on a hazard-level, probability, and cost-priority basis. The overall goal of the Hazard Mitigation Plan is to reduce the potential for damage to critical assets from natural and man-made hazards. In addition, the plan describes past and current hazard mitigation activities and philosophies and outlines future mitigation goals and strategies.

FEMA REQUIREMENTS

FEMA requires that the Hazard Mitigation Plan meet certain requirements. First, the planning process must be open and public, and must allow the public to have an opportunity to comment during the drafting stage and prior to plan approval. Second, the process must allow other local jurisdictions to be involved in the planning process. Third, the Plan must incorporate, if appropriate, existing plans, studies, reports, and technical information.

FEMA expects that each Hazard Mitigation Plan have the following information:

1. Documentation of the ***planning process*** used to develop the plan
2. A ***risk assessment*** that provides a factual basis for upgrades and recommendations
3. A ***description of the natural hazards*** that can affect the jurisdiction
4. A ***description of the jurisdiction's vulnerability*** to these hazards
5. A ***description of land usage,*** and an ***estimate of losses*** should a disaster occur
6. A ***mitigation strategy***
7. A plan ***maintenance process***
8. ***Documentation*** that the plan has been adopted by the jurisdiction's governing body
9. ***Review*** by the State Hazard Mitigation Officer

2. MITIGATION DEFINITION

Mitigation is the ongoing effort to prevent or lessen future emergency or disaster incidents, and the impacts they might have on people, property, and the environment. Examples of mitigation activities include the following:

- Policies and procedures
- Variances
- Engineering and building policies
- Hazard mitigation plans & teams
- Technical guidance & assistance
- Financial assistance
- Hazard Identification
- Risk Analysis
- Evaluation
- Research
- Education

Mitigation decreases the demand for emergency response resources, reduces the principal causes of injuries and deaths, enables a quicker lifesaving response and economic recovery because the community infrastructure remains intact, and reduces the societal impacts of the emergency because it results in less disruption to the social environment. In essence, mitigation is the foundation of sustainable community development.

3. PLANNING PROCESS SUMMARY

Hazard mitigation planning is a dynamic process built on realistic assessments of past and present information that enables District personnel to anticipate future hazards and provide mitigation strategies to address possible impacts and identified needs. The overall approach to the Hazard Mitigation Plan included developing a baseline understanding of natural and man-made hazards, determining ways to reduce those risks, and prioritizing mitigation recommendations for implementation.

To complete these objectives, District staff compiled a qualified team with various expertise, including Engineering, Safety; Risk and Emergency Management, Operations and Maintenance, Local City Personnel, and Riverside County representatives to participate on a Taskforce to guide the update of EMWD comprehensive Hazard Mitigation Plan. In addition, the Taskforce solicited public involvement throughout the planning process, including the release of a public survey through EMWD website, allowing the public to comment during the drafting stage, and making the draft Plan available to allow the public to comment on its content. Chapter 1: Planning Process contains descriptions of the Planning process, including information on the Taskforce and public involvement.

4. HAZARD ANALYSIS

EMWD Service Area is vulnerable to a wide range of natural and man-made hazards that threaten life and property. To identify the hazards that EMWD perceives as the largest threat, each member of the Taskforce participated in the Hazard Identification Workshop during the first Taskforce Meeting. The Taskforce brainstormed potential hazards based on past incidents that have impacted the Service Area and information incorporated from other studies. Each identified hazard was then qualitatively ranked based upon hazard probability/frequency, consequence/severity, and EMWD overall vulnerability using an interactive model. Section 3.2 Hazard Identification, contains detailed information regarding the hazard ranking. Table ES.1 provides a summary of the hazard ranking.

TABLE 1: EMWD HAZARD RANKING SUMMARY

Hazard Rank
High
Earthquake
Moderately High
Extreme Weather
Flood & Dam/Reservoir Failure
Infrastructure Failure
Wildfire
Hazardous Materials Release
Terrorism
Moderate
Power Failure
Moderately Low
Drought
Low

ASSET INVENTORY AND LOSS ESTIMATES

In addition to the hazard profiles, the Risk Assessment contains a detailed asset inventory that lists EMWD's assets, such as operations facilities, administration buildings, and pipelines. This asset inventory was used in the vulnerability assessment to estimate potential losses for each hazard. The Taskforce reviewed each hazard and assigned a potential percentage of damage expected. This also included loss of function values for water service. Section 3.14 Loss Estimates, includes a detailed breakdown of the vulnerability assessment calculations.

TABLE 2: LOSS ESTIMATE SUMMARY

	Estimated Losses
Earthquake	$642,214,242.4
Terrorism	$215,959,457
Hazardous Material Release	$167,749,814
Infrastructure Failure	$129,759,550
Flood/Dam Release	$113,214,882
Wildfire	$24,248,507
Power Failure	$22,824,145
Extreme Weather	$12,684,940
Drought	$4,975,895

Note: A total value is not included since it is not expected for all hazards to occur simultaneously.
Note: Values are rounded to the nearest thousand.

5. MITIGATION STRATEGIES AND IMPLEMENTATION PLAN

PLAN GOALS AND OBJECTIVES

As part of the development process, Plan goals and objectives were revalidated to provide a framework for mitigating hazards and proposing potential mitigation actions. The goals were developed by the Steering Committee and are consistent with the California State Hazard Mitigation Plan and the Riverside County Multi-Jurisdictional Local Hazard Mitigation Plans. EMWD overall Plan goals are to:

- Save Lives and Reduce Injuries
- Avoid Damages to Property
- Protect the Environment
- Promote Hazard Mitigation as an Integrated Policy

In addition to the plan's goals, individual objectives were developed which support the overall Plan goals and translate more easily into mitigation actions. Section 4.1 Mitigation Goals and Objectives contains the full list of the Plan goals and objectives.

MITIGATION STRATEGIES

Mitigation strategies are administrative and/or engineering project recommendations to reduce the vulnerability to the identified hazards. The Steering Committee identified specific mitigation actions to reduce the impact or likelihood of the hazards that reflected the Plan goals and objectives.

IMPLEMENTATION PLAN

Following the identification of mitigation actions, a simplified Benefit-Cost Review was applied to prioritize the mitigation actions for implementation. The priority for implementing mitigation actions depended upon the overall cost effectiveness of the action, when considering monetary and non-monetary costs and benefits associated with each action. Additionally, the following questions were considered when developing the Benefit-Cost Review:

- How many people will benefit from the action?
- How large of an area is impacted?
- How critical are the assets that benefit from the action?
- Environmentally, does it make sense?

The Benefit-Cost Review yielded a relative priority ranking (High, Medium, or Low) for each mitigation action. Each ranking is defined as follows.

- High: Benefits are perceived to exceed costs without further study or evaluations; or the action is critical.
- Medium: Benefits are perceived to exceed costs but may require further study or evaluation prior to implementation.
- Low: Benefits and costs require evaluation prior to implementation.

Mitigation actions identified as high priority are typically implemented before lower ranked actions. Results from the Benefit-Cost Review are in Chapter 4.4 Prioritization of Mitigation Recommendations. The Steering Committee considered responsible departments, funding resources, and estimated implementation timeframe when developing the implementation plan.

Chapter 4 Mitigation Strategies contains additional information regarding the mitigation strategies and implementation plan. Table 3 on the following pages provides a summary of each mitigation action, including the hazard(s) mitigated, responsible agency/department, and relative priority rank taken from the Benefit-Cost Review.

TABLE 4.2: MITIGATION ACTION IDENTIFICATION 2023

Mitigation Activity	Hazards Mitigated	Responsible Department	Priority
2023.HMP.01 - Review emergency materials inventory, identify potential gaps, and procure items to improve continuity of operations. Include redundant structural materials to minimize emergency repair time.	All Hazards	Warehouse	Medium
2023.HMP.02 - Emergency Operations Center upgrades and training. Coordinate training for all EOC responders. Laptops for response capabilities, and additional technology to impro	All Hazards	SREM	High
2023.HMP.03– Continue to upgrade communications systems to ensure interoperability during a disaster.	All Hazards	SREM	Medium
2023.HMP.04- Purchase additional satellite phones to improve emergency communications	Earthquake/ Flood & Dam / Reservoir Failure	SREM	High
2023.HMP.05 – Purchase a 40-ton crane to increase EMWD's ability to respond to emergencies and maintain critical infrastructure.	Extreme Weather	Water Operations/ Maintenance Services	Medium
2023.HMP.06 - Conduct an analysis of critical facilities to determine level of imperviousness to extreme weather events and utilize the maintenance schedule to make upgrades to improve resiliency	Extreme Weather	Water Operations/ Maintenance Services	Medium
2023.HMP.07 – Continue to include considerations for extreme weather (i.e., wind, high heat, excessive rain, etc.) events into new building planning documents	Flood & Dam/Reservoir Failure	Operations/ Engineering	High
2023.HMP.08 – Continue assessments to elevate at-risk subterranean facilities to above grade locations and ensure future builds are assessed for risk.	Flood & Dam/Reservoir Failure	Operations/ Engineering	Low
2023.HMP.09- Identify facilities located within the updated dam inundation zones currently under development by Riverside County and implement mitigation projects as appropriate.	Infrastructure Failure/ Power Failure	SREM/ Engineering Services	Low
2023.HMP.10 – Review and enhance infrastructure maintenance and monitoring schedules to increase the opportunity to identify and repair equipment prior to failure.	Wildfire	Operations and Maintenance	High
2023.HMP.11– Review brush clearance standards, particularly for facilities in fringe areas, and identify ways to expand clearance areas. Prioritize those facilities identified as being vulnerable to wildfire.	Wildfire/ Earthquake	Maintenance Services	Medium

2023.HMP.12 - Purchase emergency water tenders for use during wildfire/ seismic incidents	Hazardous Material Release/ Earthquake	SREM	Medium
2023.HMP.13 – Establish a Multi- hazard Response Emergency Response Team; Hazardous Materials, trench rescue, and elevated surface rescue	All Hazards	SREM	High

6. MONITORING, EVALUATING, AND UPDATING THE PLAN

The Hazard Mitigation Plan is a living document that reflects ongoing hazard mitigation activities and requires monitoring, evaluating, and updating to ensure mitigation actions are implemented. To facilitate the Hazard Mitigation Planning process and adhere to regulatory requirements, the Plan will be reviewed annually, and any major revisions will be incorporated into the five-year update. In addition, public involvement will be requested when applicable. Chapter 5: Plan Maintenance outlines the update requirements and planning mechanisms EMWD has in place for ongoing hazard mitigation.

1 PLANNING PROCESS

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1.1 NARRATIVE DESCRIPTION OF THE PLANNING PROCESS

§201.6(b): In order to develop a more comprehensive approach to reducing the effects of natural disasters, the planning process **shall** include:

(1) An opportunity for the public to comment on the plan during the drafting stage and prior to plan approval.

(2) An opportunity for neighboring communities, local and regional agencies involved in hazard mitigation activities, and agencies that have the authority to regulate development, as well as businesses, academia, and other private and non-profit interests to be involved in the planning process; and

(3) Review and incorporation, if appropriate, of existing plans, studies, reports, and technical information.

§201.6(c)(1): [The plan **shall** document] the planning process used to develop the plan, including how it was prepared, who was involved in the process, and how the public was involved.

Hazard mitigation planning is a dynamic process built on realistic assessments of past and present information that engages the Eastern Municipal Water District (District) to anticipate future hazards and provide meaningful strategies to address possible impacts and identifies needs. The hazard mitigation planning process involves the following tasks:

- Organizing resources
- Assessing risks
- Developing mitigation strategies, goals, and priorities
- Adopting the plan
- Implementing the plan
- Monitoring progress
- Revising the plan as necessary

FIGURE 1.1: HAZARD MITIGATION PLANNING CYCLE

The overall approach to updating the Hazard Mitigation Plan (HMP) includes building off the baseline understanding of hazards defined in the 2017 Hazard Mitigation Plan, determining ways to continue reducing those risks, and prioritizing those recommendations for implementation. The following task descriptions provide a detailed narrative of the overall project progression.

ORGANIZE RESOURCES

Identify Stakeholders and Compile Advisory Committee

Zuzzette Bricker, Safety & Emergency Management Officer for EMWD and Safety, Risk, and Emergency Management, invited and coordinated participation for an HMP meeting from local law enforcement, local government representatives, and EMWD personnel. A Taskforce was also established consisting of different department representatives from EMWD, responsible for providing essential insight into past hazard events, current hazard vulnerability (including specific locations), critical assets, and possible mitigation projects. Although participation was limited due to personnel availability and varying levels of interest from outside agencies, the following groups were invited to participate in the plan development.

- Key EMWD Personnel (Engineering, Safety & Risk, Environmental, Water Operations, Maintenance, and Board of Directors Administration)
- Local City Personnel
- Local Fire Departments
- Riverside County

Public Process

The Disaster Mitigation Act of 2000 requires an "Open and Public Process" for developing the HMP. This process requires, at a minimum, the public to be allowed to comment on the HMP during the draft phase and before adoption. To meet this requirement, EMWD published a survey to allow for public comment during the drafting stage of the HMP before creating a draft for submission to the California Governor's Office of Emergency Services (Cal OES) and the Federal Emergency Management Agency (FEMA) for review. The public survey was sent out via constant contact. Documentation of public outreach is included in Appendix .

RISK ASSESSMENT

Identify Hazards

This task was designed to identify all the natural and man-made hazards that *might* affect EMWD and then narrow the list to the hazards that are most likely to occur. The risks included natural, technical, and human-caused events, emphasizing each disaster's effect on EMWD's critical assets. To compile the list, the Taskforce built upon the list of hazards identified in the 2017 HMP and then continued researching newspapers, historical records, and websites to determine any additional hazards. In addition, the HMP Taskforce reviewed the list of hazards that have affected EMWD in the past with specific information regarding frequency, magnitude, and associated consequences. A hazard identification exercise was conducted during the first Taskforce meeting to identify and evaluate each selected hazard. The following hazards were included in the HMP update.

- Earthquake
- Extreme Weather
- Flood & Dam/Reservoir Failure
- Infrastructure Failure
- Wildfire
- Hazardous Material Release
- Terrorism
- Power Failure
- Drought
- Pandemic

This list does not include all the hazards discussed during the Hazard identification discussion. Hazards no longer considered a significant risk to EMWD were removed from the Plan update. In addition, we captured some items as sub-items of the threats listed above. For example, climate change is discussed with risks where the impact of changes in weather patterns could act as a catalyst for those scenarios (i.e., Flooding, Wildfire, and Drought).

Profile Hazard Events

The hazard event profiles consist of either a map indicating the area impacted by each hazard or an essential piece of data regarding the characteristics of hazard events within EMWD or the surrounding area. The Taskforce researched and reviewed relevant open-source hazard studies and mapping projects to update each detailed hazard profile. In addition, EMWD supplied any hazard studies explicitly developed for EMWD. This task determined the hazard magnitude, frequency, and location characteristics (e.g., predicted ground acceleration values, fault locations, flood plains, etc.) used as the design basis for the loss estimates and hazard ranking.

Asset Inventory

This task aimed to determine the number of assets in the different hazard areas and what portion of the service area this represents. The asset inventory was completed by reviewing a list of District assets from the 2017 HMP and including any new or missing facilities.

The completed asset inventory enabled the HMP Taskforce to estimate losses resulting from hazard events and to determine where resources should be allocated to address mitigation issues.

Loss Estimates

FEMA developed a standardized natural hazard loss estimation methodology containing models for estimating potential losses from an earthquake, wind (hurricanes, thunderstorms, tornadoes, and extra-tropical cyclones), and flood (river basin and coastal) hazards. EMWD used HAZUS-MH, a PC-based software, which implements the FEMA-developed methodology and runs on a Geographic Information System (GIS) platform, to map and display earthquake hazard data, as well as the results of earthquake damage and economic loss estimates for buildings and infrastructure within EMWD's service area.

HAZUS-MH contains baseline data such as:

- Demographic data (population, age, ethnicity, and income).
- General building stock (square footage of occupancy classes for each census tract).
- Emergency response facilities (fire, police, emergency operations centers).
- Medical care facilities.
- Roads, airports, and other transportation facilities; and
- Schools.
- Dams.
- Hazardous materials facilities.
- Electric power, oil and gas lines, and other utility facilities.

In estimating losses, HAZUS-MH considers various impacts of hazard events such as:

- Physical damage: damage to residential and commercial buildings, schools, critical facilities, and infrastructure.
- Economic loss: lost jobs, business interruptions, repair, and reconstruction costs; and
- Social impacts: impacts on people, including the potential loss of potable water and sanitation services.

In addition to the earthquake HAZUS-MH assessment, the HMP Taskforce developed loss assessment tables for each specific hazard that identifies potential damages within EMWD's service area, including population at risk, critical infrastructure, and buildings. This task is crucial in determining which assets are subject to the most significant potential damages and which hazard event is likely to produce the most significant potential losses. The conclusion of this step precipitated a comprehensive loss estimate (vulnerability assessment) for each identified hazard. The evaluation included estimates for all District assets in terms of damages, economic loss, and the associated consequences.

MITIGATION STRATEGY DEVELOPMENT

Development of Mitigation Goals and Objectives

The HMP Taskforce discussed mitigation features and resources EMWD currently has in place. These mitigation features provided a framework to determine where practical improvements could be made and where sufficient progress would be prohibitive due to cost, schedule, or impracticality of implementation.

For each hazard event, mitigation goals and objectives were created to reduce or eliminate the potential hazard impacts. The mitigation goals and objectives from the 2017 HMP were reevaluated and, where necessary, rewritten at an HMP Taskforce Meeting to provide the basis for determining the associated mitigation projects.

Identify and Prioritize Mitigation Actions

Mitigation strategies are administrative and engineering project recommendations to reduce the vulnerability to the identified hazards. It was imperative to have critical District staff, representatives from Riverside County, and local emergency preparedness planners involved in this phase of the plan to develop strategies and projects that will mitigate hazards cost-effectively and ensure consistency with EMWD's long-term mitigation goals and capital improvements. At an HMP Taskforce meeting, a team-based approach was used to review existing, and brainstorm new mitigation projects based on the identified hazards and associated loss estimates. The evaluation and prioritization of the mitigation actions produced a list of recommended mitigation actions to incorporate into the HMP. The HMP Taskforce also conducted a Benefit-Cost Review for each proposed mitigation action to determine the relative priority level of the recommendation.

IMPLEMENTATION & MONITORING

Prepare an Implementation Strategy

The HMP Taskforce developed an action plan to detail how the mitigation recommendations will be prioritized, implemented, and administered by EMWD. During the HMP creation process, the HMP Taskforce discussed the mitigation project implementation strategy, including identifying responsible departments, allocating funding resources, and estimating timeframes.

1.2 HMP TASKFORCE & PUBLIC INVOLVEMENT

While EMWD and Safety, Risk, and Emergency Management had lead responsibility for updating the HMP, neighboring communities, agencies, and other interested parties were invited to participate in the HMP Taskforce to review the HMP during each phase of document development. Each participating member of the HMP Taskforce had the opportunity to impact all aspects of the planning process. In addition, EMWD personnel assessed community support for proposed plan revisions through active community involvement, engaging the public through a public survey.

§201.6(b): In order to develop a more comprehensive approach to reducing the effects of natural disasters, the planning process **shall** include:

(1) An opportunity for the public to comment on the plan during the drafting stage and prior to plan approval.

(2) An opportunity for neighboring communities, local and regional agencies involved in hazard mitigation activities, and agencies that have the authority to regulate development, as well as businesses, academia, and other private and non-profit interests to be involved in the planning process; and

§201.6(c)(1): [The plan **shall** document] the planning process used to develop the plan, including how it was prepared, who was involved in the process, and how the public was involved.

1.2.1 HMP TASKFORCE PARTICIPANT SOLICITATION

EMWD solicited participation in the HMP by contacting both internal and external stakeholders. Internal stakeholders included members of various departments. External stakeholders comprised representatives from local agencies and the County of Riverside.

1.2.2 HMP TASKFORCE PARTICIPANTS

EMWD brought together personnel from Planning, Engineering & Construction Engineering, Public Affairs, Safety, Risk, & Emergency Management (SREM), Operations & Maintenance, Water Operations, Water Reclamation, and the Riverside County Emergency Management Division to ensure the HMP Taskforce included members with a variety of backgrounds. Additionally, EMWD compiled historical data, provided relevant planning documents for incorporation into the HMP, and

coordinated participation with the public through a survey. The HMP Taskforce reviewed each draft chapter, and specific comments and input were incorporated into the Plan. The multidisciplinary HMP Taskforce enabled EMWD to collaborate and incorporate everyone's expertise, providing a more comprehensive HMP.

The HMP was developed with assistance and advice from participants from EMWD and neighboring cities/agencies. Table 1.1 provides a list of the HMP Taskforce participants. Individuals are listed in alphabetical order by last name.

HMP Taskforce members met three times during the update to discuss project progress and obtain valuable input and information to include in the HMP update. The scope of these meetings is detailed over the following subsequent pages. Also, Appendix D – Public Participation contains copies of the presentation used at each meeting, specific meeting handouts, and attendance records.

TABLE 1.1: HMP TASKFORCE AND ALLIED AGENCIES PARTICIPANTS

Name	Affiliation	Title	M1	M2	M3
[redacted]	Eastern Municipal Water District	Safety & Emergency Management Officer	X		
	Eastern Municipal Water District	Safety & Emergency Management Officer	X	X	
	Eastern Municipal Water District	Director of Maintenance	X	X	
	Eastern Municipal Water District	Warehouse Manager	X		
	Eastern Municipal Water District	Director of Strategic Communications and Public Affairs	X		
	Eastern Municipal Water District	Director of Water Operations	X		
	Eastern Municipal Water District	Director of the Safety, Risk, and Emergency Mgmt. Dept.	X	X	
	Eastern Municipal Water District	Safety & Emergency Management Officer	X		
a	Eastern Municipal Water District	Asst. Gen. Mgr. of Planning, Engineering & Construction	X		
ew	Eastern Municipal Water District	Assistant General Manager of Ops & Maintenance	X		
	Eastern Municipal Water District	Senior Director of Engineering	X		
	Eastern Municipal Water District	Director of Water Reclamation	X		
	Eastern Municipal Water District	Purchasing and Contracts Manager	X		
	Riverside Sheriff	Sgt. Sheriff's Emergency Response Team (SERT)			
	City of Temecula	Emergency Manager			
	City of Perris	Building and Safety Manager			X
	City of Menifee	Emergency Management Analyst			
	Riv. Co. Emergency Mgmt. Div.	Emergency Services Coordinator			
	Pechanga Fire	Emergency Services Coordinator			
	City of Moreno Valley	Emergency management Specialist			

Name	Affiliation	Title	M1	M2	M3
[redacted]	Office of Education	Safety - Emergency Management, Coordinator			X
	City of San Jacinto	Administrative Analyst			
	City of Lake Elsinore	Emergency Services Manager			
	Perris Union School District	Risk, Loss Control and Emergency Manager			X
	City of Hemet	Chief of Police			
	RUHS	Sr. Safety Coordinator			X

1.2.3 HMP TASKFORCE MEETING DESCRIPTIONS

HMP Taskforce Meeting #1 – Project Mitigation Projects update

Date: June 20, 2022

FIGURE 1.2: EXAMPLE HAZARD IDENTIFICATION WORKSHEET

During the Hazard Mitigation Project update meeting, Safety, Risk, and Emergency Management gave an overview presentation of the projects from 2017. After the review of the projects, the HMP Taskforce participants were asked to provide project updates on what has been completed and what has not. Members were also asked to provide a summary of why any project was not completed and to start putting together a list of potential projects for the next cycle of mitigation planning. Due to the ongoing COVID-19 precautions the meetings were held via MS Teams rather than in person (sign-in sheet is from MS Teams login record). Several one-on-one meetings with different departments were conducted, also due to COVID-19 protocols.

The HMP Taskforce meeting also served as a mechanism to determine the hazards the Plan would profile in detail. To effectively characterize EMWD's risk and vulnerability, Safety, Risk, and Emergency Management facilitated a discussion of the historical hazards with the HMP Taskforce members. This meeting also served as a forum to discuss background information and obtain asset inventory specifics.

The HMP Taskforce determined the initial hazard profile ranking through a facilitated exercise using an automated interactive spreadsheet that asks specific questions regarding potential hazards and then assigns a relative value to each potential hazard, accordingly, including numerical rankings (1-5) of the following criteria:

- **Consequence/Severity** – How widespread is the impact area?
- **Secondary Effects** – Could the event trigger another event and separate response?
- **Probability/Frequency** – Historical view of how often this type of event occurs locally and projected recurrence intervals.
- **Warning/Onset** – Advance warning of the event or none.
- **Duration** – Length of elapsed time where response resources are active.
- **Recovery** – Length of time until lives and property return to normal.

Chapter 3: Risk Assessment outlines the methodology used for hazard rankings. All HMP Taskforce members were requested to provide existing plans and technical studies, GIS data, and identify existent mitigation features as part of a detailed information request.

Additionally, the Plan's goals and objectives were updated to reduce or eliminate the potential hazard impacts, which also provided the basis for determining the associated mitigation projects. The HMP Taskforce reviewed the goals and objectives from the 2017 HMP, the California State Multi-Hazard Mitigation plans, and the Riverside County Multi-Jurisdictional Hazard Mitigation Plan as a baseline for determining EMWD's mitigation goals and objectives.

Following this first meeting, the asset inventory was updated to determine if there were any changes in the number of buildings, facilities, and other assets in the different hazard areas and what portion of the service area they represent. The asset inventory included locations and specific information for administration buildings, pipelines, storage tanks, booster stations, lift stations, wells, water treatment, and water reclamation facilities. The asset inventory was reviewed with the HMP Taskforce to ensure completeness, and assignments were given to those who could retrieve the missing information.

Taskforce Meeting #2 – Mitigation Action Identification and Benefit-Cost Review

Date March 14, 2023

The purpose of the second meeting was to identify potential mitigation actions and projects that will reduce the impact of identified hazards. First, the mitigation goals and objectives from HMP Taskforce #1 were reviewed and validated. Then, the HMP Taskforce participants brainstormed possible projects and actions to mitigate the identified hazards' effects. The hazard profiles and asset-specific loss estimates were used as starting points.

As the mitigation projects were identified, the HMP Taskforce discussed the implementation plan in terms of the following characteristics:

- Mitigation Action Category – Prevention, Property Protection, Public Education and Awareness, Natural Resources Protection, Emergency Services, and Structural Projects
- Corresponding Goals and Objectives
- Responsible Department – Operations, Safety & Risk, Engineering, Administration, Flood Control, Integrated Planning, etc.
- Resources – Operating Budget, Grant Programs, Staff Time, Capital Improvements Fund, etc.
- Implementation Timeframe – Ongoing, Short-term (within two years), Medium- term (between three and ten years), and Long-term (greater than ten years)
- Whether the project protects new or future facilities

The HMP Taskforce then performed a high-level Benefit-Cost review on each identified mitigation action. The assessment identified all perceived benefits and costs associated with implementing each mitigation action. Typical benefits include:

- Avoided physical damages (e.g., to buildings, infrastructure, and equipment)
- Avoided loss of function costs (e.g., loss of utilities and lifelines)
- Avoided casualties
- Avoided emergency management costs (e.g., emergency operations center costs, evacuation/rescue costs, and other management costs)

FIGURE 1.3: EXAMPLE FEMA BENEFIT-COST ANALYSIS

Actions	Benefits (Pros)	Costs (Cons)	Priority
Floodproof 10 businesses in the downtown area	- Avoidance of 1 loss of life every 20 years (casualties reduced by half) - Saving of $90,000 in private damages and $5,500 in public cost - Loss of use of 10 downtown businesses completely eliminated - Community's problem of business interruption solved - Federal grants like FMA and PDM can be applied for to implement the proposed floodproofing - Will help improve CRS rating in the long term (so entire community's flood insurance premium will be reduced) - More than half the members of the City Council are opposed to bug-outs; it might be easier to get their support for an alternative to bug-outs	- Floodproofing cost = $20,000 X 10 = $200,000 - Need at least 2 people to administer (after obtaining technical assistance from the State) - Need a year to implement	High (Priority no. 1)
Build safe rooms for a neighborhood of 80 homes without basements	- Avoidance of 4 lives lost every 20 years (casualties reduced by half) - Public and political support for mitigating this hazard exists (due to regular recurrence of tornadoes)	- City will share 50% of the cost per existing home = $2,500 X 30 = $300,000 - Administrative cost per home = $1,000 X 30 = $30,000 - Need 3 years to complete - Tornadoes are unpredictable; they may never strike this exact area again	Medium (Priority no. 2)

Once the benefits and costs were estimated, each action's relative priority was assigned based on the evaluation.

Taskforce – Asset Inventory and Vulnerability Assessment (via email / survey)

Date: May 10,2023

As part of the HMP Taskforce meetings, the completed asset inventory was used to develop loss estimates for all identified hazard scenarios. The hazard probabilities and recurrence intervals were applied to EMWD's assets to determine which assets were subject to the most significant potential damages and which hazard events were likely to produce the most significant possible losses.

Additionally, each HMP Taskforce participant was asked to score hazard vulnerabilities within EMWD service area as part of the Hazard vulnerability assessment.

HMP Meeting #3 – Partner Agencies

A meeting was coordinated with local agencies in EMWDs service area to provide an overview of EMWDs LHMP. EMWD's goals and objectives, the process, and ask for feedback. Those in attendance

did not provide any recommended changes to the mitigation actions presented. Attached to the meetings appendix is the Teams meeting attendance which includes those that attended as well as those that were invited to attend.

1.2.4 PUBLIC MEETINGS & OUTREACH

On April 3, 2023, EMWD sent out a message through constant contact inviting the public to participate in a survey. The survey assessed the community's level of concern with various hazards and steps respondents had taken to prepare for a disaster. The survey responses were from nine different zip code areas. Several of those are high density senior areas and non-English/minimal-English speaking. The map below shows the zip code areas. Additional demographic information can be found in appendix D. As part of the survey, we asked "What are the best ways to receiving information about making your family and home safer from local disaster?" Having this information allows EMWD to send out information in the most beneficial format; adding preparedness tips to the EMWD newsletter, a good mitigation strategy as it was tied with mail as the most desired format. Copies of Census information is attached in Appendix D.

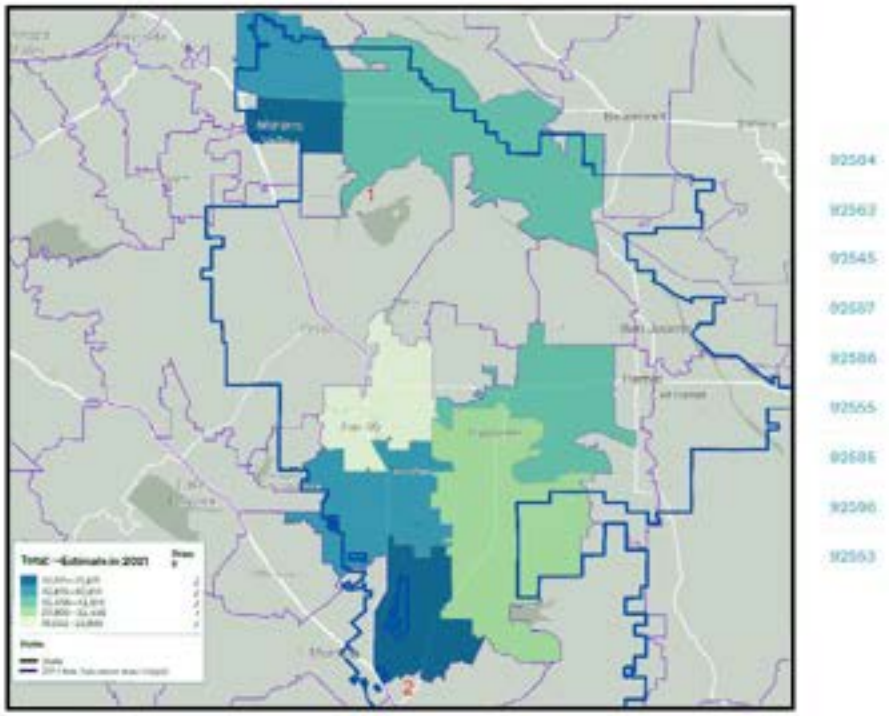

Figure 1 – US Census bureau map with EMDW overlay.

On August ___, 2023, EMWD posted the final draft Plan on the EMWD website, allowing members of the public to provide input for HMP development during the drafting stage. Additional documentation regarding public involvement is provided in Appendix D.

1.3 REVIEW AND INCORPORATION OF EXISTING PLANS

§201.6(b): In order to develop a more comprehensive approach to reducing the effects of natural disasters, the planning process **shall** include:

(3) Review and incorporate, if appropriate, existing plans, studies, reports, and technical information.

While developing EMWD's HMP, the HMP Taskforce reviewed the existing plans detailed below and incorporated relevant information into the planning efforts.

2016 State of California Multi-Hazard Mitigation Plan

The Multi-Hazard Mitigation Plan was reviewed to ensure consistency between the State and District Plan with respect to identified hazards, vulnerability, goals & objectives, and mitigation actions. The State goals served as the basis for goal development at the EMWD level. Plan goals and objectives are outlined in Chapter 4.

2017 Riverside County Multi-Jurisdictional Local Hazard Mitigation Plan

Like the California Multi-Hazard Mitigation Plan, the Riverside County Multi-Jurisdictional Hazard Mitigation Plan was reviewed to ensure consistency between the County and EMWD Plans. In addition to serving as a basis for goal development (along with the State Plan), the County Plan provided insight into local historical hazards and perceived vulnerability for the region.

Separately, Riverside County and EMWD were updating their respective plan concurrently. As a member of the Riverside County Planning Team, EMWD could take advantage of the County's efforts and information during the HMP update.

2017 Hazard Mitigation Plan

EMWD's 2017 HMP was crucial in comparing the previous mitigation ideas and attitudes to EMWD's current needs and concerns. The HMP Taskforce referred to this Plan constantly throughout the updating process. The Plan provided insight into hazard ranking, history, previous proposal mitigation projects, etc. Due to COVID-19 activities several projects were delayed.

2020 Urban Water Management Plan

The 2020 Urban Water Management Plan is updated every five years to monitor water supply issues and mitigate drought situations. Since the Urban Water Management Plan was recently updated, EMWD was able to pull information regarding current trends in population, weather patterns, and existing conservation efforts.

Asset Management Program

EMWD's Asset Management Plan was in the process of being updated when the HMP was last revised and was used to develop a complete asset inventory. In addition to contributing to a full list of assets, the program provided realistic estimates for replacement values for critical assets. Fewer estimates were based partly on information provided in the Asset Management Program. For more details, please see the Loss Estimates section in Chapter 3.

California Adaptation Planning Guide 2020

FEMA, Cal OES, and the California Natural Resources Agency developed the California Adaptation Planning Guide to assist municipalities in recognizing local climate change and providing guidance in addressing potential vulnerabilities. The information was used to develop potential hazards and to provide background information that allowed the HMP Taskforce to make educated decisions regarding mitigation actions designed to alleviate the effects of climate change.

2 PLANNING AREA PROFILE

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Tables

2.1 Service Area Description

The Eastern Municipal Water District (District) is a public water agency formed in 1950 by popular vote. In 1951, it was annexed into the Metropolitan Water District of Southern California (MWD). It gained a supply of imported water from the Colorado River Aqueduct (CRA) and the State Water Project (SWP).

EMWD's initial mission was to deliver imported water to supplement local groundwater for the primarily agricultural community. Over time, EMWD has evolved to include groundwater production, desalination, water filtration, wastewater collection, treatment, and regional water recycling in the list of products and services it offers to more than 603,950 retail and 255,210 wholesale customers. Located in one of the most rapidly growing regions in the Nation, EMWD has a mission "to provide safe and reliable water and wastewater management services to our community in an economical, efficient, and responsible manner, now and in the future."

A five-member Board of Directors governs EMWD. Each Director serves an area of equivalent population size within the EMWD's boundaries and is elected to office every four years. As a member agency of MWD, EMWD has a board member appointed to the MWD Board of Directors.

EMWD Service Area is located in western Riverside County, approximately 75 miles east of Los Angeles. The 558-square-mile service area includes six incorporated cities and several unincorporated areas of the County of Riverside. Figure 2.1, found later in his chapter, provides an overview of the service area boundaries.

2.2 Development Trends

§201.6(c)(2)(ii)(C): [The plan **should** describe vulnerability in terms of] providing a general description of land uses and development trends within the community so that mitigation options can be considered in future land use decisions.

Since EMWD is not responsible for general land use for most of the land within its service area, it relies on the General Plans adopted by local Cities and Riverside County to anticipate future development. However, as mentioned above, EMWD provides water and wastewater services. Development trends for both service types are outlined in the subsections below.

Water Service

Retail Customers: EMWD provides potable water service to retail customers within the Cities of Moreno Valley, Menifee, and Temecula, as well as the unincorporated communities of Good Hope, Homeland, Lakeview, Nuevo, Mead Valley, Murrieta Hot Springs, San Jacinto, Quail Valley,

Romoland, Valle Vista, and Winchester. Residential use makes up the most significant percentage of the demand, with single-family residences making up over 65% of the demand. As discussed in Section 2.3, the population is expected to increase rapidly within the service area, over 60%, by 2040. As a result, residential use will likely remain the most significant water allocation within EMWD. Landscape irrigation, at just under 10%, makes up the second-largest category of retail water use. Table 2.1 below demonstrates the percentage for each water-use category served by EMWD.

Table 2.1: Retail Water Use by Type

Water Use Type	Percentage
Single-Family	57.9%
Multi-Family	7.4%
Commercial	5.8
Industrial	.3
Institutional/ Governmental	3%
Landscape	9.8%
Agriculture irrigation (Potable Water)	2.4%
Agricultural irrigation (Raw Water)	1.1%
Other (temporary construction meters, unbilled consumption)	7%
Losses	5.3%
Total Retail Use:	**100%**

Note: Percentages are based on current retail demand for portable and raw water figures recorded in the 2020 Urban Water Management Plan

As noted above, EMWD has little impact on development trends within the Cities and unincorporated areas it serves. However, EMWD will work with local communities to identify potential hazards and look for ways to improve resiliency for new developments.

Wholesale Customers: In addition, EMWD also supplies water and wastewater services on a wholesale basis to the Cities of Hemet, San Jacinto, and Perris, as well as Lake Hemet Municipal Water District, Nuevo Water Company, Elsinore Valley Municipal Water District, Western Municipal Water District, and Rancho California Water District.

Additionally, the map on the following page depicts EMWD's service area boundary relative to the communities and major roads within the boundary.

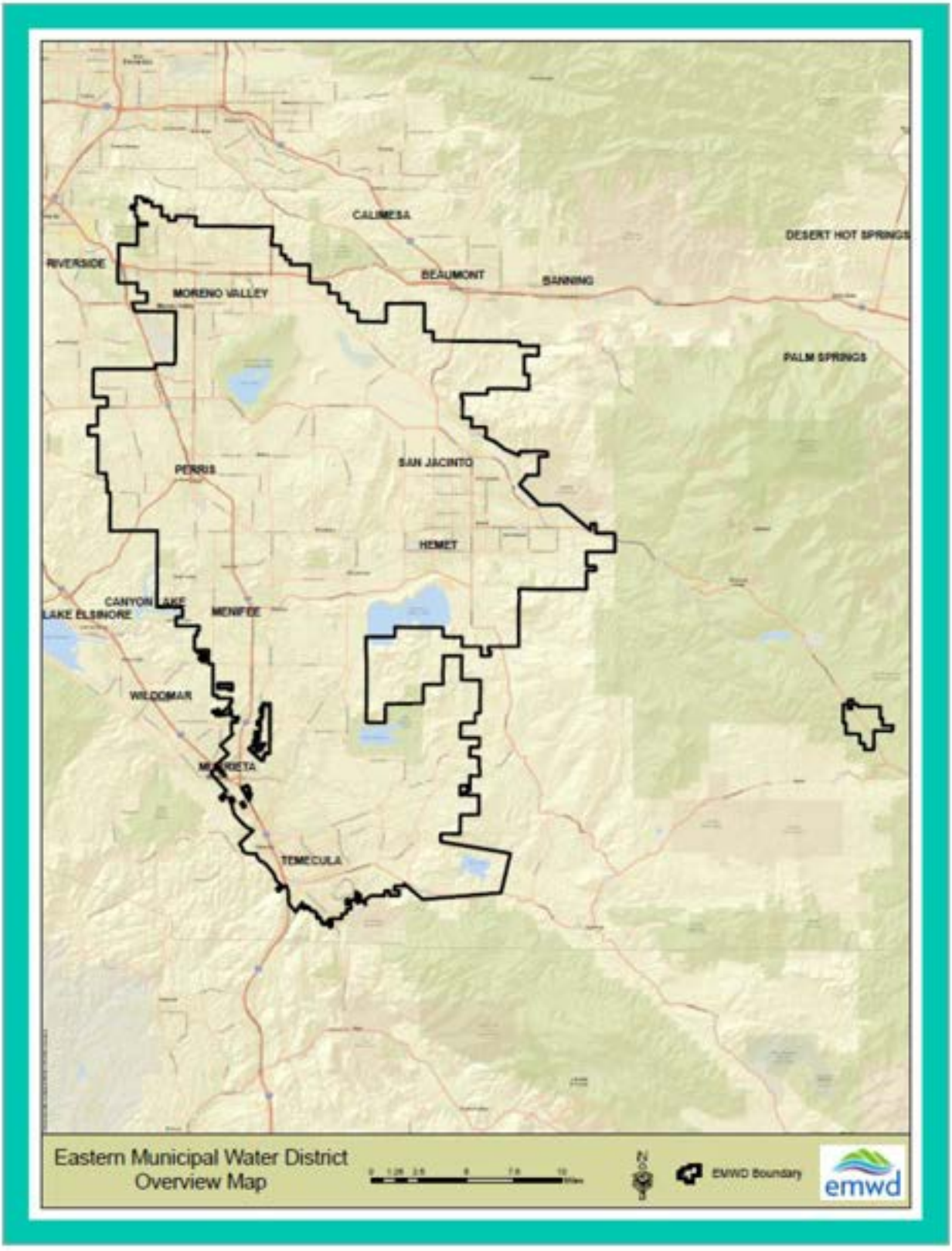
CALIMESA
DESERT HOT SPRINGS
RIVERSIDE
BEAUMONT
BANNING
MORENO VALLEY
PALM SPRINGS
PERRIS
SAN JACINTO
HEMET
CANYON LAKE
LAKE ELSINORE
MENIFEE
WILDOMAR
MURRIETA
TEMECULA
Eastern Municipal Water District
Overview Map
EMWD Boundary
emwd

Figure 2.1: District Service Area Overview

Wastewater Service

EMWD provides wastewater services to approximately 268,000 customers within its service area. It currently treats approximately 46 million gallons of wastewater daily at its four active regional water reclamation facilities through 1,962 miles of sewer pipelines. While only a portion of the EMWD's service area receives wastewater services, these areas are spread across the region. As a result, hazard considerations for wastewater should be the same as for water service.

New Developments

Since the 2017 Hazard Mitigation Plan update, assets will continue to be added to EMWD. The locations are not listed here as a security measure. Still, the assets, primarily storage tanks and lift stations, have been captured as part of the risk assessment in Section 3.13 Asset Inventory. EMWD implemented certain mitigation elements for each of these assets in the design and construction stage to lessen the impacts of potential hazard events. For example, backup generators were included for electric systems to reduce the impact of a power outage, and tanks were built above ground to minimize the impacts of flooding and earthquakes. The Taskforce discussed these new assets' impact on the EMWD's vulnerability and found them to be minimal.

2.3 Population

According to its 2020 Urban Water Management Plan, EMWD is in one of the most rapidly growing regions of the United States. Since 1990, nearly 530,268 people have been added to the EMWD's service area, doubling the population. The following table illustrates the estimated retail and wholesale populations within the EMWD's service area through 2045. The information is taken from the 2020 Urban Water Management Plan and was developed using Geographical Information System data, 2010 census tract records, information from State Water Resource Control Board reporting, and the Department of Water Resources' population projection methodology as the population within EMWD continues to grow, the characteristics of the service area are expected to change.

Table 2.2: District Service Area Population Projections

Population Served	2020	2025	2030	2035	2040	2045
Retail Population	603,950	649,700	695,500	741,300	774,300	807,200
Wholesale Population	255,210	271,500	287,800	304,000	314,000	324,100
Total:	856,500	967,100	1,075,200	1,178,600	1,274,100	1,131,300

Note: Population estimates are based on projections for potable and retail water figures recorded in the 2020 Urban Water Management Plan

Tract homes, commercial centers, and new industrial warehouses are replacing acres of agriculture and open spaces. Over the next 25 years, the EMWD's population is projected to grow by over 500,000 people, a 67% increase over the current population. The impact of the rapid growth on EMWD is limited to the associated increase in demand. EMWD will likely consider constructing new facilities to expand the current water system to meet this demand. No specific hazard vulnerabilities were identified for future infrastructure during the plan update; however, locations where future facilities may be exposed to natural hazards, including floodplains and fire history maps, are included in Chapter 3 of this Plan.

2.4 Climate

EMWD has a semi-arid climate characterized by hot, dry summers and cooler winters. The average rainfall is approximately 7.6 inches occurring primarily from December through March. The region experiences a wide variation in rainfall and periodic local drought. The following table information, taken from the 2020 Urban Water Management Plan, summarizes the temperature and precipitation for the EMWD's service area.

Table 2.3: District Service Area Climate

	Average Rainfall (inches)	Average Maximum Temperature (F°)	Average Minimum Temperature (F°)
January	1.4	67	35
February	2.0	62	33
March	2.4	65	37
April	1.3	70	41
May	0.3	72	46
June	0.0	81	51
July	0.0	92	60
August	0.0	94	60
September	0.0	91	57
October	0.2	82	47
November	1.1	74	40
December	1.8	66	35
Total/Average	**10.5**	**76**	**45**

Data from California Irrigation Management Information System (CIMIS) Station Winchester 179. Data from 2002 through 2020

3 RISK ASSESSMENT

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3.1 Risk Assessment

The Risk Assessment consists of four steps: Hazard Identification, Hazard Profiling, Asset Inventory, and Loss Estimates. This chapter includes the Hazard Identification and Hazard Profiling steps to evaluate the hazards of primary concern to local decision-makers to provide a basis for loss estimates which are also included within this chapter. Additionally, the Risk Assessment provides a foundation for evaluating mitigation measures that can help reduce the impacts of a potential hazard event.

Step 1: Identify Hazards

This step identified all the natural and man-made hazards that might affect the Eastern Municipal Water District (EMWD) and then narrowed the list to the hazards that are most likely to occur. These hazards included natural, technical, and human-caused events emphasizing the effect of disasters on critical facilities and services (e.g., treatment plants, reclamation facilities, well sites, lift stations, and booster stations). The Taskforce participated in a hazard identification exercise during the first Taskforce meeting to identify and rank the potential hazards within EMWD's service area.

Step 2: Profile Hazard Events

Hazard event profiles were updated from the 2017 Hazard Mitigation Plan and consisted of either a map indicating the area impacted by each hazard or critical information regarding the characteristics of hazard events within the service area. To develop detailed hazard profiles, and relevant open-source hazard studies, the County Multi-Jurisdictional Hazard Mitigation Plan and mapping projects were reviewed and documented within this report. In addition, EMWD supplied local account of hazard events that included specific hazard and emergency information. This planning step also determined the magnitude, frequency, and location characteristics of relevant natural hazards (wildfire, fault locations, flood plains, etc.) that were utilized as the design-basis for the loss estimates where possible.

Step 3: Inventory Assets

The purpose of this step is to determine the quantity of buildings and assets in EMWD's service area that lie in the different hazard areas and what proportion of EMWD this represents. The development of the comprehensive inventory facilitated the development of loss estimates for all hazard scenarios

Step 4: Loss Estimates

The Loss Estimate step relied on detailed information regarding the hazard probability and maps of asset locations that were not included in the Plan for security reasons. This information was utilized to apply

the hazard probabilities and recurrence intervals to EMWD's assets and inventory (buildings and infrastructure). This step was critical in determining which assets were subject to the greatest potential damages and which hazard events were likely to produce the greatest potential losses.

The HAZUS-MH software package, which implements the Federal Emergency Management Agency's (FEMA) developed methodology and runs on a GIS platform, was utilized by the County to map and display earthquake hazard data, as well as the results of damage and economic loss estimates for buildings and infrastructure within the County. The Taskforce refers to the County's map as an indicator of the extent of damage an earthquake event might generate. To estimate potential losses for the remaining hazards, detailed spreadsheets, including asset inventory and potential hazards, were used to find the monetary impact of each hazard to EMWD.

In estimating losses, HAZUS-MH and the spreadsheets consider various impacts of a hazard event such as:

- Physical damage: damage to public buildings, critical facilities, and infrastructure
- Economic loss: lost jobs, business interruptions, repair and reconstruction costs; and
- Social impacts: impacts to people, including requirements for shelters and medical aid.

While many of the damages to local infrastructure and the economy included in the HAZUS-MH model do not directly impact EMWD, District emergency planners can use the report to examine the "bigger-picture" with regard to the impacts of an earthquake hazard scenario. It should be noted, any regional disaster would affect, and possibly overwhelm, local emergency responders potentially inhibiting EMWD's ability to manage its own response. Therefore, it is prudent for District personnel to look at the large-scale impacts of a disaster scenario.

The conclusion of this step precipitated a comprehensive loss estimate (vulnerability assessment) for each identified hazard for each specific asset in terms of damages, economic loss, and the associated consequences for EMWD.

3.2 Hazard Identification

§201.6(c)(2)(i): [The risk assessment **shall** include a] description of the type, location, and extent of all-natural hazards that can affect the jurisdiction. The plan shall include information on previous occurrences of hazard events and on the probability of future hazard events.
§201.6(c)(2)(ii): [The risk assessment **shall** include a] description of the jurisdiction's vulnerability to the hazards described in `paragraph (c)(2)(i) of this section. This description shall include an overall summary of each hazard and its impact on the community.
§201.6(c)(2)(ii): [The risk assessment] **must** also address National Flood Insurance Program (NFIP) insured structures that have been repetitively damaged floods.
§201.6(c)(2)(iii): For multi-jurisdictional plans, the risk assessment **must** assess each jurisdiction's risks where they vary from the risks facing the entire planning area.

The hazard identification and ranking were obtained from the Hazard Identification Exercise. Each hazard profile includes a summary of the Hazard Identification Exercise's identified risk factors and overall rank for each hazard in addition to the detailed hazard description, historical occurrences, and projected future probability, magnitude, and frequency.

The Hazard Identification Exercise was conducted by the taskforce to identify the potential hazards within EMWD's service area. The Hazard Identification Exercise was facilitated utilizing an interactive spreadsheet that asks specific questions on potential hazards and then rated them accordingly. Table 3.1 summarizes the Hazard Identification Exercise risk factors, lists the descriptions of each factor, provides the specific descriptor choices for each risk factor and description, and summarizes the risk ranking associated with each hazard.

Table 3.1 Risk Factors for Hazard Identification

Risk Factor	Description	Descriptors	Value
Probability / Frequency	Prediction of how often a hazard will occur in the future	Infeasible event - not applicable due to geographic location characteristics	0
		Rare event - occurs less than once every 50 years	1
		Infrequent event - occurs between once every eight years and once every 50 years (inclusive)	2
		Regular event - occurs between once a year and once every seven years	3
		Frequent event - occurs more than once a year	4
Consequence / Severity	Physical Damage - structures and lifelines Economic Impact – loss of function for power, water, sanitation, roads, etc.	No damage	1
		Minor/slight damage to buildings and structures, no loss of lifelines	2
		Moderate building damage, minor loss of lifelines (less than 12 hours)	3
		Moderate building damage, lifeline loss (less than 24 hours)	4
		Extensive building damage, widespread loss of lifelines (water, gas, electricity, sanitation, roads), loss of life	5
Vulnerability	Impact Area - area impacted by a hazardous event Secondary Impacts - Capability of triggering additional hazards Onset - Period between initial recognition of an approaching hazard and when the hazard begins to impact the community	No physical damage, no secondary impacts	1
		Localized damage area	2
		Localized damage area, minor secondary impacts, delayed hazard onset	3
		Moderate damage area, moderate secondary impacts, moderate warning time	4
		Widespread damage area, significant secondary impacts, no warning time	5

Each profile also includes a profile ranking of the hazard (ranging from low hazard to high hazard). Table 3.2 illustrates the matrix for how each hazard was ranked according to all the previously mentioned factors. Table 3.3 provides the value determinations for each ranking. The Taskforce created this profile ranking based on references to the 2017 Hazard Mitigation Plan, up-to-date hazard identification, profile research, group discussion and evaluation of available data.

Table 3.2 Risk Rank Matrix

Probability/Frequency Description	Risk Ranking Matrix						
Rare Event: Occurs less than once every 50 years	Probability/Frequency		Consequence/Severity				
	Value	1	1	2	3	4	5
	Vulnerability	1	1	2	3	4	5
		2	2	4	6	8	10
		3	3	6	9	12	15
		4	4	8	12	16	20
		5	5	10	15	20	25
Infrequent Event: Occurs between once every 8 years and once every 50 years (inclusive)	Probability/Frequency		Consequence/Severity				
	Value	2	1	2	3	4	5
	Vulnerability	1	2	4	6	8	10
		2	4	8	12	16	20
		3	6	12	18	24	30
		4	8	16	24	32	40
		5	10	20	30	40	50
Regular Event: Occurs between once a year and once every 7 years	Probability/Frequency		Consequence/Severity				
	Value	3	1	2	3	4	5
	Vulnerability	1	3	6	9	12	15
		2	6	12	18	24	30
		3	9	18	27	36	45
		4	12	24	36	48	60
		5	15	30	45	60	75
Frequent Event: Occurs more than once a year	Probability/Frequency		Consequence/Severity				
	Value	4	1	2	3	4	5
	Vulnerability	1	4	8	12	16	20
		2	8	16	24	32	40
		3	12	24	36	48	60
		4	16	32	48	64	80
		5	20	40	60	80	100

Table 3.3: Risk Rank Categorization

High Hazard	50 to 100
Moderately High Hazard	25 to 49
Moderate Hazard	15 to 24
Moderately Low Hazard	5 to 14
Low Hazard	1 to 4

3.2.1 Hazard Profiling

This Section presents additional information regarding the hazards of concern (details below) within the hazard profiles. Hazard profiles are designed to assist agencies in evaluation and comparing the hazards that can impact their community by comparing a few hazard factors. Each type of hazard has unique characteristics and the impact associated with a specific hazard can vary depending on the magnitude and location of each event. For the purposes of this plan, a hazard event can be defined as a specific, uninterrupted occurrence of a particular type of hazard. Furthermore, the probability of occurrence for a hazard in each location impacts the priority assigned to that hazard. Finally, each hazard will impact different communities in different ways, based on geography, local development, population distribution, age of buildings, and mitigation measures already implemented. Table 3.4 provides the hazard ranking summary for EMWD.

Table 3.4: Hazard Ranking Summary

Hazard Rank	Score
High	
Earthquake	75
Moderately High	
Extreme Weather	36
Flood & Dam/Reservoir Failure	32
Infrastructure Failure	32
Wildfire	27
Hazardous Material Release	25
Terrorism	25
Moderate	
Power Failure	24
Moderately Low	
Drought	9
Low	

3.2.2 Trends in Perceived Hazard Vulnerability

As illustrated above, the Taskforce reviewed its perceived vulnerability to determine the potential impact of each hazard on EMWD. The Taskforce began with the hazards identified in 2017 Hazard Mitigation Plan and used the list as a springboard in determining current perceived vulnerability. In some cases, it was determined that a change in labeling made more sense and in some cases the hazard was removed all together. Table 3.5 below documents the modified or removed hazards.

Table 3.5: Removed and Modified Hazards

2023 Identified Hazard	Comments
Earth Movement/ Landslide	The Taskforce felt it made sense to remove landslide as a major component of this hazard. As stated in the 2017 Hazard Mitigation Plan, EMWD has never incurred any damage as the result of a landslide. Furthermore, the topography of the area is relatively flat and, if a landslide were to occur, it would be likely be the result of an earthquake or flood (through erosion), both of which are captured as identified hazards in the updated Plan. For the current Plan, this hazard was reclassified as earthquake.
Pipeline Failure	The Pipeline Failure hazard focused on gas lines which are outside EMWD's jurisdiction and rarely impact its assets. The Taskforce discussed the impact of water pipeline failure and then expanded the scope to include other types of system failures to create a new Infrastructure Failure hazard in the Plan update.
Extreme Heat	Extreme heat, severe storm and Tornado were combined into Extreme Weather in the plan update to simplify the discussion and to allow for expansion of the scope of the hazard in the future.
Flood	Understanding that the impact of a flood due to heavy rain or dam release produced similar perceived impacts in EMWD's case, Flood and Dam Release were combined into a single hazard in the updated Plan.
Dam Failure	Understanding that the impact of a flood due to heavy rain or dam release produced similar perceived impacts in EMWD's case, Flood and Dam Release were combined into a single hazard in the updated Plan.
San Onofre Nuclear Plant Failure	The San Onofre Nuclear Plant has been decommissioned and is no longer a threat to the region. As a result, this hazard was removed during the 2017 update process.
Severe Storm	Extreme heat, severe storm and Tornado were combined into Extreme Weather in the plan update to simplify the discussion and to allow for expansion of the scope of the hazard in the future.
Tornado/Wind	Extreme heat, severe storm and Tornado were combined into Extreme Weather in the plan update to simplify the discussion and to allow for expansion of the scope of the hazard in the future.

Table 3.5: Removed and Modified Hazards

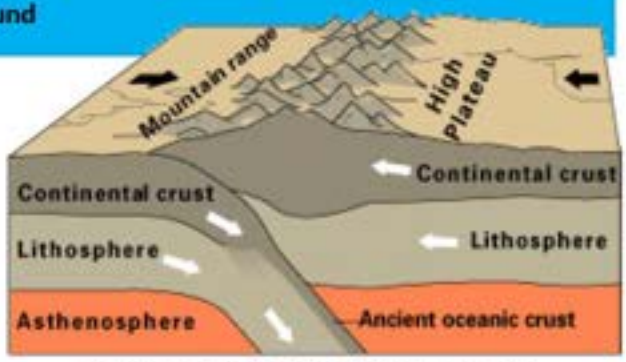
2023 Identified Hazard	Comments
Pandemic	Public health, except as it applies to water source reliability, is not under EMWD's jurisdiction. EMWD is not expected is it established to prevent the spread of contagious disease. As a result, this hazard was removed during the update process.
Transportation Accident	EMWD has no jurisdiction over the roadways that traverse EMWD. Local communities are responsible for traffic-related hazards. As a result, this hazard was removed during the update process.

3.3 Earthquake Hazard Profile

Earthquake Risk Assessment Summary	
Risk Rank Category: High	
Probability/Frequency:	Regular event - occurs between once a year and once every 7 years
Consequence/Severity:	Extensive building damage, widespread loss of lifelines (water, gas, electricity, sanitation, roads), loss of life
Vulnerability:	Widespread damage area, significant secondary impacts, no warning time
Location:	Earthquake events have the potential to impact all areas throughout EMWD.
Hazard Risk Rank Score	75
Taskforce Comments:	None

3.3.1 Earthquake Hazard Information and Background

Plate tectonics is a starting point for understanding the forces within the Earth that cause earthquakes. Plates are thick slabs of rock that make up the outermost 60 miles of the Earth. The term "tectonics" describes the deformation of the Earth's crust, the forces producing such deformation, and the geologic and structural features that result. The



Continental-continental convergence

constant motion of the plates causes stress in the brittle upper crust of the earth. These tectonic stresses build as the rocks are gradually deformed. The rock deformation, or strain, is stored in the rocks as elastic strain energy. When the strength of the rock is exceeded, rupture occurs along a fault. The rocks on opposite sides of the fault slide past each other as they spring back into a relaxed position. The strain energy is released partly as heat and partly as elastic waves called seismic waves. The passage of these seismic waves produces the ground shaking in earthquakes.

Faults are more likely to produce future earthquakes if they have rapid rates of movement, have had recent earthquakes along them, experience greater total displacements, or are aligned so that movement can relieve the accumulating tectonic stresses. Geologists classify faults by their relative hazards. "Active" faults, which represent the highest hazard, are those that have ruptured to the ground surface during the Holocene period (about the last 11,000 years). In contrast, "potentially active" faults are those that displaced layers of rock from the Quaternary period (the last 1.8 million years). Determining if a fault is "active" or "potentially active" depends on geologic evidence which may not be available for every fault.

Shaking

The amount of energy released during an earthquake is usually expressed as a magnitude and is measured directly from the earthquake as recorded on seismographs. An earthquake's magnitude is expressed in whole numbers and decimals (e.g., 6.8). Seismologists have developed several magnitude scales. One of the first was the Richter Scale, developed in 1932 by Dr. Charles F. Richter of the California Institute of Technology. The most used scale today is the Moment Magnitude (Mw) Scale. Moment magnitude is related to the total area of the fault that ruptured and the amount of offset (displacement) across the fault. It is a more uniform measure of the energy released during an earthquake.

The other commonly used measure of earthquake severity is intensity. Intensity is an expression of the amount of shaking at any given location on the ground surface. In general, it decreases with distance from the source of an earthquake, but it may be increased or decreased by several factors.

The Modified Mercalli Intensity Scale and Corresponding Richter Scale Magnitudes

Shaking intensity is often described using the Modified Mercalli Intensity Scale, which rates an earthquake's effects based on human observation. While an earthquake has only one magnitude it may have many intensity values, which will generally decrease with distance from the epicenter. Table 3.6 below lists the Mercalli Scale's various intensity levels.

Table 3.6: Modified Mercalli Intensity Scale

Mercalli Intensity		Description
I	Instrumental	Detected only by a seismograph
II	Feeble	Noticed by sensitive people

Table 3.6: Modified Mercalli Intensity Scale

Mercalli Intensity		Description
III	Slight	Like the vibrations due to a passing truck
IV	Moderate	Felt by people while walking; rocking of loose objects, including standing vehicles
V	Rather Strong	Felt generally; most sleepers are awakened and bells ring
VI	Strong	Trees sway and all suspended objects swing; damage by over-turning and falling of loose objects
VII	Very Strong	General alarm; walls crack; plaster falls
VIII	Destructive	Car drivers seriously disturbed; masonry fissured; chimneys fall; poor constructed buildings damaged
IX	Ruinous	Some houses collapse where ground begins to crack, and pipes break
X	Disastrous	Ground cracks badly; many buildings destroyed and railway lines bent; landslides on steep slopes
XI	Very disastrous	Few buildings remain standing; bridges destroyed; all services (railway, pipes, and cables) out of action; great landslides and floods
XII	Catastrophic	Total Destruction; objects thrown into air; ground rises and falls in waves

Amplification of Seismic Shaking

Although seismic waves radiate from their source like ripples on a pond, the radiation is not uniform due to the complex nature of an earthquake rupture, the different paths the waves follow through the earth, and the different rock and soil layers near the earth's surface. Large earthquakes begin to rupture at their hypocenter deep in the earth and the fault ruptures outward from that point. Because the speed of an earthquake rupture on a fault is likened the speed of seismic waves, waves closer to the epicenter can be compounded by waves from farther along the rupture, creating a pulse of very strong seismic waves that moves along the fault in the direction of the fault rupture. Seismic waves may also be modified as they travel through the earth's crust.

As seismic waves approach the ground surface, they commonly enter areas of loose soils where the waves travel more slowly. As the waves slow down, their amplitude increases, resulting in larger waves with frequencies that are more likely to damage structures. Waves can also be trapped within soft sediments between the ground surface and deep, hard basement rocks, their destructive energy multiplying as they bounce back and forth, producing much greater shaking at the ground surface.

Ground Failure

Fissuring, settlement, and permanent horizontal and vertical shifting of the ground often accompany large earthquakes. Although not as pervasive or as costly as the shaking itself, these ground failures can significantly increase damage and under certain circumstances can be the dominant cause of damage.

Fault Rupture

The sudden sliding of one part of the earth's crust past other releases the vast store of elastic energy in the rocks as an earthquake. The resulting fracture is known as a fault, while the sliding movement of earth on either side of a fault is called fault rupture. Fault rupture begins below the ground surface at the earthquake hypocenter, typically between three and ten miles below the ground surface in California. If an earthquake is large enough, the fault rupture will travel all the way to the ground surface, severely damaging structures built across its path.

Liquefaction

In addition to the primary fault rupture that occurs right along a fault during an earthquake, the ground many miles away can also fail during the intense shaking. One common type of failure occurs when soft, water-saturated soil settles, causing the water to eject sediment particles as it works its way to the ground surface. This phenomenon, known as liquefaction, turns the soil into a fluid, causing it to lose the ability to support buildings and other structures. Areas susceptible to liquefaction include places where sandy sediments have been deposited by rivers along their course or by wave action along beaches.

Landslides

Landslides typically occur as mass land movement along mountainous regions where a weakened layer of earth separates itself from stable underlying material. Oftentimes, landslides are triggers by ground shaking which cause mass movement of soil. Landslides can include mudflows, mudslides, debris flows, rock falls, rockslides, debris avalanches, debris slides, and slump-earth flows. The two major types of slides are rotational and translational slides. In a rotational slide, a weakened layer ruptures concavely upward and the slide movement is downward and outward. In a translational slide, the weakened material moves along a planar surface with no rotation. Other forms of landslides include falls, block slides, and toppling. Falls are defined as abrupt detachment and movement of rocks or boulders which result in free-falling, bouncing, or rolling debris. Block slides are a type of translational slide where a weakened layer consists of a single or multiple units that move as a coherent mass. Toppling failures are seen as a forward motion of earth along a pivotal point due either to gravity or by water or ice in cracks of the mass.

3.3.2 Earthquake Hazard History

To indicate the potential for an earthquake event, Table 3.7 lists all significant recorded earthquakes in Southern California and the associated magnitudes (excerpted from the Southern California Earthquake Data Center):

Table 3.7: Southern California Historical Earthquakes

Under Magnitude 4.5 | Magnitude 4.5 - 5.4 | Magnitude 5.5 - 6.4 | Magnitude 6.5 to 7.4 | Magnitude > 7.5

Magnitude	Year	Earthquake Name
Magnitude 5.5 - 6.4	1796	LA Basin Earthquake
Magnitude 6.5 to 7.4	1800	San Diego Earthquake
Magnitude 6.5 to 7.4	1812	Wrightwood (or San Juan Capistrano) Earthquake
Magnitude 6.5 to 7.4	1812	Santa Barbara Earthquake
Magnitude 6.5 to 7.4	1852	Volcano Lake Earthquake
Magnitude 5.5 - 6.4	1855	Los Angeles Region Earthquake
Magnitude > 7.5	1857	Fort Tejon Earthquake
Magnitude 5.5 - 6.4	1858	San Bernardino Earthquake
Magnitude 5.5 - 6.4	1862	San Diego Earthquake
Magnitude > 7.5	1872	Owens Valley Earthquake
Magnitude 5.5 - 6.4	1881	Parkfield Earthquake
Magnitude 5.5 - 6.4	1883	Santa Barbara Channel Earthquake
Magnitude 6.5 to 7.4	1890	San Jacinto or Elsinore Fault Region Earthquake
Magnitude 6.5 to 7.4	1892	San Jacinto or Elsinore Fault Region Earthquake
Magnitude 6.5 to 7.4	1892	Laguna Salada Earthquake
Magnitude > 7.5	1892	Imperial Valley Earthquake
Magnitude 5.5 - 6.4	1899	Cajon Pass Earthquake
Magnitude 6.5 to 7.4	1899	San Jacinto Earthquake
Magnitude 5.5 - 6.4	1901	Parkfield Earthquake
Magnitude 5.5 - 6.4	1906	Imperial Valley Earthquake
Magnitude 5.5 - 6.4	1908	Death Valley Region Earthquake
Magnitude 5.5 - 6.4	1910	Elsinore Earthquake
Magnitude 5.5 - 6.4	1915	Imperial Valley Earthquake
Magnitude 5.5 - 6.4	1916	South of Death Valley Earthquake
Magnitude 6.5 to 7.4	1918	San Jacinto Earthquake
Magnitude 5.5 - 6.4	1922	Parkfield Earthquake
Magnitude 5.5 - 6.4	1923	North San Jacinto Fault Earthquake
Magnitude 5.5 - 6.4	1925	Santa Barbara Earthquake
Magnitude 6.5 to 7.4	1927	Lompoc Earthquake

Table 3.7: Southern California Historical Earthquakes

Under Magnitude 4.5 | Magnitude 4.5 - 5.4 | Magnitude 5.5 - 6.4 | Magnitude 6.5 to 7.4 | Magnitude > 7.5

Magnitude	Year	Earthquake Name
Magnitude 5.5 - 6.4	1933	Long Beach Earthquake
Magnitude 5.5 - 6.4	1934	Parkfield Earthquake
Magnitude 5.5 - 6.4	1937	San Jacinto Fault ("Terwilliger Valley") Earthquake
Magnitude 6.5 to 7.4	1940	Imperial Valley Earthquake
Magnitude 5.5 - 6.4	1941	Santa Barbara Earthquake
Magnitude 4.5 - 5.4	1941	Torrance-Gardena Earthquakes
Magnitude 6.5 to 7.4	1942	Fish Creek Mountains Earthquake
Magnitude 5.5 - 6.4	1946	Walker Pass Earthquake
Magnitude 6.5 to 7.4	1947	Manix Earthquake
Magnitude 5.5 - 6.4	1948	Desert Hot Springs Earthquake
Magnitude > 7.5	1952	Kern County Earthquake
Magnitude 5.5 - 6.4	1952	Bakersfield Earthquake
Magnitude 5.5 - 6.4	1954	San Jacinto Fault Earthquake
Under magnitude 4.5	1966	Imperial Fault Earthquake
Magnitude 5.5 - 6.4	1966	Parkfield Earthquake
Magnitude 6.5 to 7.4	1968	Borrego Mountain Earthquake
Magnitude 4.5 - 5.4	1970	Lytle Creek Earthquake
Magnitude 6.5 to 7.4	1971	San Fernando (Sylmar) Earthquake
Magnitude 4.5 - 5.4	1973	Point Mugu Earthquake
Magnitude 4.5 - 5.4	1975	Galway Lake Earthquake
Magnitude 4.5 - 5.4	1978	Santa Barbara Earthquake
Magnitude 4.5 - 5.4	1979	Malibu Earthquake
Magnitude 5.5 - 6.4	1979	Imperial Valley Earthquake
Magnitude 5.5 - 6.4	1980	Whitewash Earthquake
Magnitude 4.5 - 5.4	1982	"Anza Gap" Earthquake
Magnitude 5.5 - 6.4	1986	North Palm Springs Earthquake
Magnitude 4.5 - 5.4	1986	Oceanside Earthquake
Magnitude 6.5 to 7.4	1987	Elmore Ranch/Superstition Hills Earthquakes
Magnitude 5.5 - 6.4	1987	Whittier Narrows Earthquake
Magnitude 4.5 - 5.4	1988	Tejon Ranch Earthquake
Magnitude 4.5 - 5.4	1988	Upland Earthquake
Magnitude 4.5 - 5.4	1988	Pasadena Earthquake
Magnitude 4.5 - 5.4	1989	Malibu Earthquake

Table 3.7: Southern California Historical Earthquakes

Under Magnitude 4.5 | Magnitude 4.5 - 5.4 | Magnitude 5.5 - 6.4 | Magnitude 6.5 to 7.4 | Magnitude > 7.5

Magnitude	Year	Earthquake Name
Magnitude 4.5 - 5.4	1989	Newport Beach Earthquake
Magnitude 4.5 - 5.4	1989	Montebello Earthquake
Magnitude 4.5 - 5.4	1990	Upland Earthquake
Magnitude 5.5 - 6.4	1991	Sierra Madre Earthquake
Magnitude 5.5 - 6.4	1992	Joshua Tree Earthquake
Magnitude 6.5 to 7.4	1992	Landers Earthquake
Magnitude 5.5 - 6.4	1992	Big Bear Earthquake
Magnitude 5.5 - 6.4	1992	Mojave (Garlock) Earthquake
Magnitude 4.5 - 5.4	1993	Wheeler Ridge Earthquake
Magnitude 6.5 to 7.4	1994	Northridge Earthquake
Magnitude 5.5 - 6.4	1995	Ridgecrest Earthquakes
Magnitude 4.5 - 5.4	1996	Coso Earthquake
Magnitude 4.5 - 5.4	1997	Calico Earthquake
Magnitude 4.5 - 5.4	1998	Coso Earthquakes
Magnitude 4.5 - 5.4	1998	Crafton Hills (Redlands) Earthquake
Magnitude 4.5 - 5.4	1998	San Bernardino Earthquake
Magnitude 4.5 - 5.4	1998	Whiskey Springs (Big Bear City) Earthquake
Magnitude 6.5 to 7.4	1999	Hector Mine Earthquake
Under magnitude 4.5	2001	West Hollywood Earthquake
Magnitude 4.5 - 5.4	2001	Anza Earthquake
Magnitude 5.5 - 6.4	2002	Laguna Salad Earthquake
Magnitude 6.5 to 7.4	2003	San Simeon Earthquake
Magnitude 4.5 - 5.4	2005	Mettler Earthquake
Magnitude 4.5 - 5.4	2008	Chino Hills Earthquake
Magnitude 4.5 - 5.4	2009	Inglewood Earthquake
Magnitude <4.5 - 5.4	2009	Bombay Beach Earthquake Swarm (250+)
Magnitude 5.5 - 6.4	2009	Baja California Earthquake
Magnitude 6.5 to 7.4	2010	Sierra El Mayor Earthquake
Magnitude 4.5 - 5.4	2011	Calexico Earthquake
Magnitude 4.5 - 5.4	2012	Brawley Earthquake
Magnitude 4.5 - 5.4	2012	Westmoreland Earthquake
Magnitude 4.5 - 5.4	2013	Isla Vista Earthquake
Magnitude 4.5 - 5.4	2014	Brea Earthquake

Table 3.7: Southern California Historical Earthquakes

Under Magnitude 4.5	Magnitude 4.5 - 5.4	Magnitude 5.5 - 6.4
Magnitude 6.5 to 7.4	Magnitude > 7.5	

Magnitude	Year	Earthquake Name
Magnitude 4.5 - 5.4	2015	Stovepipe Wells Earthquake
Magnitude 4.5 - 5.4	2016	San Jacinto Earthquake
Magnitude 6.5 to 7.4	2019	Ridgecrest Earthquake
Magnitude 5.5 - 6.4	2020	Lone Pine

Southern California Historic Earthquakes

Even if the epicenter of a major earthquake is not located directly within EMWD's service area, the aftershock associated with that earthquake can cause significant damage. The hazards associated with aftershock earthquakes are the same as mainshock earthquakes and may cause significant damage and disruption. The primary difference between these two types of earthquakes is that aftershock earthquakes are categorized by the following two guidelines. First, it must occur within one rupture length of the mainshock rupture surface, or alternatively, within an "aftershock zone" based upon early aftershock activity and defined by seismologists. Second, it must occur within that designated area before the seismicity rate in that area returns to its "background", meaning pre-mainshock, level. Figure 3.1 from the Southern California Earthquake Data Center details the locations and magnitudes for historic Southern California earthquakes.

In addition to significant earthquakes, the relative seismicity of the region indicates the potential for future significant and catastrophic earthquakes.

Figure 3.1: Southern California Historic Earthquakes Map

3.3.3 Earthquake Probability, Frequency, and Magnitude

The Taskforce ranked earthquake as the greatest threat to EMWD due to its proximity to the San Andreas Fault, Elsinore Fault and San Jacinto Fault Zones. All three are classified as right-lateral strike-slip faults capable of producing 6.5 to 8.0 magnitude earthquakes, with lengths of 1,200 km. 180 km and 210 km, respectively. Figure 3.2 on the following page illustrates the faults located in and around EMWD service area.

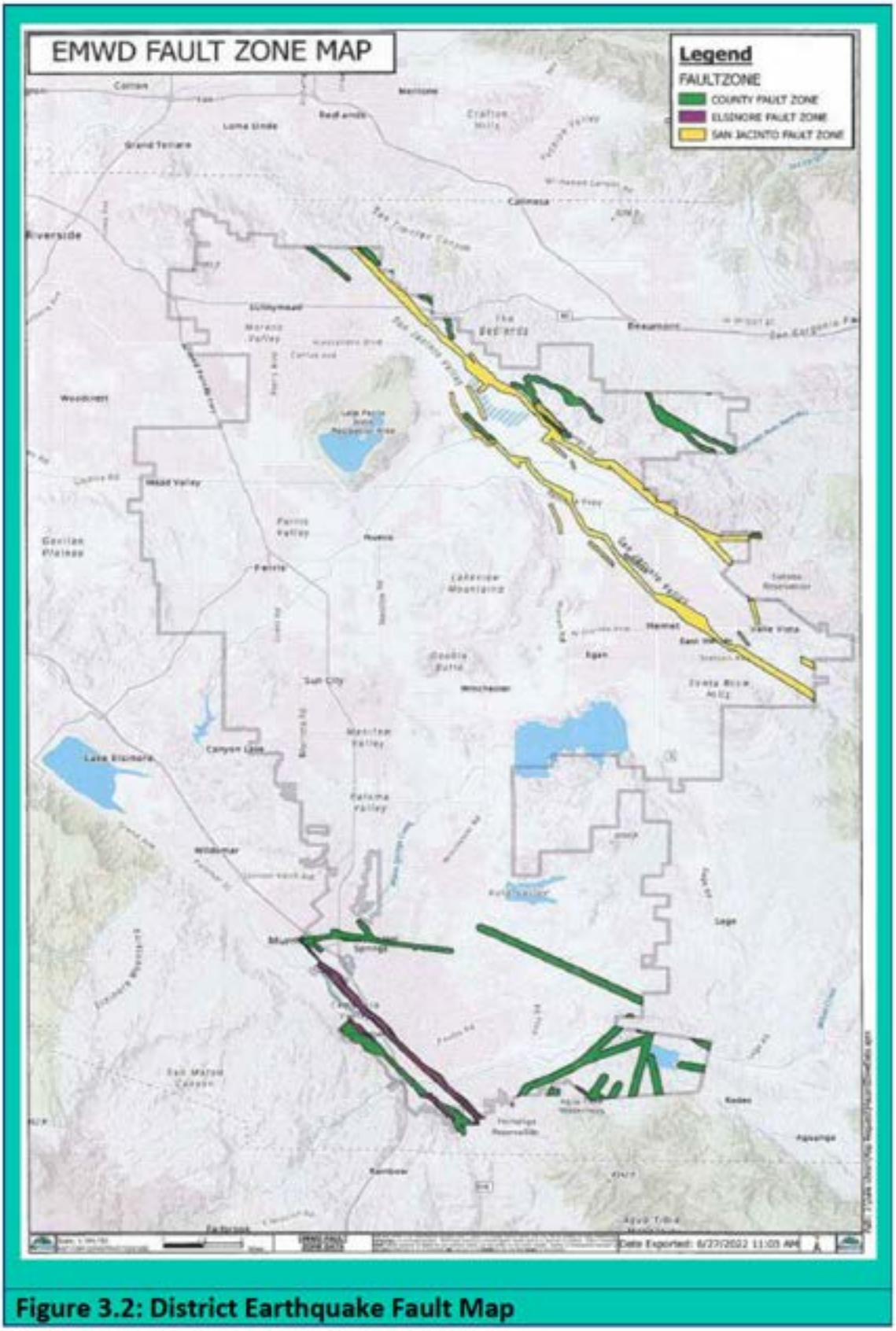


Figure 3.2: District Earthquake Fault Map

Fault Zones

As stated above, there are several faults and fault zones throughout Riverside County, some traversing EMWD's service area. After reviewing maps of the Riverside County area, it was determined the three faults mentioned about, the San Andreas; Elsinore; San Jacinto Faults, were perceived as the most likely to impact the service area. A major earthquake along any of these faults could result in substantial casualties and damage resulting from collapsed buildings, damaged roads and bridges, fires, flooding, and other threats to life and property. There may still be unmapped faults throughout the Inland Area that could also affect EMWD. Figure 3.2 shows the local earthquake faults in and around EMWD's service area. In addition, Tables 3.8 through 3.10 give fault specific information for local faults that could significantly affect EMWD.

The San Andreas Fault

Table 3.8: San Andreas Fault Information

Type of fault:	Right-lateral strike-slip
Length:	1,200 kilometers (km)
Nearby Communities:	San Jose, San Mateo, Palo Alto, South San Francisco, and Sunnyvale
Last Major Rupture:	June, 1838 (Northern segment), January 9, 1857 (Mojave segment); April 18, 1906 (Northern segment), October 17, 1989 (Northern segment)
Slip rate:	2-2.5 inches/year
Interval Between Major Ruptures:	Recurrence intervals vary greatly from under 20 years (at Parkfield only) to over 300 years
Probable Magnitudes:	6.8 to 8.0
Distance and Direction from EMWD:	Approximately 13 miles northeast

This fault marks the boundary between the North American and Pacific tectonic plates and is capable of producing earthquakes in the magnitude 8+ range. It has been scientifically determined through a carbon dating process, over the past 1,400 to 1,500 years, a major earthquake on this fault has occurred approximately every 140 to 150 years. In the northern section of the San Andreas, there is a slightly lower potential for a great earthquake within the next few decades as compared to the southern San Andreas section. This is because less than 100 years have passed since the great 1906 San Francisco Earthquake. However, moderately sized, potentially damaging earthquakes could occur on this fault at any time near EMWD.

The Elsinore Fault

Table 3.9: Elsinore Fault Information

Type of fault:	Right-lateral strike-slip
Length:	180 kilometers (km)
Nearby Communities:	Temecula, Lake Elsinore, Julian
Last Major Rupture:	May 15, 1910; Magnitude 6 – no surface rupture found
Slip rate:	4.0 mm/year
Interval Between Major Ruptures:	Roughly 250 years
Probable Magnitudes:	6.5 - 7.5
Distance and Direction from EMWD:	Runs through the southern point of EMWD service area near Temecula

The Elsinore Fault Zone is one of the largest in southern California but historically has been one of the quietest according to the Southern California Earthquake Data Center. The southeastern extension of the Elsinore fault zone, the Laguna Salada fault, ruptured in 1892 in a magnitude 7 earthquake, but the main trace of the Elsinore fault zone has only seen one historical event greater than magnitude 5.2 -- the earthquake of 1910, a magnitude 6 shock near Temescal Valley, which produced no known surface rupture and did little damage. Still, should a large rupture occur on this fault, the impacts on EMWD could be substantial.

The San Jacinto Fault

Table 3.10: San Jacinto Fault Information

Type of fault:	Right-lateral strike-slip, minor right-reverse
Length:	210 kilometers (km)
Nearby Communities:	Lytle Creek, San Bernardino, Loma Linda, San Jacinto, Hemet, Anza, Borrego Springs, and Ocotillo Wells
Last Major Rupture:	April 9, 1968 M6.5 on the Coyote Creek Segment
Slip rate:	Between 7 and 17 mm/year
Interval Between Major Ruptures:	Between 100 and 300 years, per segment
Probable Magnitudes:	6.5 to 7.5
Distance and Direction from EMWD:	Traverses EMWD from Hemet to Moreno Valley parallel the northeast border of the service area.

The San Jacinto fault zone is large and, like other large fault zones, breaks off into many individual fault strands which have their own identities. The Glen Helen Fault, Lytle Creek Fault, Casa Loma Fault, and the Clark Fault are all strands of the San Jacinto Fault. In 1954, a magnitude 6.4 ruptured of the Clark Fault segment 30 miles south of Indio, California, southwest of EMWD's service area. Shaking was felt as far as Ventura County and Baja California and damage was reported in Los Angeles, San Bernardino, and San Diego. Based on the interval between major ruptures, the probability of a large earthquake along the San Jacinto Fault in the next 50 years is relatively low.

Peak Ground Acceleration

The Peak Ground Acceleration (PGA) mapping represents peak horizontal acceleration of the ground on firm-rock conditions. The approach of representing peak horizontal ground acceleration on firm-rock is a common and widely used method of showing ground accelerations. The development of probabilistic acceleration maps is a result of three types of basic input parameters:

- Attenuation of ground shaking with distance from the earthquake source;
- Frequency of earthquakes within an area or region, termed recurrence; and
- The character and extent of regions and faults that generate earthquakes.

According to the following Probabilistic Seismic Hazard Map, EMWD is located in an area that will experience a PGA ranging from 0.46g to 1.0g with 2% exceedance in 50 years (0.0004 annual probability).

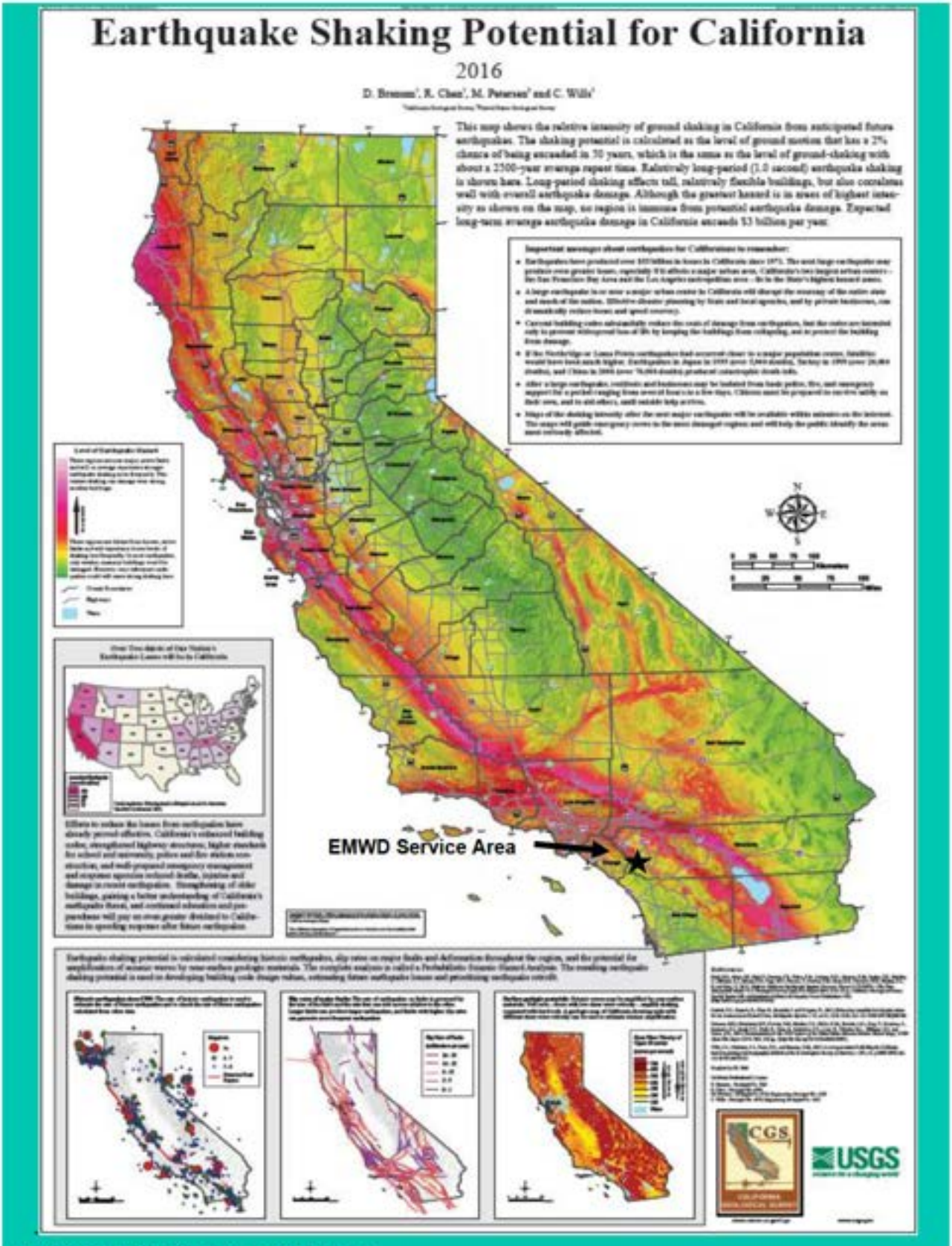


Figure 3.3: 2016 California Hazard potential

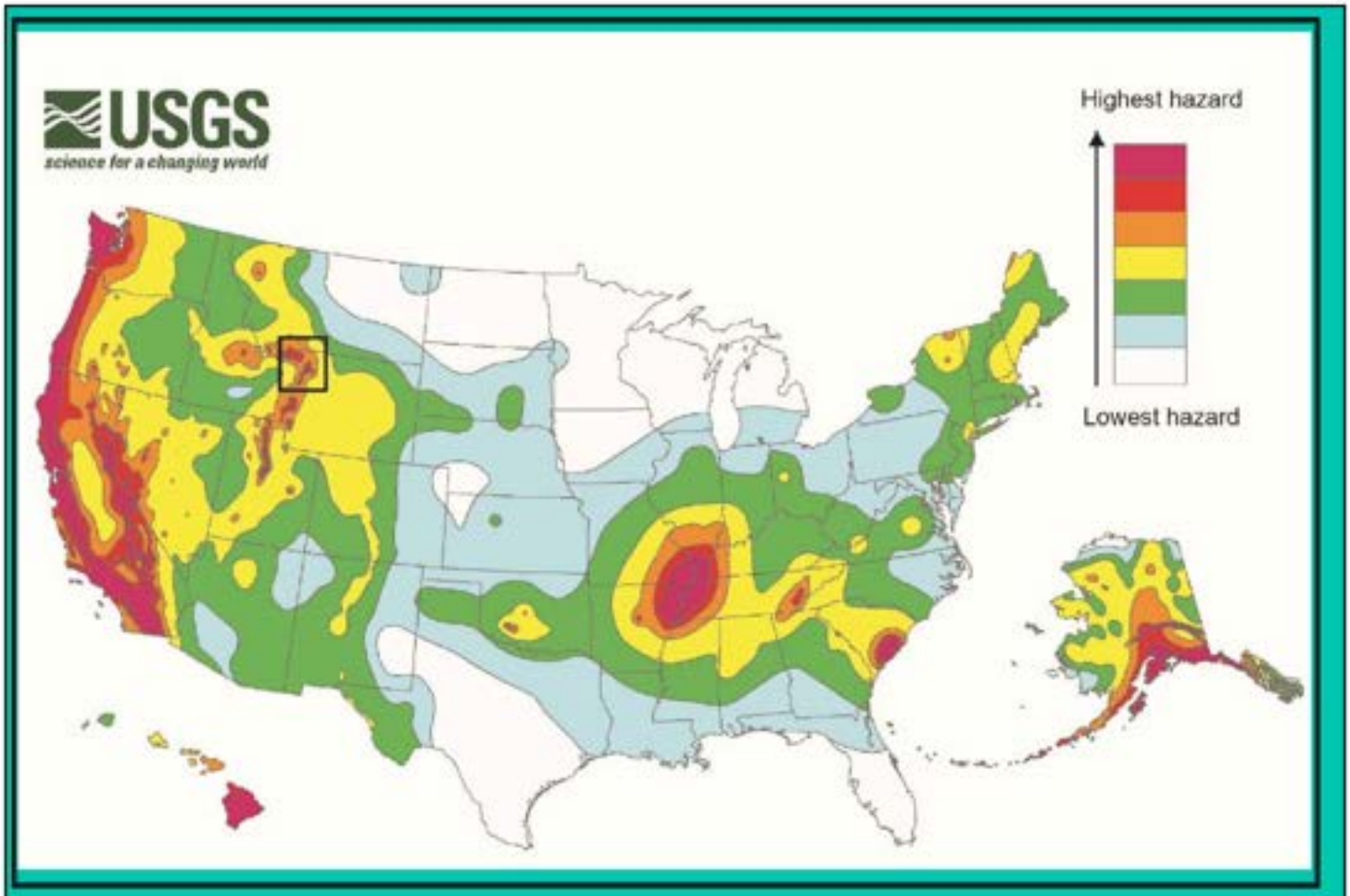


Figure 3.4: 2014 District Peak Ground Acceleration

According to table 3.11 provided by the United States Geographic Survey (USGS), this PGA value is typically associated with an approximate 6.2 – 6.9 magnitude earthquake. Thus, there is a 0.0004% annual possibility of a 6.2 – 7.0 magnitude earthquake affecting EMWD.

Table 3.11: Mercalli Intensity and Corresponding Peak Ground Acceleration

Mercalli Intensity	Richter Intensity	Acceleration (%g)	Velocity (cm/s)	Perceived Shaking	Potential Damage
I	3.5	< 0.17	< 0.1	Not Felt	None
II-III	4.2 – 4.3	0.17 - 1.4	0.1 - 1.1	Weak	None
IV	4.8		1.1 - 3.4	Light	None
V	4.9 – 5.4	3.9 - 9.2	3.4 - 8.1	Moderate	Very light
VI	5.5 – 6.0	9.2 - 18	8.1 - 16	Strong	Light
VII	6.1	18 - 34	16 - 31	Very Strong	Moderate
VIII	6.2	34 - 65	31 - 60	Severe	Moderate to Heavy
IX	6.9	65 - 124	60 - 116	Violent	Heavy
X+	> 7.0	> 124	> 116	Extreme	Very Heavy

3.4 Extreme Weather Hazard Profile

Extreme Weather Risk Assessment Summary	
Risk Rank Category: Moderately High	
Probability/Frequency:	Frequent event - occurs more than once a year
Consequence/Severity:	Moderate building damage, minor loss of lifelines (less than 12 hours), lost time injury but no disability
Vulnerability:	Localized damage area, minor secondary impacts, delayed hazard onset
Location:	The Taskforce did not note any specific locations more prone to different forms of extreme weather. It was assumed all areas of EMWD service area were equally vulnerable.
Hazard Risk Rank Score:	36
Team Comments:	The Taskforce combined previously separated hazard including extreme heat, severe storm, windstorm, and tornado to form the extreme weather hazard

3.4.1 Extreme Weather Hazard Information and Background

Extreme weather can be defined as unexpected, unusual, unpredictable severe or unseasonable weather at the extremes of what has been recorded for the region. Extreme weather can take many forms, but the following subsections will attempt to describe the scenarios the Taskforce perceived as most capable of impacting EMWD.

Extreme Heat

A heat wave is a prolonged period of abnormally hot weather which may be accompanied by excessive humidity. The term is relative to the normal weather patterns experienced in a given area. Therefore, temperatures from a relatively hotter climate which are considered normal can be called a heat wave in a cooler area if they are outside the normal pattern for that region. The term is applied both to routine weather variations and to extraordinary heat spells which might occur only once a century. In the U.S., a heat wave is generally defined as at least three consecutive days with temperatures of 90 degrees Fahrenheit (32 Celsius) or more.

Some of the major risks extreme heat poses to public health are as follows:

- Heatstroke - Considered a medical emergency, heatstroke can often be fatal. It occurs when the body's response to heat stress are insufficient to prevent a substantial rise in the body's core temperature. While no standard diagnosis exists, a medical heatstroke condition is usually

diagnosed when the body's temperature exceeds 105°F due to environmental temperatures. Rapid cooling is necessary to prevent death, with an average fatality rate of 15 percent, even with treatment.

- Heat Exhaustion - While much less serious than heatstroke, heat exhaustion victims may complain of dizziness, weakness, or fatigue. Body temperatures may be normal or slightly/moderately elevated.
- Heat Syncope - This refers to sudden loss of consciousness and is typically associated with people exercising who are not acclimated to warm temperatures.
- Heat Cramps – These may occur in people unaccustomed to exercising in the heat and generally ceases to be a problem after acclimatization.

In addition to affecting people, severe heat places significant stress on plants and animals. The effects of severe heat on landscaping and local growth can lead to increased vulnerability for fire.

The heat index, also known as the apparent temperature, is a way to describe what the temperature feels like to the human body. The heat index combines the effects of heat and humidity to use as a guide to potential determining danger. Figure 3.5 below is the heat stress index based on the apparent temperature:

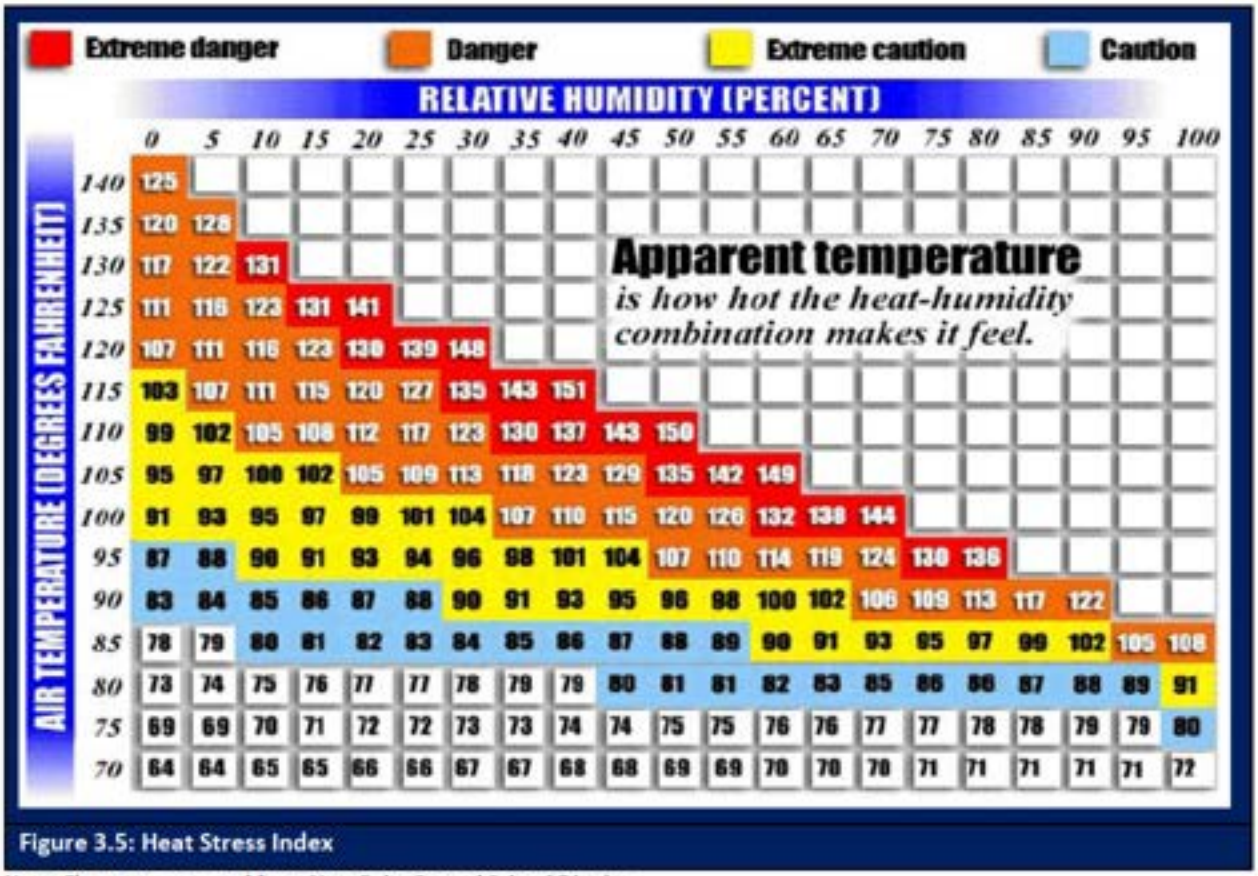


Figure 3.5: Heat Stress Index

Note: Figure was sourced from New Paltz Central School District - http://www.newpaltz.k12.ny.us/cms/lib/NY01000611/Centricity/Domain/122/AP/HeatIndex.html

There is a theory claiming increased usage of fossil fuels for transportation and electricity, along with increased deforestation has led to overloading of the atmosphere with greenhouse gases such as carbon dioxide (CO2) along with the destruction of the protective ozone layer above Earth's atmosphere. According to this theory, these heat trapping emissions act as a blanket and increase the overall atmospheric temperature, thus warming the planet and resulting in heat waves.

Lightning/Thunderstorms

Lightning is a powerful natural electrostatic discharge produced during a thunderstorm. This abrupt electric discharge is accompanied by the emission of visible light. The electric current passing through the discharge channels rapidly heats and expands the air, producing acoustic shock waves (thunder) in the atmosphere.

All lightning originates around 15,000 to 25,000 feet above sea level when raindrops are carried upward until some drops convert to ice. A cloud-to-ground lightning flash originates in this region, moving downward in 50-yard sections called step ladders. Eventually, the charge encounters something on the ground that conducts electricity. At this point the circuit is complete and the charge is lowered from the cloud to the ground. The return stroke is a flow of charge, which produces visible light.

Lightning causes thunder. The bright light of the lightning flash caused by the return stroke represents a great deal of energy. This energy heats the air in the channel to above 50,000 degrees Fahrenheit in only a few millionths of a second. The air that is now heated to such a high temperature has no time to expand, resulting in very high pressure. The high-pressure air then expands outward into the surrounding air, compressing it and causing a disturbance that propagates in all directions away from the stroke. The disturbance is a shock wave for the first 10 yards, after which it becomes an ordinary sound wave, or thunder.

According to statistics from the National Oceanic and Atmospheric Administration (NOAA), approximately 330 people in the U.S. are struck by lightning annually with 10% of strikes resulting in a fatality. Lightning injuries result from three factors: electrical damage, intense heat, and the associated mechanical energy. The following list provides the lightning hazards to the general population:

- Direct strike
- 'Splash' from nearby objects struck

- Ground strikes near victims which are capable of generating potential differences up to several thousand volts-per-foot, depending upon the ground composition at the strike location.
- Electromagnetic pulse (EMP) produced from strikes - especially during positive lightning discharges.

Windstorm

Wind can be described as the flow of air caused by a difference in air pressure within the Earth's atmosphere. Differences in atmospheric pressure causes air to move from high pressure areas to lower. The greater the difference between the two pressure areas, the greater the speed at which the air moves from one pressure area to the other. Strong winds have been known to cause minor property damage and in extreme cases destroy large structures in its path.

The Beaufort Scale is widely used to describe wind speeds based on observed ocean conditions. Since its most recent modification in the 1940's, the scale utilizes a seventeen-level system ranging from no air flow to winds that exceed 140 miles per hour (mph) (120 knots) and describe wind speeds in empirical terms. According to this scale, air speeds during a windstorm usually fall between 65 mph (56 knots) and 72 mph (63 knots). Winds of this speed and greater have been known to cause tornado-like property damage and inhibit utility, telecommunications, and transportation systems in and around EMWD.

Severe windstorms represent a significant risk to life and property in the region by creating conditions that disrupt essential systems such as public utilities, telecommunications, and transportation routes. High winds can and do occasionally cause tornado-like damage to local homes and businesses. High winds can have destructive impacts, especially to trees, power lines, and utility services.

Based on local history, most incidents of high wind in EMWD are the result of the Santa Ana wind conditions. While high impact wind incidents are not frequent in the area, significant Santa Ana Wind events and sporadic tornado activity have been known to negatively impact the region.

Tornado:

A tornado is a violent rotating column of air that reaches to the ground from a storm cloud in the shape of a condensation funnel created and maintained by strong inflowing winds. The spinning winds can attain extremely high speeds which provide great risk to property and life at the ground and in the air. When the humidity is high enough, the tornado funnel is made visible by the circulation of condensed water vapor in its outer sheath, but although the flow of air is inward and upward, the cloud within the low-pressure funnel actually extends downward from the cloud base.

Tornadoes are spawned when there is warm, moist air near the ground, cool air aloft, and winds that speed up and change direction. An obstruction, such as a house, in the path of the wind causes it to change direction. This change increases pressure on parts of the house, and the combination of increased pressures and fluctuating wind speeds creates stresses that frequently cause structural failures.

Life and Property:

Based on the history of the region, windstorm events can be expected, perhaps annually, across widespread areas of the region which can be adversely impacted during a windstorm event. Structures with weak reinforcement are susceptible to damage. Wind pressure can create a direct and frontal assault on a structure, pushing walls, doors, and windows inward. Conversely, passing currents can create lift suction forces that pull building components and surfaces outward. With extreme wind forces, the roof or entire building can fail causing considerable damage.

Debris carried by extreme winds can directly contribute to loss of life and indirectly to the failure of protective building envelopes, siding, or walls. When severe windstorms strike a community, downed trees, power lines, and damaged property can be major hindrances to emergency response and disaster recovery.

3.4.2 Extreme Weather Hazard History

Extreme Heat

To indicate the potential for an extreme temperature incident, Table 3.12 below, excerpted from the NOAA, lists recent extreme heat events that have resulted in damage in Riverside County:

Table 3.12: Extreme Heat Damage in Riverside County

Date	Injuries	Fatalities	Property Damage
8/2/1997	0	5	-
6/22/2001	2	1	-
7/23/2002	0	1	-
7/10/2005	0	1	-
7/21/2006	27	16	-
9/1/2007	2	4	-
6/20/2008	0	0	-
5/12/2012	-	1	-
6/20/2016	2	-	-

Heat-Wave of 2006

In mid-July 2006, a severe heat wave hit the U.S, southern California in particular. Temperatures soared to 115 degrees Fahrenheit and by the end of July there were over 160 heat-related deaths in California. The death-toll was so great, several County coroners were back logged. A report from the California Climate Change Center published in 2009 determined that the heat caused two to three time the number of deaths estimated by coroner in at least seven counties. It was documented as one of the worst heat waves on record in the previous 57 years.

Severe Storm

To indicate the potential for a severe storm event, Table 3.13 lists an excerpt of large-scale severe storms extracted from the NOAA's National Climatic Data Center. The table includes lightning, thunderstorms, hail, fog, winter weather, and wind scenarios with some of these storms resulting in extensive regional damage. This list is not comprehensive since severe storms are an annual event regularly causing minor damages and economic disruption (e.g. closed roads, fallen power lines, etc.). The table includes lightning, thunderstorms, hail, fog, winter weather, and wind that have resulted in extensive regional damage.

Table 3.13: Historical Severe Weather Damage in Riverside County

Date	Injuries	Fatalities	Property Damage	Description
9/5/1991	0	0	-	Hail
8/13/1994	0	0	$10,000	Lightning
11/29/1997	20	0	-	Fog
9/21/1999	0	0	-	Hail/Heavy Wind
1/12/2000	1	0	$20,000	Fog
3/3/2000	3	0	-	Lightning
3/4/2000	13	3	$50,000	Winter Storm
2/1/2001	31	0	$150,000	Winter Storm
9/30/2001	0	0	$50,000	Hail/Heavy Wind
2/25/2003	24	0	$250,000	Heavy Rain
7/30/2003	0	1	-	Lightning
11/21/2004	0	0	$250,000	Heavy Snow
1/7/2005	0	0	$20,000,000	Heavy Rain
3/10/2006	7	1	$160,000	Winter Storm

Date	Injuries	Fatalities	Property Damage	Description
8/30/2008	2	0	-	Hail
6/3/2009	0	0	$105,000	Lightning
1/21/2010	1	0	$100,000	Heavy Rain
10/19/2010	0	0	$8,000	Lightning
9/3/2013	0	0	$1,000	Hail
12/30/2014	0	0	$3,000	Heavy Snow
9/15/2015	0	0	$10,000	Heavy Rain
11/3/2016	0	0	$25,000	Thunderstorm Wind
8/1/2017	0	0	Unknown	Flash flooding
2/14/2019	0	0	$$	Major atmospheric river/ Flash flooding
3/12/2020	0	0	Unknown	Flash flooding
1/28-29/2021	8	1	Unknown	Winter storm and atmospheric river
12/31/22 – 1/1/23	0	0	Unknown	Storm

Note: Property Damage may not have been reported for each incident

El Nino

El Nino is a recurring weather pattern associated with a band of warm ocean water that develops in the central and east-central equatorial Pacific. It occurs every two to five years and brings significant precipitation to California in the form of rain and strong winds which increase vulnerability to flooding and mudslides, particularly for areas affected by wildfires. Additionally, after several years of drought, many of the trees throughout the State have been weakened as a result of limited water supply. Coupled with strong winds resulting from an El Nino phenomenon, these trees can pose danger to people and property. EMWD service area has many trees which may have been impacted by the recent reduction in precipitation and have the potential of being impacted by an El Nino event.

Windstorm

To indicate the potential for a destructive windstorm, Table 3.14 lists an excerpt of large-scale severe windstorms in the vicinity of EMWD extracted from the NOAA National Climatic Data Center.

Table 3.14: Major Windstorms in the Inland Area

Date	Location and Damage
November 25, 1996	Strong surface high pressure over the Great Basin produced strong Santa Ana winds across Southern California. Gusts up to 98 mph were felt and numerous tress and power lines were blown down.
December 15, 1996	Strong Santa Ana winds toppled trees and electric poles, smashed windows, blew out signs, and knocked out power to tens of thousands across scattered areas of Southern California. Gusts were reported up to 111 mph in some areas. Two fatalities were reported in San Bernardino County.
December 21, 1999	Strong Santa Ana winds caused widespread power outages, toppled trees, and knocked down powerlines. $15,000 in property damage were reported to local communities. Gusts were recorded between 35 and 53 mph.
January 5, 2003	High winds were recorded with speeds up to 90 mph. Falling trees and power poles were reported and at least 60 communities were affected. $100,000 dollars were reported in conjunction with this event.
November 11, 2004	A cold low pressure system called an inside slider hit Southern California from the north with gusts up to 85 mph bringing heavy snow and thunderstorms. Snow was reported in areas as low at 1000 feet in Temecula, Elsinore, and Murrieta.
March 2, 2008	An upper trough of low pressure caused gusts of winds between 60 and 80 mph. The wind overturned big rigs and broke tree branches in the Inland Empire.
January 21, 2012	Gusts between 75 and 100 mph blew through the Inland Empire knocking down trees and costing Riverside County $600,000 in damages.
December 21, 2016	Reports of multiple northeast wind gusts in excess of 58 mph with a peak of 67 mph over the region bringing with it moderate rainfall. Minor flooding was reported in some areas.

Santa Ana Winds

The Santa Ana Winds are a seasonal phenomenon in Southern California occurring between October and March. According to the California Climate Change Center, these dry winds occur when cold air moves southward into the Great Basin between the Sierra Nevada Mountain Range and the Southern California Coastal Range. The cold air mass is characterized by unusually high pressure near the land surface. As the wind moves through canyons and passes, the wind accelerates to speeds of 40 mph (35 knots) with gusts up to about 70 mph (60 knots). This phenomenon has occurred with regularity since at least the mid-1800s. While generally overlooked, Santa Ana winds have been reported to have caused property damage, power outages, road blockages from fallen trees, increased fire threats, and even loss of life from the result of a secondary impact.

3.4.3 Extreme Weather Hazard Frequency and Magnitude

Given the severe weather history in EMWD, severe weather events, including extreme heat, rain, thunderstorms, and windstorms are very likely to continue to occur. There are no known tendencies for any area within EMWD to experience more severe weather scenarios than other areas, so the Taskforce assumed equal vulnerability for all portions of the service area.

Overall, the probability and frequency of heat hazards in the service area are characterized by a heat index using temperature and humidity readings. According to the heat index, EMWD has a relatively high probability of experiencing extremely high apparent temperatures. Figure 3.6 illustrates mean departures from national average temperatures for June – August 2016. As seen below, most of the service area tended to be about six degrees above the average for the area. While 2016 was an especially hot year, this map serves as a case in point that EMWD experiences periods of higher-than-normal temperatures.

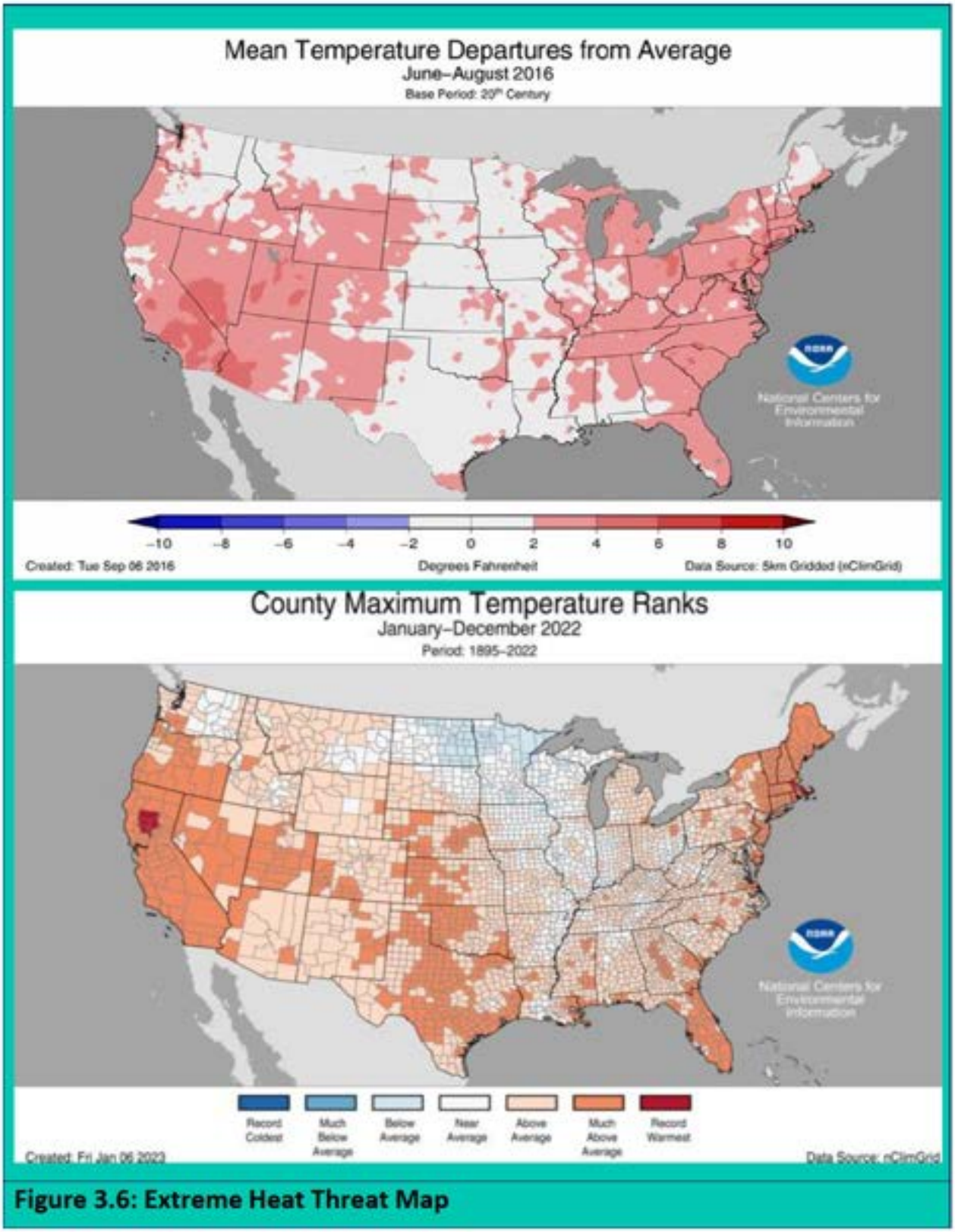


Figure 3.6: Extreme Heat Threat Map

Weather Tables 3.15 through 3.17 and Figures 3.7 through 3.9 portray the averages for several areas within EMWD's service area based on information obtained from NOAA. The cities included are Temecula, Moreno Valley, and Hemet. These areas are clear examples of the weather extremes within the service area.

Table 3.15: Weather Historic Averages for the City of Temecula

Month	Average Low	Average High	Average Precipitation	Average Snow
January	25°F	88°F	2.8"	0"
February	34°F	89°F	3.0"	0"
March	34°F	85°F	0.8"	0"
April	38°F	97°F	0.6"	0"
May	45°F	89°F	0.2"	0"
June	49°F	93°F	0.0"	0"
July	53°F	94°F	0.0"	0"
August	50°F	92°F	0.1"	0"
September	45°F	93°F	0.1"	0"
October	34°F	95°F	0.4"	0"
November	30°F	94°F	0.8"	0"
December	29°F	82°F	1.8"	0"

Figure 3.7: City of Temecula Average Wind Speeds

Table 3.16: Weather Historic Averages for the City of Hemet

Month	Average Low	Average High	Average Precipitation	Average Snow
January	19°F	82°F	2.1"	0"
February	27°F	86°F	1.9"	0"
March	26°F	91°F	0.7"	0"
April	30°F	98°F	0.4"	0"
May	39°F	102°F	0.2"	0"
June	46°F	108°F	0.0"	0"
July	50°F	113°F	0.0"	0"
August	53°F	109°F	0.0"	0"
September	45°F	108°F	0.1"	0"
October	37°F	100°F	0.2"	0"
November	30°F	92°F	0.3"	0"
December	25°F	84°F	1.5"	0"

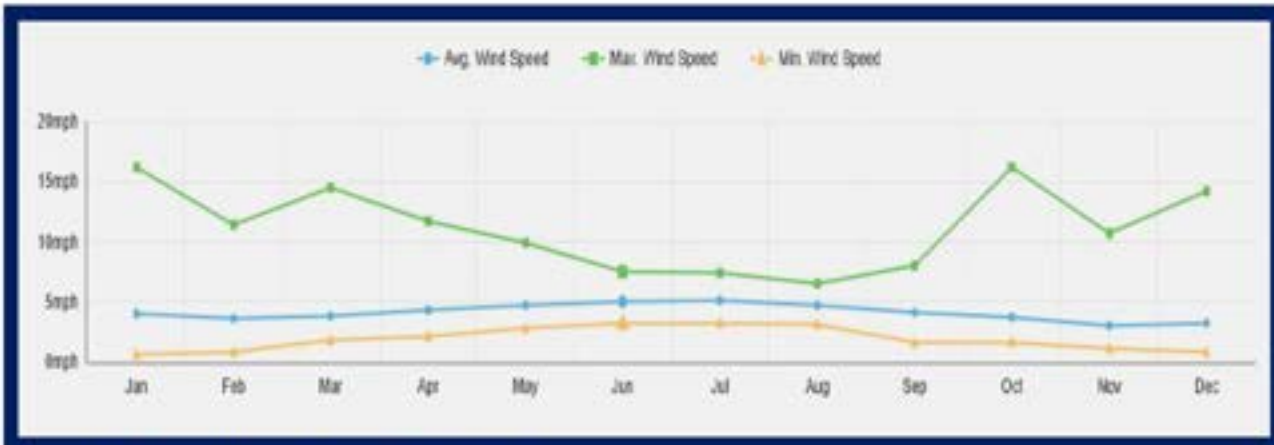


Figure 3.8: City of Hemet Average Wind Speeds

Table 3.17: Weather Historic Averages for the City of Moreno Valley

Month	Average Low	Average High	Average Precipitation	Average Snow
January	19°F	82°F	2.1"	0
February	27°F	86°F	1.9"	0
March	26°F	91°F	0.7"	0
April	30°F	98°F	0.4"	0
May	29°F	102°F	0.2"	0
June	46°F	108°F	0.0"	0
July	50°F	113°F	0.0"	0
August	53°F	109°F	0.0"	0
September	45°F	108°F	0.1"	0
October	37°F	100°F	0.2"	0
November	30°F	92°F	0.3"	0
December	25°F	84°F	1.5"	0

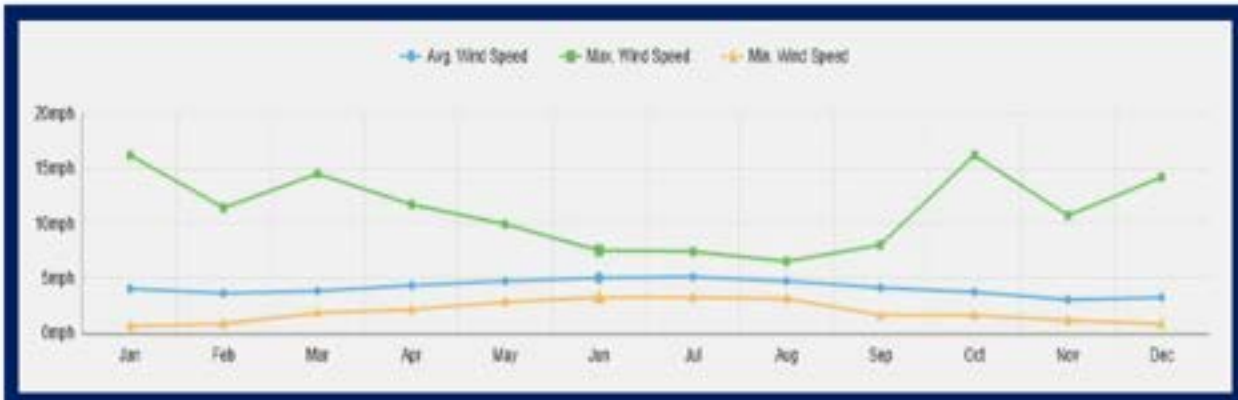


Figure 3.9: City of Moreno Valley Average Wind Speeds

3.5 Flood & Dam Release Hazard Profile

Flood & Dam Release Risk Assessment Summary	
Risk Rank Category: Moderately High	
Probability/Frequency:	Infrequent event - occurs between once every 8 years and once every 50 years (inclusive)
Consequence/Severity:	Moderate building damage, lifeline loss (less than 24 hours), severe injury or disability
Vulnerability:	Moderate damage area, moderate secondary impacts, moderate warning time
Location:	Areas most vulnerable to flooding would be in dam inundation zones and any low-lying plain area. FEMA NFIP maps are included later in this section to demonstrate locations which are more susceptible to flood.
Hazard Risk Rank Score:	32
Team Comments:	The Taskforce combined flood and dam/reservoir failure hazards from the 2017 Plan as the potential impacts are similar for EMWD.

3.5.1 Flood & Dam Release Hazard Information and Background

According to the FEMAs National Flood Insurance Program, flood is the most common type of disaster including both man-made and naturally occurring incidents in the U.S. Land along rivers, streams, lakeshores, and coastlines are particularly susceptible to flooding.

The primary responsibility of the local governments during widespread flooding is to protect public safety. The second responsibility is protection of the environment followed by property such as highways, streets, bridges, and structure protection.

The types and causes of flooding that can occur within EMWD are the result of:

- Heavy rains,
- Flood control channel overflow,
- High water table,
- Coastal, tropical, and/or hurricane storms, and
- Accidents such as reservoir leaks and water main breaks.

What are Floods?

A flood occurs any time a body of water rises to cover what is usually dry land. Floods have many causes, including heavy rains, spring snowmelt, coastal storms, and dam or levee failure. When flooding occurs, affected areas may sustain damage to structures and personal property, as well as severe damage to the environment in the form of soil erosion and deforestation and damage to utilities and transportation systems.

Floods can take several hours to days to develop; the following flood characterization designates the amount of time for response:

- **Flood Watch** – a flood is possible in the area.
- **Flood Warning** – flooding is already occurring or will occur soon in the area.
- **Flash Flood Watch** – a flash flood is possible in the area. Seek immediate shelter or higher ground.
- **Flash Flood Warning** – flooding is already occurring or will occur soon in the area. Flash floods can occur without warning, during heavy rain in mountainous regions ensure that precautions and flash flood warnings are adhered to.

Alluvial Fan Flooding

Alluvial fan flooding occurs in the steep arid or semiarid mountains found throughout California. Alluvial fans are fan-shaped deposits of eroded rock and soil carried out of mountains and into valley floors by landslides, mudslides, mudflows, and surface runoff. At the beginning of the valley, alluvial fans are steep and narrow with boulders and other course material. The deposited material becomes increasingly fine as the gradient decreases and the material, mainly gravels, sand and mud, spreads.

When rain falls, runoff from the canyon walls flows as a high-velocity sheet that channels into rivulets, and then to natural drainage courses. The rapidly moving water often carries large boulders and other material from the watershed depositing them into runoff channels, blocking the flow of water. Floodwater then spills out onto the fan, with each event finding a new channel that soon fills up with deposits and overflows. Flooding in alluvial fans often can cause greater damage than clear-water flooding.

Flash Flooding

A flash flood is a rapid flooding of low-lying areas, rivers, and streams that is caused by the intense rainfall associated with a thunderstorm, or multiple thunderstorms. Flash floods also occur when a man-made structure, such as a dam, collapses. Flash flooding occurs when the ground under a storm becomes saturated with water so quickly that it cannot be absorbed. The runoff collects in low-lying areas and flows rapidly downhill. As a result, anything in its path is suddenly in rising water. A typical flash flood

begins with a slow-moving thunderstorm. This usually takes longer to move out of the affected areas and causes the area to endure a greater amount of rainfall for a longer period. In addition, a thunderstorm may pass over an affected area repeatedly, dumping even more rainfall.

The heavy rainfall associated with these storm systems contributes to urban flooding in several ways. Primarily, heavy rainfall will often overwhelm the capacity of the conventional drainage system made up of storm drains, catch basins, sewers, and additional natural mechanisms for storm-water management. These systems typically cannot handle more than one or two inches of rainfall per hour before they begin to backup and overflow. This amount is further diminished if the storm drains, and other components of the storm-water management system, have not been adequately maintained, are clogged with debris such as trash or natural waste, or are old and in a state of disrepair. Heavy rainfall, combined with storm-water runoff, can cause local waterways to rise and overflow their banks.

Dam Release

Dams are an important part of the infrastructure in the U.S., providing avenues for water supply, flood control, irrigation, hydroelectric power, and recreation. According to FloodSmart.gov (The official website of the National Flood Insurance Program [NFIP]), there are more than 84,000 dams in the National Inventory. It should be noted only one-third of them are owned by the government with the remainder being under private ownership. While it is the dam owner's sole responsibility for safety and liability, the States have regulatory responsibility for about 90% of the dams. With more than a third of our nation's dams being more than 50 years old, 14,000 of them pose a "high" or significant" hazard to life and property if failure occurs.

According to the FEMA website, dam failures are generally caused by one or a combination of the following reasons.

Over topping

The Association of State Dam Safety Officials (ASDSO) reports 34% of all U.S. dam failures are due to over topping because of inadequate spillway design, debris blockage of spillways, or settlement of the dam crest. Over topping occurs when primary and emergency spillways are not sufficient to pass floodwaters and the excess runs over the top of the dam. The overflow can erode the embankment, weakening the dam wall and potentially cause a full dam failure. While the City has not experienced the repercussions of a major dam release, the Sweet water Dam failure that occurred on January 27, 1916, is an example of a release in Southern California that was the result of over topping. After experiencing a long period of drought, the area received more

than thirty-nine inches of rain. As a result, more than 200 bridges we washed out, entire communities were swept away, levees collapsed, and valleys were inundated. Should the Whittier-Narrows dam fail due to overtopping, this is likely the type of impact the city would encounter.

Acts of sabotage

Sabotage, or deliberate actions aimed at disrupting normal dam operations, can occur for many reasons. Like an act of terrorism or public demonstration, acts of sabotage can be motivated by a number of factors; political, socio-economic, and religious are a just a few. Often, they occur suddenly, and without warning. However, according to the Stanford University National Performance of Dams Program (NPDP), sabotage and vandalism have been the cause of the fewest dam failures between the years 1975 and 2001. Therefore, while the city is vulnerable to acts of sabotage, it is unlikely to occur.

Structural failure of materials used in dam construction

According to the NPDP, dam failure due to structural deficiencies are only marginally more common the acts of sabotage. Due to state regulations for dam construction and maintenance, failures due to inadequate structural integrity are rare.

According to FEMA, causes of dam failure in this category may include:

- Movement and/or failure of the foundation supporting the dam,
- Settlement and cracking of concrete or embankment dams,
- Piping and internal erosion of the soil in embankment dams, and
- Inadequate maintenance and upkeep.

One of the most notable dam incidents in California history involved the Baldwin Hills Dam. The dam was constructed in Baldwin Hills, Los Angeles between 1947 and 1951 to provide drinking water for West Los Angeles residents. The dam was constructed on an active fault line which many of the geologists involved in its planning considered unstable for a reservoir. On December 14, 1963, a small crack developed in the embankment which widened to a 75-foot gash resulting in the release of 292 million gallons of water. Five people were killed, sixty five homes were destroyed, and 210 home and apartments were damaged.

As mentioned previously, causes in this category are considered minor as they comprise a minute fraction of historic dam failures in the U.S. Figure 3.10 shows the causes of recorded dam failures between the years 2010 and 2019.

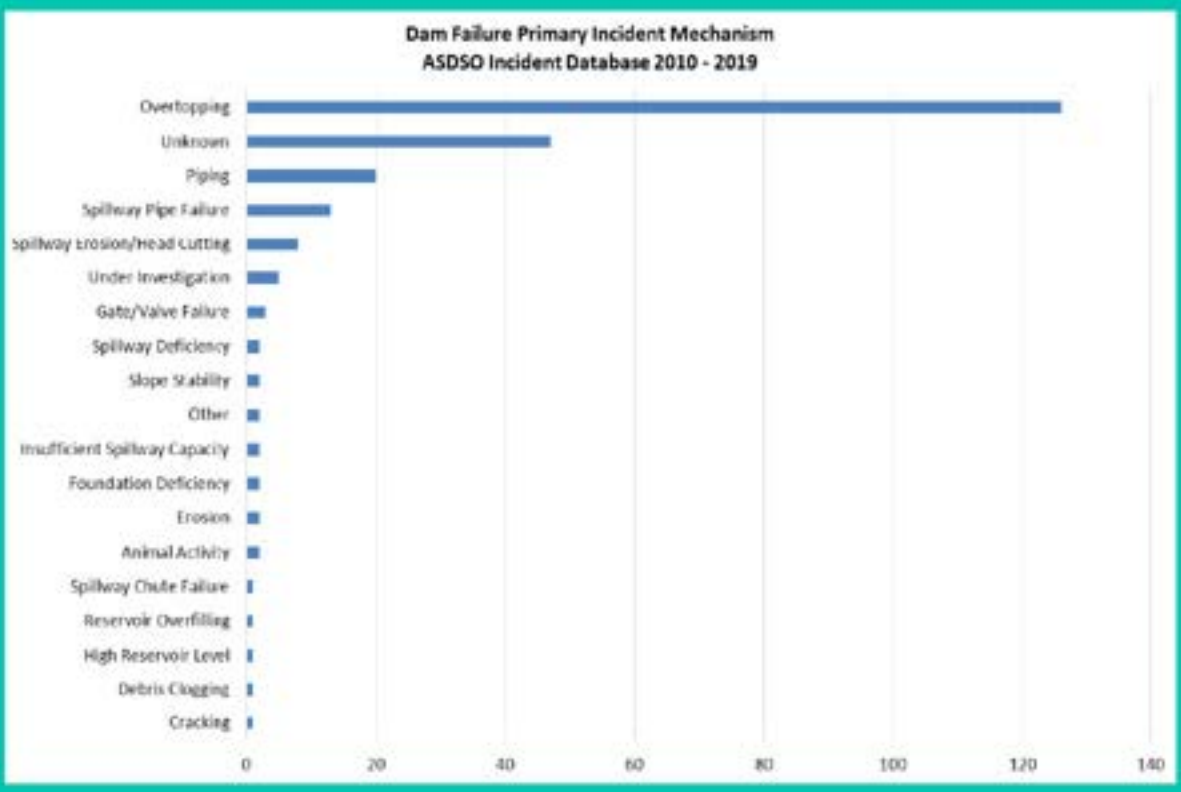


Figure 3.10: Causes of Dam Failure

3.5.2 Flood & Dam Release Hazard History

Riverside County and EMWD has experienced several large flood events. The subsections below illustrate a few of these occurrences to serve as a case in point of the extent of EMWD vulnerability to flood as reported by the USGS and NOAA.

1993 Flood Event

From January 6 to February 28, 1993, a series of storms produced 20 to 40 inches of rain over the southern California coastal and mountain regions and over 52 inches at some precipitation gages in the San Bernardino Mountains according to NOAA. These storms were driven by a regional atmospheric low-pressure system off the coast of northern California and Oregon.

The most severe flood event of the January – February 1993 storms occurred on January 16th in the Murrieta Creek floodplain in Temecula. Flood flows at the USGS Murrieta Creek stream flow gaging station (near Temecula) overtopped the gage house and the recorded stage was the maximum for the 68 years of record, exceeding the previous (February 21, 1980) record by more than 3 feet.

Maximums of record were also recorded on the Santa Margarita River near Temecula and on other smaller streams within the Santa Margarita River watershed. Extensive flooding occurred along the Santa Margarita River where it passes through Camp Pendleton, the U.S. Marine Corps base near the mouth of the river. The floodwaters spread over the broad, flat floodplain on the base and deposited large quantities of sediment and debris. The Santa Margarita River stream flow gaging station at Ysidora was damaged as the debris-laden river washed out the bridge. The estimated discharge of 44,000 cubic feet per second (cfs) exceeded the maximum discharge for the 68 years of record (33,600 cfs on February 16, 1927) by 34 percent.

December 2010 Storms and Flooding

In the span of one week, a series of mid–December storms in rapid succession produced record-setting rain and snowfall. The first rains and snow hit California on December 16th and subsequent periods of heavy rains continued almost unabated for a week with heavy snowfall in the Sierra Nevada Mountains according to NOAA. The storm areas of the heavier precipitation gradually shifted from northern California southward with each successive wave, punctuated by a final day of heavy rains, thunderstorms, and snow at the higher elevations of southern California and Nevada on December 22, 2010 when a cold upper trough shifted inland from the Pacific and brought an abrupt and welcome end to the wet pattern.

The Riverside County Flood Control Storm Center and Storm Patrols were activated December 21st - 22nd to monitor facilities, receive complaints and respond to problem areas as necessary. The Riverside County Flood Control Hydrologic Data Collection Section created a summary chart for the maximum precipitation gauges reported and the corresponding return frequencies for the different durations. The Temecula gauge reading showed a one day max of 5" and the 8-day total rain for the storms ranged from 3.79" to 13.14" at various locations across the county. The frequencies corresponding to six of these gages reached or exceeded the 100-year flood. Two regional flood control facilities were damaged during the storms with costs estimated at $2 million for restoration repairs. Several other regional facilities reached their capacity and one dam in the City of Riverside had a few inches of water flowing over the spillway.

Table 3.18: Historical Flooding damage in Riverside County

Date	Injuries	Fatalities	Property Damage	Crop Damage	Type
8/9/1994	0	0	$3,000	-	Flash Flood
3/5/1995	0	0	-	$1,000,000	Flash Flood
3/6/1995	0	2	-	-	Flash Flood
2/23/1998	0	0	$8,200,000	$4,200,000	Flood
7/11/1999	0	0	$500,000	-	Flood

Date	Injuries	Fatalities	Property Damage	Crop Damage	Type
7/12/1999	4	1	$50,000	-	Urban Flood
3/8/2000	4	2	$60,000	-	Urban Flood
7/6/2001	0	0	$1,200,000	-	Flash Flood
9/4/2003	0	0	$100,000	-	Flash Flood
1/9/2005	0	0	$5,000,000	-	Flash Flood
1/14/2005	0	0	$10,000,000	-	Flood
9/4/2006	0	0	$100,000	-	Flash Flood
7/20/2008	1	0	$500,000	-	Flash Flood
12/13/2009	0	0	$100,000	-	Flash Flood
12/22/2010	0	1	-	-	Flash Flood
7/6/2011	0	0	$9,000	-	Flood

Historical Dam Failure Events

EMWD has never been impacted by a dam failure. However, there have been a total of 45 dam failures in California's history. Failures have occurred for a variety of reasons. According to the United States Bureau of Reclamation, overtopping accounts for 30 percent of all dam failures in the United States in the last 75 years. Other dams have failed due to specific shortcomings in the dam itself or an inadequate assessment of the surrounding geomorphologic characteristics. The first notable dam failure occurred in 1883 in Sierra County, while the most recent failure occurred in 1965. The greatest catastrophe relating to California dam failures was William Mulholland's infamous St. Francis Dam, which failed in 1928 and resulted in a major disaster. Because of this failure and the exposure to potential risk to the general populace from a number of water storage dams in California, the Legislature in 1929 enacted legislation providing for supervision over non-federal dams in the State. Before the enactment of this legislation, either the State Engineer or the State Railroad Commission exercised State supervision over dams. This supervision was limited in scope and extended to less than half of the dams in the State. Historically, Riverside County has not experienced any significant dam failure incidents, although there are several major dams in the County of both the earthen and steel reinforced concrete type.

Descriptions of the dams, their inundation impact on the County, and a delineation of response efforts are outlined in the 2015 Draft version of the Flood and Dam Inundation Plan, maintained by Riverside County Transportation and Land Management Agency.

Operational Area Jurisdictions Affected by Dam Failure

- Norco
- Eastvale
- Corona
- Lake Elsinore
- Wildomar
- Murrieta
- Temecula
- Perris
- Menifee
- Riverside
- Jurupa Valley
- Hemet
- Moreno Valley
- San Jacinto
- Various Portions of unincorporated areas in the West County

(EMWD is a service provider for those identified in red)

The statute enacted in 1929 provided for:

- examination and approval or repair of dams completed prior to the effective date of the statute, August 14, 1929,
- approval of plans and specifications, and supervision of construction of new dams, and of the enlargement, alteration, repair, or removal of existing dams, and
- supervision over maintenance and operation of all dams of jurisdictional size.

Overall, there have been at least 460 deaths from dam failures in California. These failures are outlined in Table 3.19.

Table 3:19: Dam Failure Events in California

Year Failed	Dam	Location	Cause of Failure/Deaths
1883	English	Sierra County	Dam crumbles to foundations, decay of timber used
1892	Long Valley Creek	San Jacinto	Heavy rains, dam carried away by flood
1895	The Angels	Calaveras County	Undetermined during flood, poor foundation/ 1 death reported
1896	Vernon Heights	Oakland	Shallow foundation
1898	Snake Ravine	Stanislaus County	Poor compaction
1905	Piedmont No.1	Oakland	Outlet pipe sheared off at core wall
1906	San Andreas	San Mateo County	Crack along axis
1912	Morena	San Diego	Overtopping
1916	Lower Otay	San Diego	Leakage and overtopping due to inadequate spillway
1918	Lake Hodges	San Diego	Cracks in pier
1963	Baldwin Hills	Los Angeles	Leak through embankment turned into washout/ 3 Deaths

Year Failed	Dam	Location	Cause of Failure/Deaths
1964	Hell Hole	Rubicon River	Failed during construction due to unprecedented rains
1965	Matilija	Ventura	Bad foundation and concrete disintegrating
1971	San Fernando	San Fernando	Quake caused slide in upstream slope that lowered the crest ~ 30' ; reservoir drawn down over 3 days.

Note: Information was taken from UC Davis Civil & Environmental Engineering Department

3.5.3 Flood & Dam/Reservoir Failure Hazard Frequency and Magnitude

According to the FEMA Flood Insurance Rate Map (FIRM) Data illustrated in the map on the following page, minor portions of EMWD service area are located in 100- and 500-year flood plains. The 100- and 500-year recurrence intervals indicate a 0.01 and 0.002 annual probability of a flooding event, respectively. However, most of the service area is located within an area either outside the designated flood zones, or in an area of undetermined.

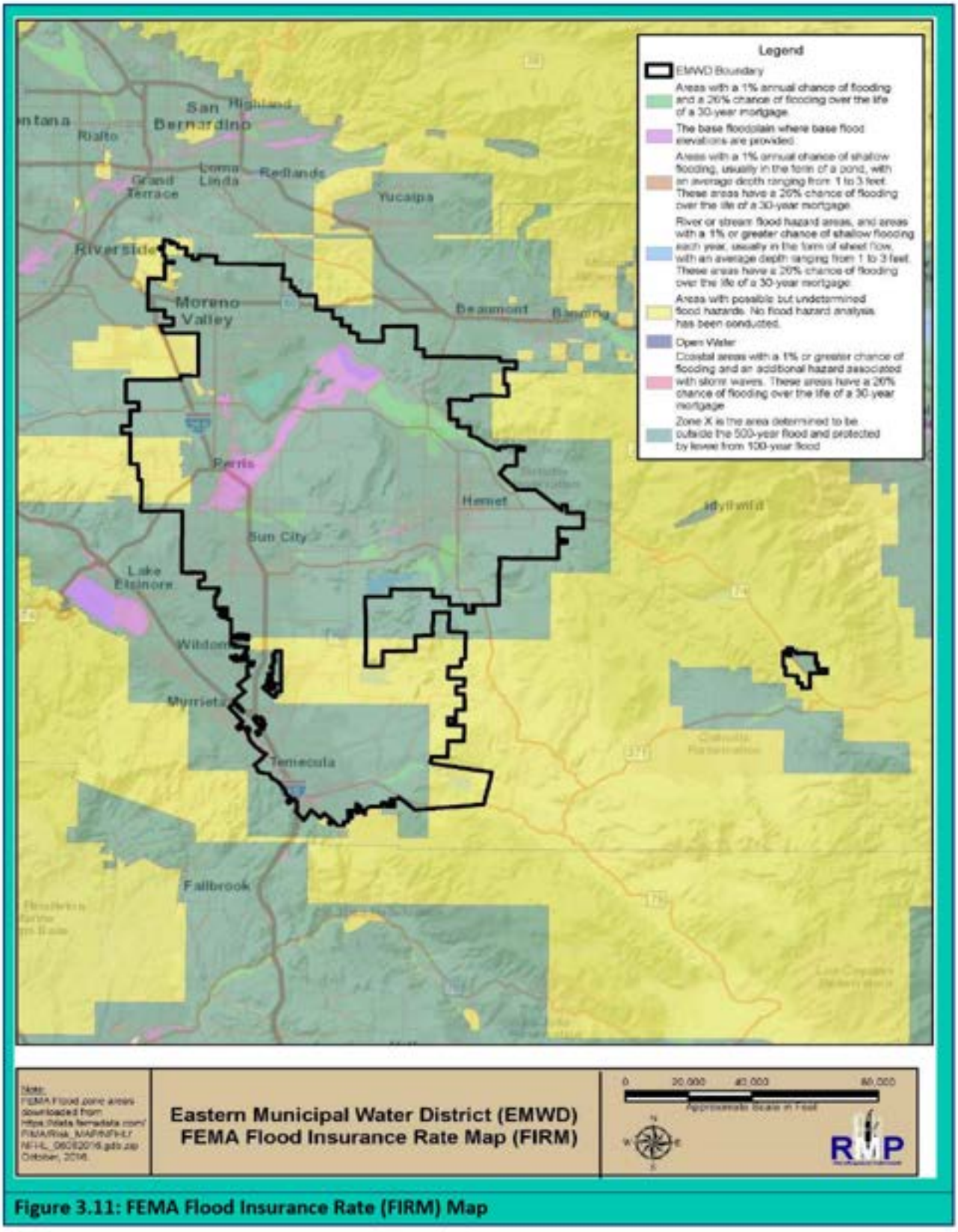


Figure 3.11: FEMA Flood Insurance Rate (FIRM) Map

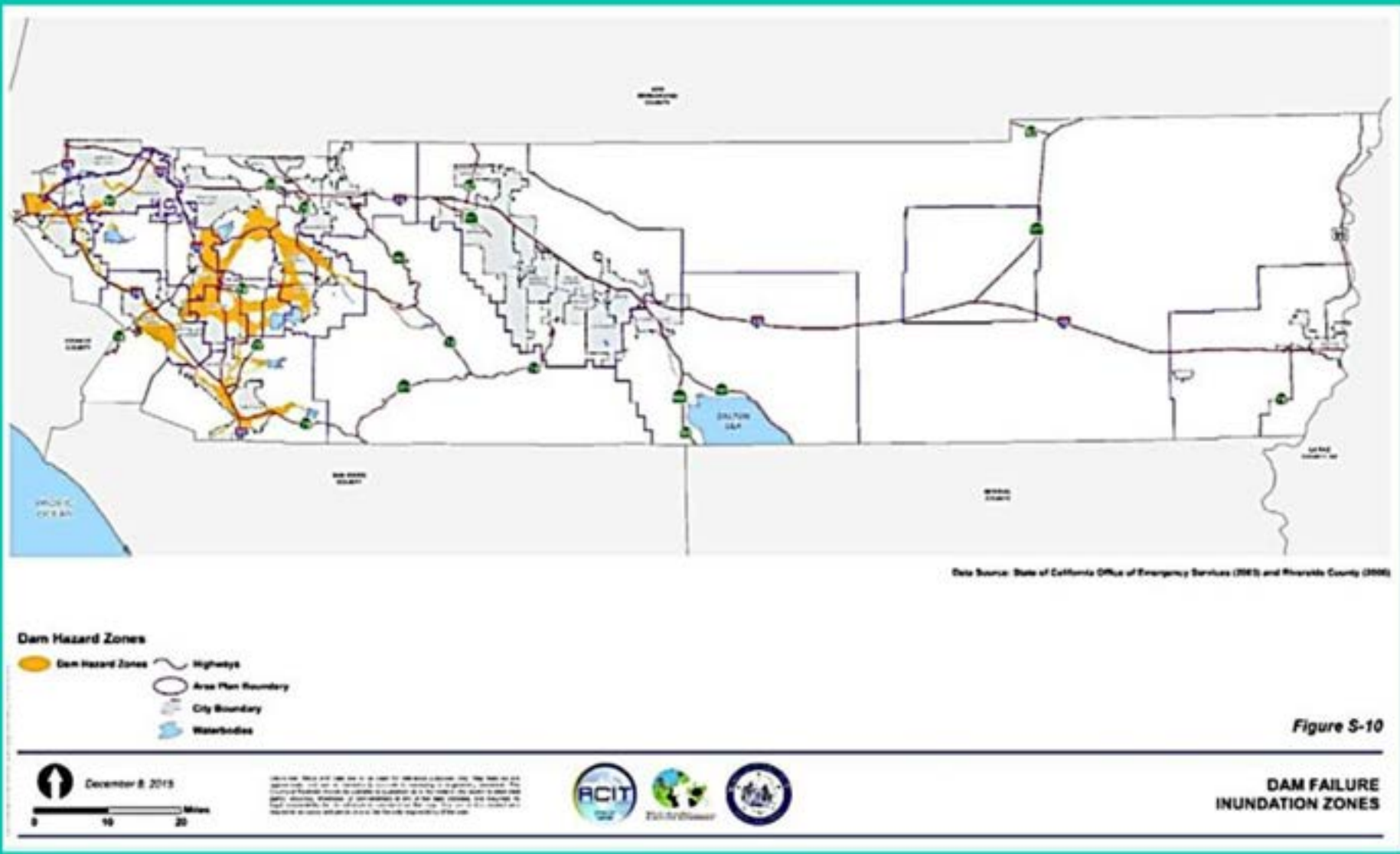


Figure 3.12: 2015 Riverside County Inundation Map

3.6 Infrastructure Failure Hazard Profile

Infrastructure Failure Risk Assessment Summary	
Risk Rank Category: Moderately High	
Probability/Frequency:	Frequent event - occurs more than once a year
Consequence/Severity:	Moderate building damage, lifeline loss (less than 24 hours), severe injury or disability
Vulnerability:	Localized damage area
Location:	District Assets which, if damaged, have the ability to interrupt water service can be found throughout the entire Service Area
Hazard Risk Rank Score:	32
Team Comments:	The Taskforce noted that small deviances from normal operations (i.e. pipeline failures) are a regular occurrence. However, when addressing Infrastructure failure, the team focused on large-scale scenarios such as a main break.

3.6.1 Infrastructure Failure Hazard Information and Background

Water from dams and reservoirs are supplied to Riverside County through distribution pipelines. Typical infrastructure of water supply system consists of:

- Water supply extraction and storage facilities including pump, dams and reservoirs
- Water conveyance facilities including aqueducts, canals and associated pumps
- Water treatment facilities
- Water distribution pipelines

According to the Centers of Disease Control and Prevention (CDC), the drinking water supplied to homes in the U.S. is some of the safest in the world. Water supply agencies use various methods of water treatment to ensure the drinking water provided to the public is safe for consumption. Common steps for water treatment used by water agencies are defined below. Failure of components in any of these steps can disrupt reliable supply of water to the public.

Sedimentation: In this step, larger and heavier dirt and contaminants settle to the bottom to be easily separated from water.

Filtration: This step removes the remaining contaminants left over from sedimentation process. This step can include process such as microfiltration, ultrafiltration, nanofiltration or reverse osmosis. These systems have proven very effective in removing bacteria, viruses, chemicals and other harmful contaminants.

Water softening system: This step is often used for drinking water supply systems. This involves ion exchange technology that removes calcium and magnesium ions in the water and replaces them with sodium ions. This process not only removes the hardness of the water, but can also remove heavy metals, radioactivity, nitrates, etc.

Distillation system: This step is also seen in the drinking water supply systems. This involves boiling and condensing water, which in turn removes many of the soluble and insoluble contaminants such as bacteria, viruses, heavy metals and chemical contaminants.

Disinfection: This is a crucial step in the water treatment system. Water that is treated, filtered and distilled may contain microorganisms that can affect humans. Water also needs to be protected from increased microorganism growth during distribution in the piping and distribution systems.

Causes of infrastructure failure:

With increasing population and the need for reliable water supply, infrastructure failure is a critical hazard that is commonly overlooked. One of the main causes of infrastructure failure in the water supply systems is aging in equipment such as pipelines, tunnels, dams, pumps, tanks and buried equipment. Protecting the pump and filtration systems from inlet sand and gravel is vital in extending the life of filter membranes and pump internals. Lack of regular maintenance, improper operation and corrosion over time can add to the loss of mechanical integrity. This can also lead to water quality issues and contaminated water supply to the public.

Infrastructure failure can also occur as a secondary impact during natural disasters such as earthquakes, landslides and flooding. Ground shaking and support damage can cause failure of piping and aqueducts which may result in disrupted water flow to the public. Failure history, probability, frequency and magnitude of hazards such as earthquakes, landslides and flooding are discussed in other sections.

3.6.2 Infrastructure Failure Hazard History

The most common infrastructure failure seen in California's water systems is water main failure. These failures have been known to result in property damage, disruption of traffic, loss of water, and high repair costs. Below are a few recent examples of main breaks in Riverside County to serve as a case in point of the kind of scenarios EMWD might face if it experiences an infrastructure failure event.

2014 Trey Avenue Water Main Break

On Saturday, December 20, 2014 around 2:30 AM, emergency responders arrived at the 8300 block of Trey Avenue in the City of Riverside to find a water main break had caused a large sinkhole and left 40 homes without water service. Later, a separate leak was found which added to the extent of the repair. Once the water was shut off, it took local City workers ten (10) hours to restore water service. Additional time and resources were needed to clear away mud from the street and nearby homes. Local authorities attributed the accident to the age of the pipes and increased vulnerability due to cold weather. Local reports did not release information about the cost of the repairs, but it is estimated the incident accrued tens of thousands in damage and repairs.

2015 Menifee Water Main Break

On Tuesday, April 28, 2015 a water main break flooded a Rite Aid Pharmacy on Newport and Murrieta roads in the City of Menifee, a retail customer within EMWD Service Area. Just after 1:00 PM, City emergency responders found "several hundreds, if not thousands of gallons of water flowing," according to Station 5 Engineer Paramedic Jeff Stout who participated in the response effort. Minor to moderate damage was reported to the pharmacy, but no other nearby properties were damaged. The blast from the break caused a 20-foot-wide sinkhole and a disruption in water service to several of the surrounding businesses and residences. Local business owners made recorded statements about the loss of business due to water service outages adding to overall cost of the event. Overall, the city reported a cost of $250,000 to repair the 24 inches of broken pipeline and 300 feet of warped asphalt.

3.6.3 Infrastructure Failure Hazard Frequency and Magnitude

Nationally, several organizations have been trying to raise awareness of the growing need for water infrastructure repairs and the growing cost of systems failures. The U.S. Environmental Protection Agency (EPA) reports that there are an estimated 240,000 water main breaks per year. Many of these breaks require millions of dollars for the replacement of worn piping and to repair residual damage to municipal and private property. According to the American Water Works Association, an estimated $1 trillion dollars is necessary to maintain and expand water service to meet demands over the next 25 years nationally.

EMWD has an extensive network of pipes throughout its service area that are susceptible to failure and can cause localized flooding of homes, disrupt traffic and businesses and at times create sinkholes. Other infrastructure failures such as pump failures and water filtration system failures can also disrupt water supply to public. However, these systems are designed with redundancy and are generally not expected to cause any major disruption to the public as the result of normal wear. Other infrastructure failures resulting from earthquakes, flooding and drought can compound to the hazards and are discussed in other sections.

3.7 Wildfire Hazard Profile

Wildfire Risk Assessment Summary	
Risk Rank Category: Moderately High	
Probability/Frequency:	Regular event - occurs between once a year and once every 7 years
Consequence/Severity:	Moderate building damage, minor loss of lifelines (less than 12 hours), lost time injury but no disability
Vulnerability:	Localized damage area, minor secondary impacts, delayed hazard onset
Location:	
Hazard Risk Rank Score:	27
Team Comments:	None

3.7.1 Wildfire Hazard Information and Background

A wildland fire is an uncontrolled fire spreading through vegetative fuels, exposing and possibly consuming structures. They often begin unnoticed, spread quickly, and are usually signaled by dense smoke that may fill the area for miles around. Wildfires can be human-caused through acts such as arson or campfires, or can be caused by natural events such as lightning. Fires are typically classified according to the following categories:

- **Urban fires** are primarily those associated with structures and the activities in and around them.
- **Wildland fires** occur in forests or other generally uninhabited areas and are fueled primarily by natural vegetation.

- **Urban Interface fires** occur where development and forest interface, with both vegetation and structures providing fuel (may also be referred to as urban-wildland interface fires).

Wildland fire behavior and propagation of the fire has three mechanisms:

- **Crawling fire:** the fire spreads via low level vegetation (e.g., bushes)
- **Crown fire:** a fire that "crowns" (spreads to the top branches of trees) can spread at an incredible pace through the top of a forest. Running crown fires can be extremely dangerous to all inhabitants underneath, since all the oxygen is sucked out to feed the fire above, increasing potential for asphyxiation.
- **Jumping or Spotting fire:** burning branches and leaves are carried by the wind and start distant fires; the fire can thus "jump" over a road, river, or even a firebreak.

The following factors contribute significantly to wildland fire behavior:

- **Slope/Topography**: As slope increases, the rate of wildland fire spread increases. South facing slopes are also subject to greater solar radiation, making them drier and thereby intensifying wildland fire behavior.
- **Vegetation/Fuel**: Weight and volume are the two methods of classifying fuel, with volume also referred to as fuel loading (measured in tons of vegetative material per acre). Each fuel is assigned a burn index (the estimated amount of potential energy released during a fire), an estimate of the effort required to contain a wildland fire, and an expected flame length.
- **Weather**: Variations in weather conditions have a significant effect on the occurrence and behavior of wildfires.

Firestorms that occur during extreme weather (e.g., high temperatures, low humidity, and high winds) have high intensity making fire suppression is virtually impossible. These events typically burn until the conditions change or the fuel is exhausted. Even small fires can threaten lives and resources, and destroy improved properties. It is also important to note that in addition to affecting people, wildland fires may severely affect livestock and pets. Such events may require the emergency watering/feeding, shelter, evacuation, and even burying of animals.

Wildfire Secondary Events

The aftermath of a wildfire can be as disastrous if not more so than the fire. A particularly destructive fire burns away plants and trees that prevent erosion. If heavy rains occur after such a fire, landslides, ash flows, and flash floods can occur. This can result in property damage outside the immediate fire area, and can affect the water quality of streams, rivers, and lakes.

Wildfire as a Secondary Event

In addition to typical ignition sources for wildfires, earthquakes or floods have the potential to rupture buried gas lines, and high winds or accidents could cause overhead electric lines to break, creating ignition sources for wildland fires. Catastrophic earthquakes could cause widespread urban fires, as multiple gas and electrical lines could be broken or disrupted.

3.7.2 Wildfire Hazard History

To indicate the potential for a fire event, the following table excerpts recent fires in Riverside County, and is taken from the National Climatic Data Center.

Table 3.20: Wildfire Damage in Riverside County

Date	Injuries	Fatalities	Property Damage	Crop Damage
8/31/1998	0	0	$4,500,000	-
9/30/1999	0	0	$500,000	$500,000
8/01/2000	9	0	$40,000	-
6/23/2001	2	0	$50,000	-
6/29/2001	0	1	-	-
8/18/2003	3	0	$1,000,000	$250,000
5/02/2004	18	0	$8,100,000	-
7/22/2004	3	0	-	$300,000
9/28/2005	0	0	$869,000	-
7/23/2006	3	0	-	-
10/22/2007	0	0	$100,000	$100,000
11/15/2008	0	0	$150,000,000	-
8/27/2009	0	0	$50,000	-
7/15/2010	1	0	$18,000	-
8/3/2010	2	0	-	-

Additionally, Figure 3.13 depicts the fire history throughout the Eastern Municipal Water District service area.

3.7.3 Wildfire Failure Hazard Frequency and Magnitude

Wildfires are a major environmental hazard that have historically cost California more than 800 million dollars each year and contribute to "bad air days" throughout the state. Heat and smoke from fires can be more dangerous than the flames. Inhaling the smoke can sear the lungs and fire also produces poisonous gases that cause disorientation and drowsiness which eventually lead to asphyxiation. As a result, asphyxiation is the leading cause of fire deaths, exceeding burns by a three-to-one ratio.

Figure 3.13 on the following page illustrates the fire threat to EMWDs' service area. As shown in the figure, the expected fire hazard is low.

Wildfires and climate change

Increased usage of fossil fuels for transportation and electricity, along with increased deforestation has led to the overloading of the atmosphere with greenhouse gases such as carbon dioxide (CO2). These heat trapping emissions act as a blanket and increase the overall atmospheric temperature, thus warming the planet. As summers get hotter and longer, the conditions for wildfires increase exponentially. Wildfires in the U.S. have been on an increasing trend and the effects of climate change has shown to aggravate the frequency and duration of wildfires.

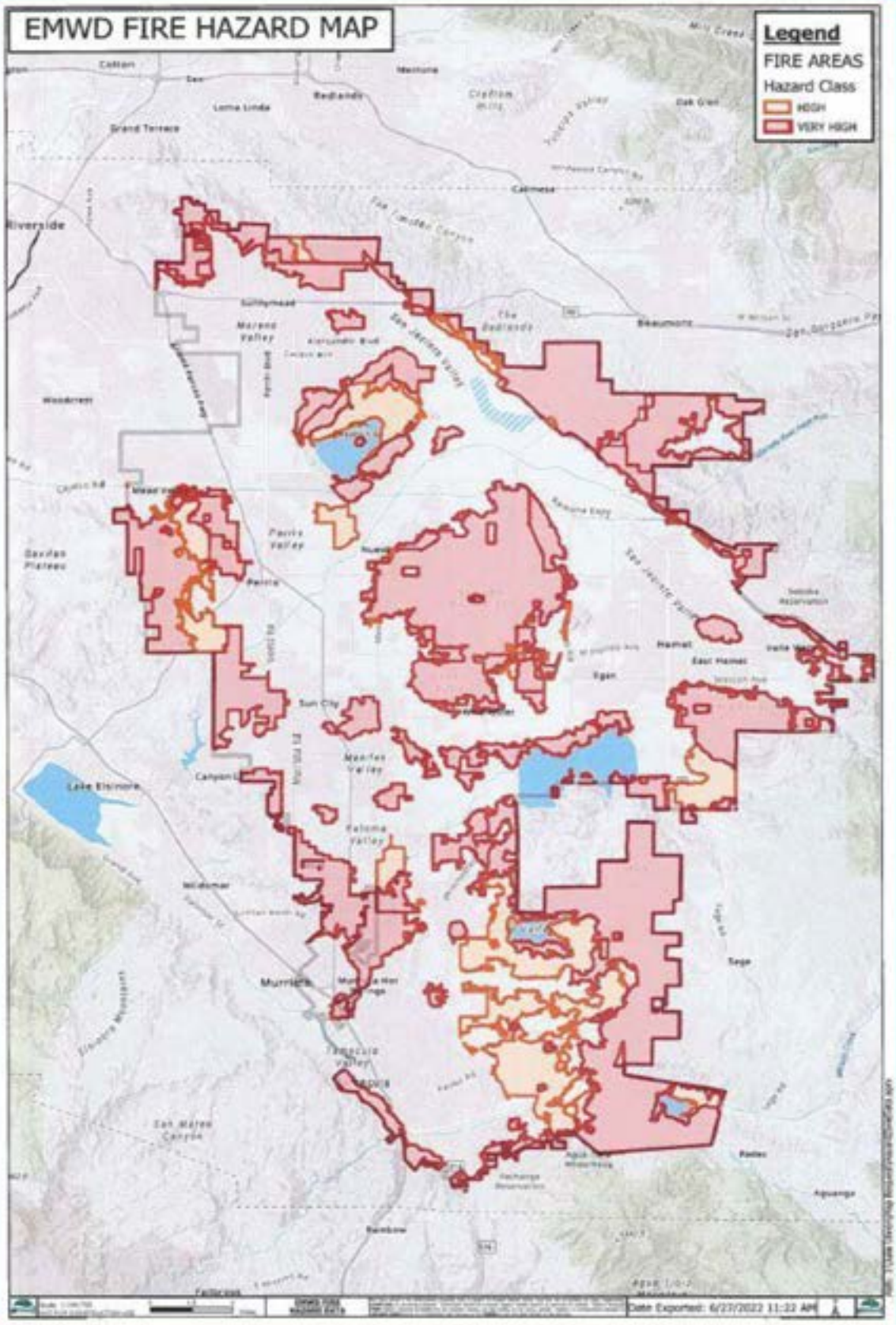


Figure 3.13: District Fire Threat Map

3.8 Hazardous Materials Release Hazard Profile

Hazardous Materials Release Risk Assessment Summary

Risk Rank Category: Moderately High

Probability/Frequency:	Rare event - occurs less than once every 50 years
Consequence/Severity:	Extensive building damage, widespread loss of lifelines (water, gas, electricity, sanitation, roads), loss of life
Vulnerability:	Widespread damage area, significant secondary impacts, no warning time
Location:	Currently, this hazard applies to water treatment and reclamation facilities as well as assets which are near freeways where hazardous materials are being transported. Locations of these assets have not been included in this plan for security reasons, but were considered by the Taskforce when completing the Risk Assessment
Hazard Risk Rank Score:	25
Team Comments:	As the San Onofre Nuclear Plant is no longer operational, it was removed from the list of identified hazards. However, as the plant is still storing hazardous materials which are transported through EMWD Service Area, the Taskforce expanded the range of the Hazard Material Release hazard to include the release of any hazardous material during transport throughout the Service Area

3.8.1 Hazardous Materials Release Hazard Information and Background

Hazardous materials include hundreds of substances that can potentially pose a significant risk to the general population if released. These substances may be highly toxic, reactive, corrosive, flammable, radioactive or infectious. They are present in nearly every community in the United States, where they may be manufactured, used, stored, transported, or disposed. Because of their nearly ubiquitous presence, there are hundreds of hazardous material release events annually that contaminate air, soil, and groundwater resources, potentially triggering millions of dollars in clean-up costs, human and wildlife injuries, and occasionally cause human deaths.

Accidents, which result in chemical clouds or release of hazardous materials into public water or sewer systems, may affect outlying neighborhoods or the community at large. Depending upon the scale of the

release, large segments of the residential and the business populations may need to be evacuated quickly for extended periods of time. Effective emergency planning with regard to hazardous materials, therefore, requires the concentrated efforts of the Fire and Police Departments as well as other public safety officials and private organizations, such as the Red Cross. Hazardous material releases may occur from any of the following:

Table 3.21: Types of Hazardous Materials Incidents

Fixed-Site	Includes all releases involving the production and manufacturing, handling, and storage of a hazardous product at a single facility as well as any releases that may occur at a designated hazardous waste disposal site.
Transportation	Includes all releases that occur while the product is in transit from one facility to another or enroute to be disposed of at a designated hazardous waste disposal site.
Intentional Spills and Releases	Includes all criminal acts and acts of terrorism in which a hazardous material is used to intentionally cause injuries and/or fatalities, damage the environment and/or property, or advance a political or social agenda. Weapons of Mass Destruction (WMD) are discussed in further detail in the Terrorism section of this document.

In response to concerns over the environmental and safety hazards posed by the storage and handling of toxic chemicals, Congress passed the Emergency Planning and Community Right to Know Act (EPCRA) in 1986. To reduce the likelihood of hazardous material releases, EPCRA established specific requirements on federal, state and local governments, Indian tribes, and industry to plan for hazardous materials emergencies. EPCRA's Community Right-to-Know provisions help increase the public's knowledge and access to information on chemicals at individual facilities, their uses, and releases into the environment. States and communities working with facilities can use the information to improve chemical safety and protect public health and the environment. Under EPCRA, hazardous materials must be reported to the EPA, even if they do not result in human exposure. Hazardous material releases may include the following:

- Air emissions (e.g., pressure relief valves, smokestacks, broken pipes, water or ground emissions with vapors)
- Discharges into bodies of water (e.g., outflows to sewers, spills on land, water runoff, contaminated groundwater)
- Discharges onto land
- Solid waste disposals in onsite landfills
- Transfer of wastewater to public sewage plants
- Transfers of waste to offsite facilities for treatment or storage

In addition to accidental human-caused hazardous material events, natural hazards may cause the release of hazardous materials and complicate response activities. The impact of earthquakes on fixed facilities may be particularly damaging due to the impairment of the physical integrity or even failure of

containment facilities. The threat of any hazardous material event may be magnified due to restricted access, reduced fire suppression and spill containment, and even complete cut-off of response personnel and equipment. In addition, the risk of terrorism involving hazardous materials is considered a major threat due to the location of hazardous material facilities and transport routes throughout communities and the frequently limited anti-terrorism security at these facilities.

In recognition of the dangers associated with keeping hazardous substances, the California State legislature has enacted several laws regulating the use and transport of identified hazardous materials. In particular, Chapter 6.95 of the Health and Safety Code requires all businesses using these materials to inform local government agencies of the types and quantities of materials stored on site. This disclosure enables emergency response agencies to respond quickly and appropriately to accidents involving dangerous substances. Chapter 6.95 of the California Health and Safety Code, and Title 19 of the California Code of Regulation, describes the requirements for chemical disclosure, business emergency plans, and community right to know programs. According to these state requirements, a business that uses or handles hazardous materials in amounts equal to or greater than 55 gallons, 500 pounds or 200 cubic feet at any one time must prepare a business emergency plan and chemical inventory. The inventory must be updated annually, and the business plan every two years. The chapter also has incorporated certain requirements from Federal SARA Title III for chemicals designated as acutely hazardous.

The Eastern Municipal Water District is located within proximity to Interstates 10, 15, and 215 and Highways 60, 74, 79, and 91. Due to the volume of traffic and the nature of the materials transported, there is a heightened risk of a hazardous material leak or spill within the service area. The ongoing use, production, and transportation of hazardous materials in and through EMWD pose constant and real threats to the safety of the community. An accidental release of a hazardous substance into the environment has the potential to cause localized or widespread upset.

3.8.2 Hazardous Materials Release Hazard History

According to the Emergency Response Notifications System (ERNS), there have been a total of 2,683 spills and accidents in California during 2015. As illustrated in the table below, many of these incidents were caused by mobile vehicles, which represent a substantial threat to EMWD.

Table 3.22: ERNS Spills and Accidents in California in 2010

Type of Incident	Number of Incidents
Fixed site (e.g., incident at a building)	577
Continuous release	1
Storage tank, drilling platform, or pipeline	176
Unknown sheen on water	522

Mobile vehicle (plane, truck, train, ship, etc.)	971
Other or unknown	0
Total	**2,247**

2012 Richmond Refinery Fire

On August 6, 2012, a piping segment at the Number 4 Crude Unit at a Chevron refinery in Richmond, California, failed, resulting in the release of hydrocarbons. The hydrocarbon vapor cloud then ignited, resulting in a large, uncontrolled fire. The fire burned for several hours before being contained later that night. The picture below illustrates the smoke plume from the fire.

Photo taken from a Cal/OSHA presentation on 2/26/2014

Although no fatalities resulted from the fire, according to the final investigation report completed by the U. S. Chemical Safety Board (CSB), over 15,000 residents in the vicinity of the refinery sought medical treatment for respiratory irritation. The incident inundated local emergency response agencies and interrupted local operation of the Bay Area Rapid Transit (BART). Although the 2012 Richmond Refinery Fire did not impact EMWD, the incident illustrated the potential major impacts that a similar release could have on the Service Area. Fortunately, no hazardous material events of this magnitude have ever occurred with EMWD's service area.

3.8.3 Hazardous Materials Release Hazard Frequency and Magnitude

Since EMWD utilizes chlorine gas for disinfection in the water distribution system, there is an increased risk for hazardous materials releases impacting the service area. To decrease the probability of an accidental release, EMWD has developed a California Accidental Release Prevention Program, Risk Management Plan, and Process Safety Management Plan. These plans include dispersion modelling,

process hazard analyses (including identification of consequences of deviation from normal operation and safeguards), seismic assessments of chlorine process equipment, and operating and maintenance procedures. In addition, to lessen the magnitude of such an event, EMWD has developed emergency response and notification procedures and conducts periodic training exercises. The plans are still maintained however , EMWD has taken significant mitigation actions since the previous HMP was written and approved in 2017.

Following additional review EMWD took the initiative in 2018 to decommission gaseous chlorine at all four regional water reclamation facilities and converted those facilities to sodium hypochlorite. The conversion significantly reduced the risks of leakage associated with transporting, handling, and transferring the chemical from delivery vehicles to storage facilities. The maintenance of equipment also became safer. The transfer required a capital investment of about $7 million and increased operating costs by about $2 million dollars annually. However, the safety of both our employees and the public that we serve was the priority.

District assets that house hazardous materials were not included in this Plan for security reasons. However, the Taskforce determined that areas in and around Perris, Hemet and Temecula were likely to be more vulnerable due to a higher concentration of hazardous materials facilities in those areas. Additionally, it is important to note that hazardous material emergencies also occur during transportation and all major highways are susceptible to releases of toxic and flammable chemicals. While there is currently no mechanism to assign a probability of a fixed-site or transportation hazardous material emergency, it is important to consider a relatively high likelihood of occurrence and conduct planning and training accordingly.

3.9 Terrorism Hazard Profile

Terrorism Risk Assessment Summary	
Risk Rank Category: Moderately High	
Probability/Frequency:	Rare event - occurs less than once every 50 years
Consequence/Severity:	Extensive building damage, widespread loss of lifelines (water, gas, electricity, sanitation, roads), loss of life
Vulnerability:	Widespread damage area, significant secondary impacts, no warning time
Location:	Water treatment and reclamation facility locations are perceived to be more likely targeted due to the presence of hazardous chemicals and access to the water system
Hazard Risk Rank Score:	27
Team Comments:	The Taskforce noted assumed water contamination, or an intentional release of hazardous chemicals was the most likely terrorism scenario for EMWD. Hazard ranking estimates were based on these types of scenarios.

3.9.1 Terrorism Hazard Information and Background

Terrorism is the unlawful use of force or violence against persons or property to intimidate or coerce a government, the civilian population, or any segment thereof, in furtherance of a political or social objective. The Federal Bureau of Investigation (FBI) has categorized two types of terrorism in the United States.

- **International Terrorism** involves terrorist activity committed by groups or individuals who are foreign-based and/or directed by countries or groups outside the United States, or whose activities transcend national boundaries.
- **Domestic Terrorism** involves groups or individuals whose terrorist activities are directed at elements of our government or population without foreign direction.

Well-known international terrorist groups include Islamic Fundamentalist groups, such as Islamic State in Iraq and Syria (ISIS); European terrorists, including the Red Brigade in Italy, Spain's Euskadi Ta Askatasuna (ETA), and the Japanese Red Army; separatist groups, such as Sierra Lumenoso, and the "Shining Path" in Peru. Add to these a host of narco-terrorists, such as the Medellin and Cali drug cartels.

In the U.S., a number of animal rights activists; environmentalist groups; white supremacists, such as the League of Aryan nations; and groups including the Covenant, Sword and Arm of the Lord, New World Order, and skinheads have been responsible for acts of terrorism on U.S. soil. Added to these are groups like the Klu Klux Klan; survivalists, such as the Freemen in Montana; and doomsday cults, such as David Koresh in Waco, Texas, and Jim Jones in Guyana.

There are a number of methods a terrorist may use to carry out their objective, including attacks of a chemical, biological, radiological, nuclear, explosive, and cyber nature. In addition, terrorists conduct hijackings, assassinations, armed assaults, kidnappings/hostage taking, arson fires, sabotage of critical infrastructures such as utilities and transportation, and the dissemination of confidential or otherwise sensitive information for the planning of terrorist attacks.

Chemical

Chemical agents involve the use of chemical compounds to kill or seriously injure its victims. There are numerous kinds of chemical weapons and their effectiveness is determined by a number of factors including age, purity, weather conditions, wind direction, and means of dissemination.

Biological

Biological agents include microbes, such as bacteria or viruses, and toxins derived from plants or animals that can produce illness or death. Illegal facilities that manufacture these substances are difficult to detect because they employ fermentation technology commonly used in the production of legitimate products such as antibiotics, vaccines, wine, and beer.

Radiological and Nuclear

Radiological or nuclear terrorism is the use of radioactive materials and/or nuclear explosives, as well as any terrorist actions against nuclear facilities by individuals or groups, to inflict harm on a population and advance political or social objectives. Sources of radiological material include nuclear fuel cycle waste, medical and dental equipment, military weaponry, and machines used in private industry.

Explosive

The impact of a bombing depends largely on the type, size, and placement of the device used. Additionally, a WMD in combination with an explosive device expands the lethality, physical damage, and economic disruption. The use of an explosive device can also inflict significant disruption of society through destruction of critical infrastructure and widespread fear amongst the target population.

Cyber

Cyber terrorism is a premeditated, politically motivated attack against information, computer systems, computer programs, and data which result in violence against non-combatant targets by sub-national groups or clandestine agents. Cyber terrorists can be domestic or international. Classification of being a

cyber terrorist depends on if the terrorist relies on cyber terrorism to further their cause or use it in addition to conventional terrorism.

Additional Terrorism Methods

Additional terrorism methods include hijackings, kidnappings, and the taking of hostages, armed assaults and mass shootings, assassinations of public figures, sabotage of transportation systems and utility infrastructure, the dissemination of confidential information that would aid terrorist organizations when planning an attack, arson fires, and many other means of disrupting normal society or endangering lives and property.

3.9.2 Terrorism Hazard History

The U.S. has proven to be a high priority target for both domestic and international adversarial/ human-caused events. Acts of terror have become increasingly alarming in their magnitude in recent years. Examples of this include the bombing of the Alfred P. Murrah Federal Building in Oklahoma City and the attacks of September 11, 2001 on the World Trade Center complex and the Pentagon. Not all attacks, however, are at this level of intensity. The U.S. has also been subject to small scale attacks in the past such as the bombing at the Boston Marathon in 2013.

Specifically, EMWD has not been directly impacted by terrorism events in the past. However, a recent attack near EMWD occurred on December 2, 2015. As the result of a mass shooting and attempted bombing at the Inland Regional Center in San Bernardino, 14 people were killed and 22 were seriously injured. 12 of those who died were County employees, 10 of which were environmental health specialists. Those 10 made up 2 percent of the County's health inspectors. The shooting lasted for only a few minutes, but two masked shooters fired more than 100 bullets before fleeing the scene. Local authorities pursued the attackers for 1.7 miles before they stopped in a residential sector to open fire on law enforcement. Residents were instructed to stay in their homes while over 500 rounds of ammunition were exchanged in the street. Both attackers were shot and killed before peace was restored. While this event didn't impact EMWD, the Taskforce recognizes the potential for a similar terrorism event to impact its assets and personnel.

3.9.3 Terrorism Hazard Magnitude and Frequency

As stated above, EMWD recognizes the potential for a terrorism event to impact the service area. Given current escalating terrorism trends, the threat of a terrorist event within the U.S. is a credible possibility and the Taskforce ranked the probability of terrorism accordingly during the Hazard Identification Exercise. Although EMWD does not have any identified hard targets within the service area, the potential threat exists due to its proximity to the City of Riverside, nearby international airports, and other identified targets. However, the Taskforce discussed that administration buildings and sites housing hazardous materials were perceived as more likely to be vulnerable to an act of terrorism.

Additionally, EMWD completed a Vulnerability Assessment to comply with the Bioterrorism Act of 2002. The Vulnerability Assessment evaluated EMWD's vulnerability to malevolent attacks, including terrorism and contamination, and developed recommendations to protect against the malevolent attacks. However, because of the sensitive nature of the information, the terrorism risk assessment results are not repeated as part of the Hazard Mitigation Plan

3.10 Power Failure Hazard Profile

Power Failure Risk Assessment Summary

Risk Rank Category: Moderately High

Probability/Frequency:	Frequent event - occurs more than once a year
Consequence/Severity:	Moderate building damage, minor loss of lifelines (less than 12 hours), lost time injury but no disability
Vulnerability:	Localized damage area
Location:	Assets that rely on electricity are spread throughout the Service Area.
Hazard Risk Rank Score:	24
Team Comments:	None

3.10.1 Power Failure Hazard Information and Background

While electric power, water, telecommunications, highway transportation, wastewater systems, and natural gas are all examples of lifeline utilities necessary for a local community to thrive, loss of power is the utility that has the most potential for disrupting District operations. Loss of any power may occur as a secondary impact of earthquakes, landslides, or failure of pipes or because of human error, among other factors.

Power Failure

A power outage is the loss of the electricity supply to an area. In addition to natural hazards, power failure can result from a defect in a power station, damage to a power line or other part of the distribution system, a short circuit, or the overloading of electricity mains.

A power outage may be referred to as a blackout if power is lost completely, or as a brownout if some power supply is retained, but the voltage level is below the minimum level specified for the system, and a short circuit indicates a loss of power for a short amount of time (usually seconds). Some brownouts, called voltage reductions, are made intentionally to prevent a full power outage.

As discussed in the Earthquake Risk Assessment, the absence of electrical power at EMWD facilities for extended periods can, in some areas, preclude water deliveries where pumping is necessary.

3.10.2 Power Failure Hazard History

The Inland Area has experienced a number of power outages; either as the result of human error or as a secondary impact of natural hazard events. Power outages can also occur as a result of weather cycles and increase fluctuation in energy demand. Some of the significant power outages in California history are discussed below.

2000-2001 California Energy Crisis

In 2000 and 2001, California experienced a shortage of electricity supply as a result of capped prices, market manipulations, and illegal pipeline shutdowns by Texas energy company, Enron. The shortage resulted in multiple large-scale blackouts due to losses in transmission, generation, and/or extremely severe temperatures that lead to heavy electric power consumption. This crisis brought to light many critical issues surrounding the state's power generation and distribution system, including its dependency on out-of-state resources.

2011 Southwest Blackout

September 2011, a system disturbance led to cascading outages and left about 2.7 million people without power. The outages affected parts of Arizona, southern California and Baja California, Mexico. All of about 1.5 million people in San Diego lost power for about 12 hours. This affected schools, businesses, traffic, flights, public transportation and even water and sewage pumping stations.

To mitigate severe consequences and protect local communities from power outages, California has implemented several energy conservations programs, energy efficiency and alternative energy programs. Rolling blackouts during heat waves are an indication of the higher demand for power and the need for appropriate planning for alternate power sources.

2014 Riverside County Storm Outages

In the afternoon on September 9, 2014, a fast-moving storm triggered a severe-weather advisory for both San Bernardino and Riverside Counties and contributed to a blackout that left a least 3,830 homes and businesses without power. Affected areas stretched from San Jacinto to Murrieta. Most power outages were reported between 2:00PM and 3:00PM that day as many areas were impacted by heavy rains. By 5:00PM, the downpour had all but ceased in most areas leaving only the impacts of the residual power outages behind.

3.10.3 Power Failure Hazard Frequency and Magnitude

Currently, there is no mechanism to calculate the probability of a power failure, without evaluating the failure as a cascade effect from natural hazards (i.e., earthquakes). However, based on historical events, minor power failure occurs at least annually and has the ability to impact any part of the service area. To help mitigate the severity in an extreme power outage, EMWD has back-up generators to provide power

for water treatment and reclamation facilities. Furthermore, to evaluate the damage inflicted by a power outage, FEMA has assigned economic values to the loss of electric power. Table 3.23 summarizes the loss estimates per capita per day.

Table 3.23: Economic Impacts of Electric Power

Category	Estimated Economic Impact
Reduced regional economic activity[1]	$87
Impacts on Residential Customers • Direct economic losses • Disruption economic impact • Total Best estimate	 $30 to $35 $63 to 85 $101
Total economic impacts	**$188**

Note: Values are per capita per day

3.11 Drought Hazard Profile

Drought Risk Assessment Summary

Risk Rank Category: Moderately High

Probability/Frequency:	Regular event - occurs between once a year and once every 7 years
Consequence/Severity:	Localized damage area
Vulnerability:	Localized damage area, minor secondary impacts, delayed hazard onset
Location:	Drought has the ability to impact the entire service area
Hazard Risk Rank Score:	9
Team Comments:	The team noted that the most critical impact of drought was economic loss rather than asset damage or personal injury. Recent droughts have proven that conservation efforts typically allow the public to receive a water supply sufficient to support overall public health.

3.11.1 Drought Hazard Information and Background

A drought or an extreme dry periodic climate is an extended period where water availability falls below the statistical requirements for a region. Drought is not a purely physical phenomenon, but rather an interplay between natural water availability and human demands for water supply. The precise definition

of drought is made complex owing to political considerations, but there are generally four types of conditions that are referred to as drought:

- **Meteorological drought** is brought about when there is a prolonged period with less than average precipitation.
- **Agricultural drought** is brought about when there is insufficient moisture for average crop or range production. This condition can arise, even in times of average precipitation, owing to soil conditions or agricultural techniques.
- **Hydrologic drought** is brought about when the water reserves available in sources such as aquifers, lakes, and reservoirs fall below the statistical average. This condition can arise, even in times of average (or above average) precipitation, when increased usage of water diminishes the reserves.
- **Socioeconomic drought** associates the supply and demand of water services with elements of meteorological, hydrologic, and agricultural drought. Socioeconomic drought occurs when the demand for water exceeds the supply because of weather-related supply shortfall.

Due to the extensive nature of water supply infrastructure – reservoirs, groundwater basins, and inter-regional conveyance facilities – mitigation for the effect of short-term dry periods is implicit for most systems. Defining when a drought begins is a function of drought impacts to water users. Hydrologic conditions constituting a drought for water users in one location may not constitute a drought for water users elsewhere, or for water users having a different water supply. Individual water suppliers may use criteria such as rainfall/runoff, amount of water in storage, or expected supply from a water wholesaler to define their water supply conditions.

Drought is a gradual phenomenon. Although droughts are sometimes characterized as emergencies, they differ from typical emergency events. Most natural disasters, such as floods or wildland fires, occur relatively rapidly and afford little time for preparing for disaster response. Droughts occur slowly, over a multiyear period. There is no universal definition of when a drought begins or ends. Impacts of drought are typically felt first by those most reliant on annual rainfall – ranchers engaged in dryland grazing, rural residents relying on wells in low-yield rock formations, or small water systems lacking a reliable source. Drought impacts increase with the length of a drought, as carry-over supplies in reservoirs are depleted and water levels in groundwater basins decline.

Droughts may cause a shortage of water for human and industrial consumption, hydroelectric power, recreation, and navigation. Water quality may also decline, and the number and severity of wildland fires may increase. Severe droughts may result in the loss of agricultural crops and forest products, undernourished wildlife and livestock, lower land values, and raise unemployment.

3.11.2 Drought Hazard History

According to the U.S. Drought Monitor Map released on June 1, 2017 for California, EMWD Service area is in an Abnormally Dry Drought Zone. This point is illustrated in Figure 3.14. It should be noted this map demonstrates an improvement in the region's drought conditions. On the June 7, 2016 release of the same map, the area was designated as an Extreme Drought Zone.

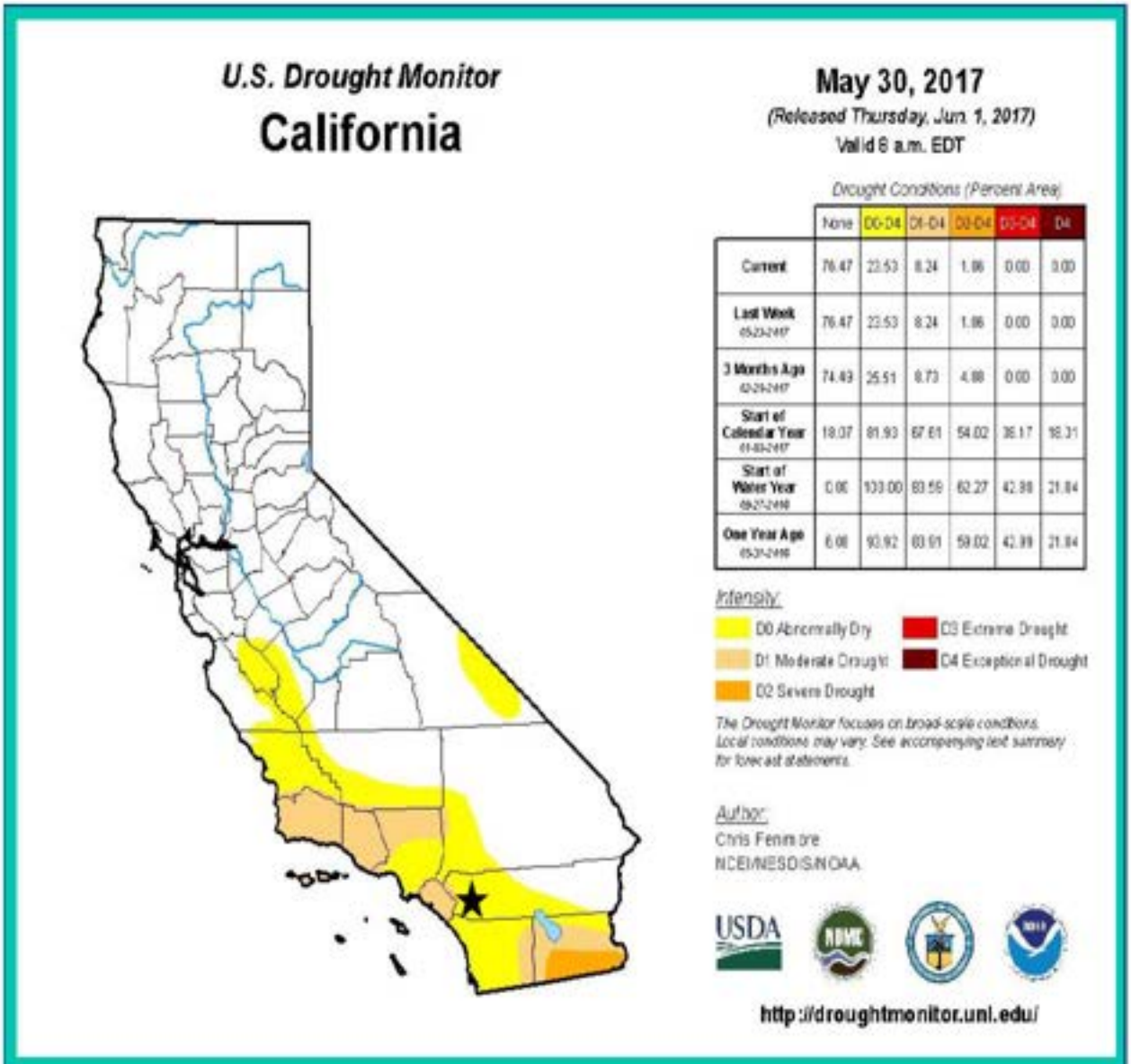


Figure 3.14: California Drought Monitor Map

Over the past century, many of the droughts experienced in the U.S. affected vegetation, food supply and livelihood for tens of thousands of families. This, in turn, created the need for water conservation and water management efforts across the country including California. For example, the Dust Bowl was an extended period of severe drought in the 1930s which affected Oklahoma and parts of Texas, New Mexico,

Colorado, and Kansas. Over the course of a decade, the region experienced four of the driest calendar years since 1895. Topsoil erosion and strong winds resulted in the large dust storms. Reduced vegetation severely impacted the farming-reliant economy forcing tens of thousands of families to relocate in search of better economic condition. Various dam and reservoir projects to allow for a more reliable water supply for the public were constructed because of this historic drought.

The California drought of 1976 to 1977 is another is example of severe drought conditions. By the end of the "wet season" in 1976, California reservoirs were depleted and melting snow from the Sierra snowpack was minimal. The following year was marked as one of the driest years on record. Out of the 58 counties in California, 47 of them declared a local drought emergency, making them eligible for relief money at both State and Federal levels. The drought hit farmers especially hard, with many experiencing economic losses in every stage of food production and supply. This drought marked the beginning of an extensive water conservation movement across California that has continued even through times of abundance. As a result, farmers have switched to water efficient crops and reduced the aggressive pumping of groundwater.

3.11.3 Drought Hazard frequency and Magnitude

Until recent years, EMWD has enjoyed an abundant supply of high-quality water. However, as water demand continues to increase statewide and supply fluctuates through the service area under current drought conditions, EMWD must be even more conscientious of the water supply and maximize efficient use of its natural resources. EMWD works to evaluate new and innovative water management and supply development programs, including water reuse and recycling, rebate incentives and water use efficiency programs. These efforts are helping to enhance long-term water reliably and water quality throughout the Service Area as droughts are likely to impact the entire region.

Drought and Climate Change

It is hypothesized that through increased population and exploitation of fossil fuels during the past century has led to longer and more prevalent droughts in many parts of the U.S. The global warming phenomenon has led to increased rainfall instead of snowfall in many regions, resulting in increased flooding. The, combined with earlier and rapid melting snow, has led to fluctuation in water availability and resulting increased floods in wet regions and drought in dry regions. As inland area temperatures rise and water sources are depleted, the potential for drought in California, including EMWD service area, are expected to continue to increase.

As mentioned in the next section, Section 3.12, District personnel would likely recognize decreased water supply and decreased precipitation, common impacts of climate change, as a drought scenario. As mitigation activities focused on water supply reliability are indifferent to the root cause of water shortage, EMWD has chosen to blend applicable impacts of climate change with its drought mitigation

efforts. All mitigation actions for drought described in Chapter 4 also consider the impacts of certain impacts of climate change.

3.12 Climate Change

With the release of the California Adaptation Planning Guide (APG) in March 2015, EMWD aimed to include the effects of climate change into the Hazard Mitigation Plan update. As identified in the "Understanding Regional Characteristics" portion of the APG, EMWD is located in the Desert Region of California. As a result, the Taskforce considered the following climate change impacts as recommended by the APG:

- Reduced Water Supply
- Increased Temperatures
- Reduced Precipitation
- Diminished Snowpack
- Wildfire Risk
- Public Health and Social Vulnerability
- Stress on Special-Status Species

The Taskforce engaged in a discussion to determine which impacts posed a viable threat to EMWD. While some impacts clearly applied, others required additional research. Studies were conducted to look at recorded trends for reduced water supply, wildfire, and regional temperature increases. The result of the study was the following list of perceived, feasible impacts that might affect EMWD over the next 5 to 10 years:

- Reduced Water Supply
- Increased Temperatures
- Reduced Precipitation
- Wildfire Risk

After reviewing the results of each of these impacts, the Taskforce decided to include hazards in the Plan update that represented how the impacts would be felt by EMWD. For example, increased temperatures, reduced water supply, and reduced precipitation would be recognized as a drought. Additionally, increased temperatures and reduced precipitation might result in a wildfire. Therefore, the Taskforce identified Drought and Wildfire as perceived hazards. Any information regarding the effects of these impacts on EMWD will be found under the hazard profiles listed above. Additionally, mitigation strategies that apply to these impacts will be classified under Drought and Wildfire in the mitigation actions identified in Chapter 4.

3.13 Asset Inventory

§201.6(c)(2)(ii)(A): [The plan should describe vulnerability in terms of] the types and numbers of existing and future buildings, infrastructure, and critical facilities located in the identified hazard area

A critical step required to complete the Risk Assessment is to develop a detailed asset inventory and document potential asset damages due to each identified hazard. The calculated loss estimates will be based on the values determined during the initial asset inventory. In order to produce accurate loss estimates, the Taskforce developed a comprehensive inventory of all assets, including asset locations.

In order to develop loss estimates, specific values were assigned to critical District facilities in the asset inventory. Replacement value estimates were developed utilizing internal sources which included the most recent version of the Asset Value Report.

Loss of Function Values

To provide a mechanism for evaluating the importance of lifelines and critical services, the table on the following page was used to identify per capita values for loss of potable water service. Based upon the population in EMWD's service area, the following values were assigned.

***Table 3.24: Structural* Replacement Values**

Loss of Potable Water Service	Cost of Complete Loss of Service	Cost of Water Unsafe for Drinking
Reduced Regional Economic Activity 1	$35	$8.75
Impacts on Residential Customers	$68	$34
Total Economic Impact (all hazards)	**$103**	**$43**

Note: The values listed in this table were obtained from FEMA's guidance document entitles "What is a Benefit? – Guidance on Benefit-Cost Analysis on Hazard Mitigation Projects, Draft Revision 2.0"

Future Developments

Currently, EMWD is in the process of adding facilities through its Capital Improvement Plan. Although the facilities are not complete, they were added to the asset inventory summary and the team considered their impact on future vulnerability. As none of the new facilities will be manned and they will be built with consideration for hazard mitigation, the Taskforce determined the overall impact to District vulnerability would be negligible. The Asset Inventory Summary for EMWD is presented in the following tables.

3.15 Information Sources

University of South Carolina – Spatial Hazard Events and Losses Database for the United States (http://go2.cla.sc.edu/sheldus/db_registration)

Natural Resources Conservation Service (http://www.wcc.nrcs.usda.gov/climate/windrose.html)

National Climactic Data Center (http://www.ncdc.noaa.gov/oa/ncdc.html)

National Lightning Safety Institute (http://www.lightningsafety.com/)

Wind Hazard Reduction Coalition (http://www.windhazards.org/coalition.cfm)

California Department of Forestry and Fire Protection (http://www.fire.ca.gov/php/index.php)

California Fire Alliance (http://www.cafirealliance.org/)

California Geological Survey (http://www.consrv.ca.gov/cgs/)

Southern California Earthquake Data Center (http://www.data.scec.org/)

California Department of Water Resources (http://www.water.ca.gov/)

Earthquake Hazards Program (http://earthquake.usgs.gov/research/hazmaps/)

4 MITIGATION STRATEGIES

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Tables

4.1 Mitigation Goals and Objectives

To structure goals and objectives that produce appropriate mitigation actions, the hazard profiles and loss estimates were thoroughly reviewed to identify patterns in the location of potential hazard events and the vulnerability of the infrastructure identified within those locations. This information was used to develop clear goals to mitigate the effects of natural hazard events.

Mitigation goals provide guidelines for developing mitigation projects which, in turn, provide prioritized hazard reduction. The mitigation goals are based on previous goals from the 2017 Hazard Mitigation Plan, findings of the risk assessment, and input from the Taskforce for the purpose of characterizing long-term hazard reduction targets as well as the enhancement of current mitigation capabilities. In addition, the goals and objectives were developed to be consistent with the EMWD's overall mission statement:

> *"The mission of Eastern Municipal Water District is to provide safe and reliable water and wastewater services to our community in an economical, efficient and responsible manner, now and in the future."*

§201.6(c)(3)(i): [The hazard mitigation strategy **shall** include a] description of mitigation goals to reduce or avoid long-term vulnerabilities to the identified hazards.

Table 4.1 below includes the Plan goals and corresponding mitigation objectives. These objectives were taken from the 2017 Hazard Mitigation Plan and reviewed by the Taskforce utilizing

- knowledge of the service area (including high-hazard areas and sensitive populations),
- review of past efforts,
- findings of the risk assessment, and
- identification of mitigation projects.

It should be noted that little changed from the original goals and objectives. While some minor edits were made, the spirit of the original goals and objects, as well as the priorities, were maintained in the Plan update.

Table 4.1: Overall Plan Goals and Objectives

Goal 1: Save Lives and Reduce Injuries
• Objective 1a: Initiate mitigation projects which promote resilience for key water/wastewater operations, water supply for critical facilities, integrity of hazardous chemical containment, and reduction of wastewater spillage which could contaminate potable water supplies. • Objective 1b: Identify and Improve emergency response/operations capabilities
Goal 2: Avoid Damages to Property
• Objective 2a: Review and upgrade current safety mechanisms to encourage early detection and isolation of damaged facilities. • Objective 2b: Identify repetitive damage facilities and implement project to mitigate future damages • Objective 2c: Consider existing facility hazards and mitigate vulnerability through improved design for new facilities • Objective 2d: Research, develop, and adopt cost-effective codes and standards to make properties more resistant to damage in addition to improving life safety
Goal 3: Protect the Environment
• Objective 3a: Review proposed projects and evaluate any environmental impacts, in accordance with the EMWD's adopted code of ethics before initiation. • Objective 3b: Initiate mitigation projects that improve environmental sustainability
Goal 4: Promote Hazard Mitigation as an Integrated Policy
• Objective 4a: Integrate hazard mitigation policies into the EMWD's master planning efforts. • Objective 4b: Improve and maintain partnerships with cities within the Service Area and Riverside County Emergency Services • Objective 4c: Enhance public awareness of the importance, and perceived benefits, of hazard mitigation through continued outreach

4.2 Identification of Mitigation Recommendations

§201.6(c)(3)(ii): [The mitigation strategy shall include a] section that identifies and analyzes a comprehensive range of specific mitigation actions and projects being considered to reduce the effects of each hazard, with particular emphasis on new and existing buildings and infrastructure.

§201.6(c)(3)(iv): For multi-jurisdictional plans, there must be identifiable action items specific to the jurisdiction requesting FEMA approval or credit of the plan.

Mitigation actions are administrative and/or engineering project recommendations to reduce the EMWD's vulnerability to the identified hazards. Safety ,Risk, and Emergency Management along with Engineering staff involvement were required in the development of actions and projects that are designed to mitigate the impact of identified hazards and solve problems effectively within the EMWD's long-term mitigation goals and capital improvements. During the third Taskforce meeting, a team-based approach was utilized to brainstorm mitigation projects based on the identified hazards and associated loss estimates. In addition, the Federal Emergency Management Agency's (FEMA) Local Mitigation Action Planning Handbook and the California Adaptation Planning Guide were used to identify actions to mitigate the effects of climate change.

The evaluation and prioritization of the mitigation actions was used as an aid to produce a list of recommended mitigation actions to incorporate into the mitigation plan. Each of the mitigation recommendations will fall into one or more of the following categories:

- **Prevention** – planning and zoning, building codes, capital improvement programs, open space preservation, and storm water management.
- **Property Protection** – acquisition, elevation, relocation, structural retrofits, storm shutters, and shatter-resistant glass.
- **Personnel Education and Awareness** – outreach projects, real estate disclosure, hazard information centers, and education programs.
- **Natural Resource Protection** – sediment and erosion control, stream corridor restoration, watershed management, forest and vegetation management, and wetland restoration and preservation.
- **Emergency Services** – warning systems, emergency response services, and protection of critical facilities.
- **Structural Projects** – dams, levees, floodwalls, seawalls, retaining walls, and safe rooms.

Table 4.2 provides an overview of the mitigation action and other relevant information, in no specific order. Following the identification of mitigation actions, a Cost-Benefit Review was conducted in order to determine a prioritization of the items. Section 4.4 contains more information on the Cost-Benefit review and the prioritization of the projects.

Table 4.2: Mitigation Action Identification 2023

Mitigation Activity	Hazards Mitigated	Mitigation Action Category	Corresponding Goals & Objectives	Responsible Department	Resources	Estimated Project Cost	Timeframe	Protects New Buildings	Protects Existing Buildings
2023.HMP.01 - Review emergency materials inventory, identify potential gaps, and procure items to improve continuity of operations. Include redundant structural materials to minimize emergency repair time.	All Hazards	Emergency Services	1B	Warehouse	General Funding	$150k/year	Short	N	Y
2023.HMP.02 - Emergency Operations Center upgrades and training. Coordinate training for all EOC responders. Laptops for response and additional technology to improve capabilities	All Hazards	Emergency Services	1B	SREM	General funding	$10k - $25K	Medium	N	Y
2023.HMP.03 – Continue to upgrade communications systems to ensure interoperability during a disaster.	All Hazards	Emergency Services	1B	SREM	Grants/ General Funding	$2,500,000	Short	Y	Y
2023.HMP.04- Purchase additional satellite phones to improve emergency communications	All Hazards	Emergency Services	1B	SREM	Grants/ General Fund	$25,000	Short	Y	Y
2023.HMP.05 – Purchase a 40-ton crane to increase EMWD's ability to respond to emergencies and maintain critical infrastructure.	Earthquake/ Flood & Dam / Reservoir Failure	Property Protection	3A, 2B	Water Operations/ Maintenance Services	Grants /General Fund	$1,250,000	Long	N	Y
2023.HMP.06 – Continue to conduct analysis of critical facilities to determine level of imperviousness to extreme weather events and utilize the maintenance schedule to make upgrades to improve resiliency	Extreme Weather	Property Protection	2A	Water Operations/ Maintenance Services	General Fund	Staff Time	Long	Y	N
2023.HMP.07 - Include considerations for extreme weather (i.e., wind, high heat, excessive rain, etc.) events into new building planning documents	Extreme Weather	Property Protection	2D, 4A	Water Operations/ Maintenance Services	General Fund/ Staff Time	Staff Time	Medium	Y	N
2023.HMP.08 - Continue assessments to elevate at-risk subterranean facilities to above grade locations and ensure future builds are assessed for risk.	Flood & Dam/Reservoir Failure	Structural Project	2C	Operations/ Engineering	Capital Improvements	$10mil/ project	Ongoing	N	Y
2023.HMP.09 – Continue to identify facilities located within the updated dam inundation zones currently under development by Riverside County and implement mitigation projects as appropriate.	Flood & Dam/Reservoir Failure	Property Protection	1A	SREM/ Engineering Services	General Fund/ Staff Time	Staff Time	Short	Y	Y
2023.HMP.10 – Continue to review and enhance infrastructure maintenance and monitoring schedules to increase the opportunity to identify and repair equipment prior to failure.	Infrastructure Failure/ Power Failure	Prevention	2D	Operations and Maintenance	Staff Time/ General Fund	Staff Time	Long	Y	Y
2023.HMP.11– Review brush clearance standards, particularly for facilities in border areas, and identify ways to expand clearance areas. Prioritize those facilities in areas identified as being vulnerable to wildfire.	Wildfire	Property Protection	2A	Maintenance Services	General Fund	Staff Time	Medium	N	Y
2023.HMP.12- Purchase emergency water tenders for use during wildfire/ seismic incidents	Wildfire/ Earthquake	Property Protection	1A	SREM	General Fund	$1,500,000	Short	Y	Y
2023.HMP.13– Establish a Multi- hazard Response Emergency Response Team; Hazardous Materials, trench rescue, and elevated surface rescue	Hazardous Material Release/ Earthquake	Personnel Education and Awareness	4A	SREM	General Fund	$250k/year	Short	Y	Y

4.3 National Flood Insurance Program Compliance

§201.6(c)(3)(ii): [The mitigation strategy] must also address the jurisdiction's participation in the National Flood Insurance Program (NFIP), and continued compliance with NFIP requirements, as appropriate.

The National Flood Insurance Program (NFIP) is a federal program enabling property owners in participating communities to purchase insurance as a protection against flood losses in exchange for State and community floodplain management regulations that reduce future flood damages. Participation in the NFIP is based on an agreement between communities and the Federal Government. If a community adopts and enforces a floodplain management ordinance to reduce future flood risk to new construction in floodplains, the Federal Government will make flood insurance available within the community as a financial protection against flood losses. This insurance is designed to provide an alternative to disaster assistance to reduce the escalating costs of repairing damage to buildings and their contents caused by floods.

The EMWD is not a floodplain manager and relies on local cities and Riverside County's floodplain manager. Table 4.3 represents the participation of the cities on the EMWD's service area and Riverside County.

Table 4:3: EMWD Service Area NFIP Participation

CID	Community Name	County	Init FHBM Identified	Init FIRM Identified	Curr Eff Map Date	Reg-Emer Date	Tribal
060253	Hemet, City of	Riverside	05/24/74	09/29/78	08/28/08	09/29/78	No
065074	Moreno Valley, City of	Riverside		06/18/87	08/28/08	06/18/87	No
060751	Murrieta, City of	Riverside		04/15/80	08/28/08	06/09/93	No
060258	Perris, City of	Riverside	09/06/74	04/16/79	08/28/08	04/16/79	No
065056	San Jacinto, City of	Riverside		09/28/73	08/28/08	09/28/73	No
060742	Temecula, City of	Riverside		09/02/93	08/28/08	08/28/91	No
060245	Riverside County	Riverside		04/15/80	08/28/08	04/15/80	No

Flood Recommendations/Repetitive Loss Properties

There were no properties identified as having repetitive losses or assets impacted by regular flooding. EMWD facilities are robust, and damage is expected to be minimal. Still, the EMWD identified several recommendations to mitigate flood hazards in Table 4.2: Mitigation Action Identification. Specifically, actions 2023.HMP.06, 2023.HMP.07, and 2023.HMP.08 are designed to minimize losses to critical EMWD facilities from flooding.

4.4 Prioritization of Mitigation Recommendations

§201.6(c)(3)(iii): [The mitigation strategy section **shall** include] an action plan describing how the actions identified in section (c)(3)(ii) will be prioritized, implemented, and administered by the local jurisdiction. **Prioritization shall** include a special emphasis on the extent to which benefits are maximized according to a cost benefit review of the proposed projects and their associated costs.

A simplified Benefit-Cost Review was applied in order to prioritize the mitigation recommendations for implementation. The priority for implementing mitigation recommendations depends upon the overall cost effectiveness of the recommendation, when taking into account monetary and non-monetary costs and benefits associated with each action. Additionally, the following questions were considered when developing the Benefit-Cost Review:

- How many people will benefit from the action?
- How large an area is impacted?
- How critical are the facilities that benefit from the action?
- Environmentally, does it make sense to do this project for the overall community?

Table 4.4 on the following pages provides a detailed benefit-cost review for each mitigation recommendation, as well as a relative priority rank (High, Medium, Low) based upon the judgement of the Taskforce. The general category guidelines are listed below.

- High – Benefits are perceived to exceed costs without further study or evaluation.
- Medium – Benefits are perceived to exceed costs, but may require further study or evaluation prior to implementation
- Low – Benefits and cost evaluations requires additional evaluation prior to implementation

It should be noted that values for costs (cons) are estimates only.

Table 4.4: Mitigation Action Prioritization Benefit-Cost Review

Mitigation Project	Benefit (Pros)	Costs (Cons)	Priority
2023.HMP.01 - Review emergency materials inventory, identify potential gaps, and procure items to improve continuity of operations. Include redundant structural materials to minimize emergency repair time.	• Avoided Loss-of-Function Costs • Avoided Emergency Management Costs • Increased ability to share resources and improve regional emergency response (Cal WARN)	• Staff Time to review inventory and source equipment. • Equipment Costs ($100K/year)	Medium
2023.HMP.02 - Emergency Operations Center upgrades and training. Coordinate training for all EOC responders. Laptops for response and additional technology to improve capabilities	• Avoided Loss-of-Function Costs • Avoided Emergency Management Costs • Improved Emergency Response Capabilities	• Staff Time for coordination • $10k - $25K	High
2023.HMP.03– Continue to upgrade communications systems to ensure interoperability during a disaster.	• Improved Emergency Communications Capabilities • Avoided Emergency Management Costs • Avoided Casualties	• Equipment Costs ($1,000,000 for system upgrades) • Staff Time	Medium
2023.HMP.04- Purchase additional satellite phones to improve emergency communications	• Avoided Loss-of-Function Costs • Avoided Emergency Management Costs • Improved Emergency Response Capabilities • Avoided Casualties	• Equipment Costs ($25,000 for satellite) • Staff time	High
2023.HMP.05 – Purchase a 40-ton crane to increase EMWD's ability to respond to emergencies and maintain critical infrastructure.	• Avoided Loss-of-Function Costs • Improved Resiliency • Avoided Physical Damages	• Equipment Costs ($1,250,000/ unit)	Medium
2023.HMP.06 - Conduct an analysis of critical facilities to determine level of imperviousness to extreme weather events and utilize the maintenance schedule to make upgrades to improve resiliency	• Avoided Physical Damages • Improved vulnerability awareness • Avoided Loss-of-Function Costs • Avoided Emergency Management Costs	• Evaluation Costs • Maintenance Costs (???) • Administration/ Management Costs • Staff Time	Medium

Mitigation Project	Benefit (Pros)	Costs (Cons)	Priority
2023.HMP.07 – Continue to include considerations for extreme weather (i.e., wind, high heat, excessive rain, etc.) events into new building planning documents	• Avoided Physical Damages • Avoided Loss-of-Function Costs • Improved building design for new facilities	• Staff Time	High
2023.HMP.08 – Continue assessments to elevate at-risk subterranean facilities to above grade locations and ensure future builds are assessed for risk.	• Avoided Physical Damages • Avoided Loss-of-Function. • Improved Resiliency • Avoided Emergency Management Costs	• Construction Costs ($10,000,000/ Project)	Low
2023.HMP.09- Identify facilities located within the updated dam inundation zones currently under development by Riverside County and implement mitigation projects as appropriate.	• Avoided Physical Damages • Avoided Loss-of-Function. • Improved Vulnerability Awareness • Avoided Emergency Management Costs	• Staff Time • Project Costs (potential project value unknown)	Low
2023.HMP.10 – Review and enhance infrastructure maintenance and monitoring schedules to increase the opportunity to identify and repair equipment prior to failure.	• Avoided Physical Damages • Avoided Loss-of-Function Costs • Improved Resiliency • Avoided Emergency Management Costs	• Staff Time	High
2023.HMP.11– Review brush clearance standards, particularly for facilities in fringe areas, and identify ways to expand clearance areas. Prioritize those facilities identified as being vulnerable to wildfire.	• Reduced vulnerability to wildfire. • Avoided Physical Damages • Improved standards for brush clearance	• Staff Time	Medium
2023.HMP.12 - Purchase emergency water tenders for use during wildfire/ seismic incidents	• Avoided Physical Damages • Improved Emergency Management Capabilities • Avoided Loss-of-Function Costs • Avoided Emergency Management Costs • Avoided Casualties	• Equipment Costs ($1,500,000/ unit)	Medium
2023.HMP.13 – Establish a Multi- hazard Response Emergency Response Team; Hazardous Materials, trench rescue, and elevated surface rescue	• Avoided Casualties • Avoided Emergency Management Costs • Avoided Physical Damages	• Training Costs ($250K/year)	High

4.5 Implementation Strategy

Mitigation actions classified as high priority provide the most signification perceived vulnerability reduction, as related to cost and probability, and are typically implemented before lower ranked improvements. The EMWD may, however, find that under some circumstances a recommendation classified as a lower-priority mitigation action may need to be implemented before a higher priority recommendation. The priority levels associated with each improvement are indicated in Table 4.5 "Mitigation Action Prioritization: Benefit-Cost Review" in the previous section.

Mitigation Strategy Evolution

The Taskforce reviewed the mitigation actions in the 2017 Hazard Mitigation Plan and used them as a springboard for mitigation action development for the current Plan update. The term "development" is used in this context, rather than "update", because the team felt some changes were required to focus the Plan on actions that would continue EMWD's goal of resiliency.

First, it was important for the Committee to judge progress through the identification of completed mitigation actions. The 2017 mitigation actions were reviewed and completed actions were removed. Below is a list of completed actions from the previous Plan.

Second, the Taskforce identified those actions that no longer made sense. In many cases, mitigation actions from the 2011 Hazard Mitigation Plan called out for activities that are ongoing parts of the EMWD's normal operations. While prevention efforts oftentimes contribute to successful mitigation, the Taskforce felt the update should only include actions that enhanced or added to existing efforts. Anything deemed as being part of "normal operations" was removed. Table 4.5 below identifies actions from the previous plan and the actions taken.

The Taskforce considered the open actions and determined in what form they would be present in the current update.

Table 4.5: 2017Corresponding Mitigation Actions

2017 Mitigation Action:	Mitigation Action:
2017.HMP.01 - Review emergency materials inventory, identify potential gaps, and procure new items to improve the continuity of operations. Include redundant structural materials to minimize emergency repair time.	Additional pipeline materials are maintained in emergency storage for any potable/recycled pipeline that crosses an earthquake fault.
2017.HMP.02 - Review and refresh mutual aid agreements. Identify potential gaps and enter in new agreements as appropriate	MOU with Emergency Response Network of the Inland Empire(ERNIE) and CALWARN are in place. Purchasing dept. has multiple contracts in place for emergency purchases.

2017 Mitigation Action:	Mitigation Action:
2017.HMP.03 - Update the radio system to enhance communications during a disaster.	Invested in a new radio system district wide. Improvement to towers ensures better coverage.
2017.HMP.04 - Purchase an additional satellite to improve emergency communications	EMWD purchased six satellite phones. There were four that have been staged at the RWRF.
2017.HMP.05 – Enhance public and student outreach programs to include education on how to prepare for the impacts of hazards on water and wastewater operations.	Ongoing: social media, website, and press releases outlining how to prepare emergency water supplies in the event of an interruption due to an earthquake or other disasters. Ongoing: social media and website information related to the sewer system and how to prevent spills (i.e., FOG and healthy sewers campaigns)
2017.HMP.06 - Identify repetitive pipeline break areas and incorporate pipeline replacement in the Capital Improvement Plan.	Ongoing-Leak application was developed that allows staff to enter specifics on breaks, including exact location and probable cause. The data is displayed on a heat map to identify areas of concern.
2017.HMP.07 - Elevate at-risk subterranean facilities to above-grade locations: A list of facilities requiring elevation can be found in the Engineering Department	Ongoing-Below grade facilities are in the process of being replaced. Generators have been installed at 53 of 55 lift stations. Generators are scheduled to be added at critical booster facilities.
2017.HMP.08 - Identify facilities located within the updated dam inundation zones currently under development by Riverside County and implement mitigation projects as appropriate.	Swamp coolers and A/C units are being added where necessary. All facilities are designed to meet current building codes, with wildfire mitigation as an additional consideration.
2017.HMP.09 – Enhance the EMWD's Emergency 24/7 webpage to include tips for the public for extreme weather as they pertain to water service	EMWD's 24/7 Emergency Information webpage (https://www.emwd.org/247-emergency-information) includes information about: • Preventing Frozen Pipes • PSPS events Emergency Preparedness: How to prepare emergency water supplies
2017.HMP.10 – Review brush clearance standards, particularly for facilities in fringe areas, and identify ways to expand clearance areas. Prioritize those facilities in areas identified as being vulnerable to wildfire.	As new facilities and upgrades are being made, locations are being assessed to ensure resiliency.
2017.HMP.11 – Identify facilities located within the updated dam inundation zones currently under development by Riverside County and implement mitigation projects as appropriate.	Due to budgetary constraints EMWD was unable to move forward with this project.

2017 Mitigation Action:	Mitigation Action:
2017.HMP.12 – Identify opportunities to enhance training for the Hazardous Materials Emergency Response Team and implement improvements as appropriate.	Ongoing-This is assessed regularly to ensure facilities and equipment have preventative maintenance performed at the proper intervals.
2017.HMP.13 – Review brush clearance standards, particularly for facilities in fringe areas, and identify ways to expand clearance areas. Prioritize those facilities in areas identified as being vulnerable to wildfire.	In progress-Facilities have been identified Contracts and agreements will be executed to ensure resiliency efforts can continue.
2017.HMP.14 – Purchase emergency water tenders for use during wildfire/ seismic incidents	Due to budgetary constraints EMWD was unable to make the purchase at this time. Will include in next HMP update.
2017.HMP.15 – Identify opportunities to enhance training for the Hazardous Materials Emergency Response Team and implement improvements as appropriate.	Due to the identification of additional needs no action was taken at this time. Will continue with updated project in the update HMP.
2017.HMP.16 – Implementation of proposed Capital Improvement Projects to augment water supply (Perris II Desalination and San Jacinto Valley enhanced recharge and Recovery Program Phase 1)	Perris II Desalter project completed.

The complete list of mitigation actions, including re-envisioned 2017 mitigation actions and new ideas brainstormed by the Taskforce, can be found in Table 4:2 Mitigation Action Identification. As mentioned above, the Taskforce was committed to,

- Removing actions that are part of normal or ongoing operations and designing new actions that improve upon current efforts.
- Improving action tracking by designing actions that are trackable and have definitive endpoints, where possible
- Including fewer but more focused actions that are realistic tasks that could be accomplished within the planning timeline.

These shifts in priorities were made in an effort to make the Plan more relevant and better positioned to be incorporated into future policy, facility, and outreach campaign development.

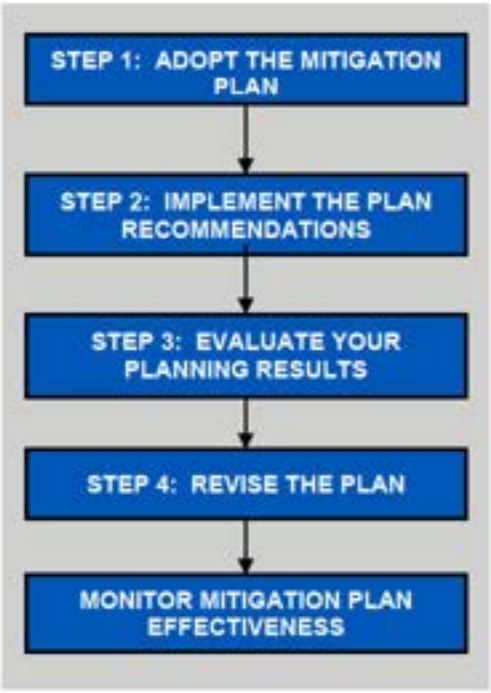
5 PLAN MAINTENANCE

Table of Contents

Tables

5.1 Mitigation Progress Monitoring

The Mitigation Strategy section in the Hazard Mitigation Plan (HMP) identifies mitigation actions that have been prioritized based on the loss estimates and the probability of each hazard, which will typically be implemented according to the priority rank. To thoroughly track hazard mitigation status, the Eastern Municipal Water District (District) must continuously monitor and document the progress of the implementation of mitigation actions. Though mitigation actions may be delegated to different departments within EMWD, the Safety, Risk, & Emergency Management (SREM) Department will be responsible for monitoring overall progress. SREM personnel meet regularly to discuss District hazard vulnerability and to plan training events. As part of these meetings, mitigation action implementation will be discussed, monitored, and propelled.



§201.6(c)(4)(i): [The plan maintenance process **shall** include a] section describing the method and schedule of **monitoring**, evaluating, and updating the mitigation plan within **a five-year cycle.**

§201.6(d)(3): [The plan **shall** include a] Was the plan revised to reflect changes in priorities?

To facilitate the monitoring process, Table 5-6: "HMP Action Item Implementation" was developed to provide a mechanism for monitoring the overall implementation progress. The table is designed to monitor mitigation actions according to department assignments, project status, and project milestones. It is located at the end of this chapter.

5.2 Capability Assessment

§201.6(c)(4)(ii): [The plan **shall** include a] process by which local governments incorporate the requirements of the mitigation plan into other planning mechanisms such as comprehensive or capital improvement plans, when appropriate.

Capability assessment is an integral part of mitigation planning because through identification and review of existing authorities, policies, programs, and resources, the Taskforce can determine its capacity to carry out mitigation goals and objectives. In addition, the assessment can illuminate alternative mitigation actions, propelling the Taskforce to utilize potentially overlooked resources.

The following subsections attempt to document the Regulatory, Administrative/Technical, Fiscal, Grant funding, and Outreach/Partnership resources available to EMWD.

Regulatory Resources

Table 5.1: Regulatory Tools Table

Regulatory Tool	Updated	Comments
Strategic Plan 2016-2018	2016	The Plan organizes decisions and actions to better direct EMWD to accomplish organizational missions. Includes considerations for the environment, public health, maintenance, water recycling, and service reliability.
Water Shortage Contingency Plan	10/28/2015	Plan outlines legality and framework for imposing water use restrictions and fines in times of water shortage
Urban Water Management Plan	June 2016	Plan outlines forecasts for drought probability and magnitude while expanding upon awareness of drought hazard vulnerability.

Administrative/Technical Resources

Table 5.2: Administrative/Technical Tools Table

Administrative/Technical Tool	Personnel/Resources
Safety, Risk, and Emergency Management Department (SREM)	SREM Director, SREM Officers, EOC Responders
Board of Directors	President, Vice-President, Treasurer, Division Directors, Metropolitan Water District of Southern California Chairman, Santa Ana River Watershed Project Authority Commissioner. This group has the authority to pass legislation to implement mitigation objectives.
Operations & Engineering Department	This department employs multi-faceted groups will an array of technical backgrounds. In a review of maintenance, upgrade, and construction protocols, this group can ensure mitigation objectives are implemented at the design level.
Legislative Review Committee	Committee members review proposed legislation and can make suggested improvements to include hazard mitigation objectives.
Plan Review Committee	Committee members review planning documents and can make suggested improvements to include hazard mitigation objectives.

Fiscal Resources

Table 5.3: Fiscal Tools table

Fiscal Tool	Notes
General Funding	Although subject to council approval, the general fund can be utilized to support a wide range of mitigation efforts.
Capital Improvement Program	This program is reviewed annually and allocated funds for facility construction and facility improvement projects.

Grant Funding

Table 5.4: Grant Funding Tools

Grant Funding Tool	Agency	Purpose	Contact
Pre-Disaster Mitigation Program (PDM)	U.S. Department of Homeland Security, Federal Emergency Management Agency	To provide funding for States, and communities for cost-effective hazard mitigation activities which complement a comprehensive hazard mitigation program and reduce injuries, loss of life, and damage and deconstruction of property.	FEMA 500 C. Street, SW Washington, DC 20472 Phone: (202) 646-4621 www.fema.gov
Hazard Mitigation Grant Program	U.S. Department of Homeland Security, Federal Emergency Management Agency	To prevent future losses of lives and property due to disasters; to implement State local hazard mitigation plans; to enable mitigation measures to be implemented during the immediate recovery from a disaster; and to provide funding for previously identified mitigation measures to benefit the disaster area.	FEMA 500 C Street S.W. Washington, DC 20472 Phone (202) 646-4621 www.fema.gov

For a more comprehensive list of grant funding resources, please refer to the County of Riverside Multi-Jurisdictional Local Hazard Mitigation Plan.

Outreach and Partnership Resources

Table 5.5: Outreach and Partnership Tools

Outreach/Partnership Tools	Notes
District Website	Updated regularly, the website can be utilized to provide hazard-related information continuously and formatted to highlight relevant information should the threat of a hazard event arise.
Cal WARN	Through a mutual partnership with local water districts, EMWD can
Public Outreach	EMWD holds several training opportunities throughout the year. Public safety training will be able to be expanded to include hazard-specific information to improve hazard awareness.

5.2.1 Available Planning Mechanisms to Incorporate Mitigation Requirements

EMWD maintains the following processes to incorporate mitigation strategies of the HMP in planning mechanisms. While many of these are listed in the tables above, the following subsection provides additional details.

Website

The HMP will be posted on the EMWD website to enable members of the public to review and provide feedback regarding mitigation objectives and strategies continuously going forward. Feedback from the public can be incorporated during the Plan's annual review or five-year update. In addition, the website will serve as a vehicle to maintain an ongoing conversation with the public about upcoming mitigation projects and provide an avenue for hazard education. Currently, the basic 2017 Plan is available through the website. EMWD can expand its 24/7 Emergency Info page to include links to emergency resources as well as tips for dealing with a water/wastewater service interruption.

SREM Department

EMWD assembled the SREM department to manage emergency preparedness planning and promote environmentally friendly policies within EMWD. The Team meets regularly to discuss planning updates, training schedules, mitigation projects, and policy reviews. SREM Team members will be an active driving force for encouraging the implementation of mitigation actions. Since the team is responsible for planning and emergency preparedness training, they will be responsible for expanding emergency services capabilities and including hazard awareness in training exercises.

Legislative Review Committee

EMWD's Legislative Review Committee is dedicated to closely following regulations that impact District operations. As part of this effort, the Legislative Review Committee meets every three weeks and is tasked with receiving and reviewing all bills, including hazard legislation, for District applicability. Encouraged by SREM personnel, the Committee will review the HMP and make recommendations to the Board of Directors to update current policies to include considerations to mitigate identified hazards.

Operations and Engineering Meeting

Operations and Engineering meetings are held every two weeks to conduct facility design reviews. These meetings are a mechanism for incorporating mitigation elements into future facility designs (e.g., flexible couplings, earthquake valves, backup power generation, etc.). Through these meetings, Taskforce members from the Engineering Department will have the opportunity to

suggest hazard mitigation objectives to be included in the design of new facilities and through maintenance for existing ones.

Materials Approval Committee

EMWD's Materials Approval Committee reviews and provides approval for materials (e.g., valves, piping, etc.), while following industry standards and best practices to ensure proper mitigation strategies are employed. Encouraged by members of the SREM department, the Materials Approval Committee can recommend that the inventory be expanded to include redundant materials to minimize repair time, as suggested in Table 4.2: Mitigation Actions Identification.

Plan Review Committee

EMWD Plan Review Committee meets bi-weekly to review plans for upcoming projects. These meetings provide a mechanism for incorporating mitigation elements into future facility designs. Encouraged by SREM staff, this committee will determine how mitigation goals and objectives can be included in future projects.

Local Area Planning Committee

EMWD is located within the California Governor's Office of Emergency Services (Cal OES) LEPC Region VI and regularly sends a representative to attend the Local Area Planning Committee meetings where emergency planning and mitigation efforts are discussed at a regional planning level. While not necessarily an objective of the HMP, District representatives will have an opportunity through this forum to share mitigation strategies and regional data to assist local communities in improving their mitigation efforts.

Southwest Committee

The Southwest Committee is a subsidiary of the Office of Emergency Services Local Area Planning Committee dedicated to discussing hazards at a local level. EMWD typically has a representative present at all Committee meetings. Participation in Committee meetings will allow EMWD to promote mitigation objectives within the local community and encourage coordination with local communities to work together to improve resiliency.

Safety Council

District senior management periodically meets to discuss employee health and safety, including training needs, safety audits, and regulatory inspections, providing a forum for management to discuss the vulnerability of District employees to hazards. With encouragement from the SREM department, this council can improve the education and resources provided to District personnel in preparing for and dealing with hazardous events.

Metropolitan Member Agency Response System (MARS)

As a member agency of the Metropolitan Water District of Southern California, EMWD has access to communicate with adjacent water agencies through MARS, share mitigation ideas, and work in tandem to improve preparedness throughout the region. Additionally, this program facilitates mutual aid response during an emergency event.

California Water Agency Response Network (Cal WARN)

EMWD participates in Cal WARN, which provides members with emergency planning, response, and recovery information before, during, and after an emergency. In order to facilitate timely emergency response and promote mutual aid, the WARN website maintains an emergency equipment database that matches utility resources with a member's needs during an emergency. A member can locate emergency equipment (pumps, generators, chlorinators, evacuators, etc.) and trained personnel (e.g., treatment plant operators) that may be needed in an emergency. Through Cal WARN coordination, EMWD can estimate the amount of redundant inventory to maintain in order to improve resiliency for EMWD and neighboring water agencies.

5.4 Periodic Assessment Requirements

§201.6(c)(4)(i): [The plan maintenance process **shall** include a] section describing the method and schedule of monitoring, **evaluating**, and updating the mitigation plan within a five-year cycle.

Planning is an ongoing process, and as such, the HMP should be treated as a living document that must grow and adapt to keep pace with changes within EMWD. An annual assessment will be completed to document any changes in site hazards (e.g., updated FIRM maps, contemporary seismic studies, etc.) or the purchase and installation of new equipment (e.g., backup generators, emergency response equipment, etc.) to ensure they do not have any effect on District hazard vulnerabilities that would impact the conclusions or actions associated with the HMP. Prior to the fifth year of the revision cycle, these annual observations will be reviewed to determine what changes should be implemented in the HMP update. The results of the annual evaluations should be folded back into each phase of the planning process and should yield decisions on how to update each section of the plan.

The SREM department will have the responsibility of implementing these annual and five-year requirements. During the annual review, if any updates are deemed minor, then the SREM department will perform the updates. If more significant updates are required, the Taskforce will be reconvened to discuss the effects of the Plan. For the fifth-year revision, the entire Taskforce will reconvene in order to use their expertise to update the Plan in its entirety.

In addition to these periodic requirements, any significant modification to District facilities should be considered with respect to a possible impact on the HMP. All Taskforce members are responsible for providing an update for the Plan to the SREM department as necessary. As noted in the following section, the completed HMP will be available on EMWD's website to allow the public to continue to be involved during these periodic reviews.

5.5 Update Requirements

§201.6(c)(4)(i): [The plan maintenance process **shall** include a] section describing the method and schedule of monitoring, evaluating, and **updating** the mitigation plan within a five-year cycle.

§201.6(c)(4)(iii): [The plan maintenance process **shall** include a] discussion on how the community will continue public participation in the plan maintenance process.

§201.6(d)(3): [The plan maintenance process **shall** include a] section describing changes in priorities

The Emergency Management and Assistance regulations (44 CFR Part 201) state that it is the responsibility of local agencies to "at a minimum, review and, if necessary, update the local mitigation plan every five years from the date of plan approval to continue program eligibility." As stated in Section 5.4, this responsibility lies with the SREM Director. The evaluation procedures listed below will provide insight into the significant changes that need to be included in the five-year update and resubmission to FEMA.

- Annual HMP review with respect to changes in hazard vulnerability (e.g., additional hazards identified, natural hazard events, etc.)
- Annual HMP review with respect to the development of new facilities
- Five-year comprehensive update to address the findings of the annual reviews
- Re-submittal of the updated HMP to (Cal OES) and FEMA

Additionally, the risk assessment portion of the plan will be reviewed to determine if the information should be updated or modified. Each division/department responsible for the various implementation actions will report on:

- Status of their projects,
- Implementation processes,
- Changes in priority,
- Any difficulties encountered,
- How coordination efforts are proceeding, and
- Which strategies should be revised.

Table 5.6: Action item Implementation

Recommendation Description	Responsible Department	Implementation Timeframe	Status	Details/Status Summary
2023.HMP.01 - Review emergency materials inventory, identify potential gaps, and procure items to improve continuity of operations. Include redundant structural materials to minimize emergency repair time.	• Warehouse	Short	Open	
2023.HMP.02 - Emergency Operations Center upgrades and training. Coordinate training for all EOC responders. Laptops for response and additional technology to improve capabilities	• SREM	Short	Open	
2023.HMP.03 - Continue to upgrade communications systems to ensure interoperability during a disaster.	• SREM	Short	Open	
2023.HMP.04 - Purchase additional satellite phones to improve emergency communications	• SREM	Short	Open	
2023.HMP.05 – Purchase a 40-ton crane to increase EMWD's ability to respond to emergencies and maintain critical infrastructure.	• Water Operations/ Maintenance Services	Medium	Open	
2023.HMP.06 - Continue to conduct analysis of critical facilities to determine level of imperviousness to extreme weather events and utilize the maintenance schedule to make upgrades to improve resiliency	• Water Operations/ Maintenance Services	Long	Open	
2023.HMP.07 - Include considerations for extreme weather (i.e., wind, high heat, excessive rain, etc.) events into new building planning documents	• Water Operations/ Maintenance Services	Medium	Open	
2023.HMP.08 - Continue assessments to elevate at-risk subterranean facilities to above grade locations and ensure future builds are assessed for risk.	• Operations/ Engineering	Ongoing	Open	

Recommendation Description	Responsible Department	Implementation Timeframe	Status	Details/Status Summary
2023.HMP.09 - Continue to identify facilities located within the updated dam inundation zones currently under development by Riverside County and implement mitigation projects as appropriate.	• SREM/ Engineering Services	Short	Open	
2023.HMP.10 - Continue to review and enhance infrastructure maintenance and monitoring schedules to increase the opportunity to identify and repair equipment prior to failure.	• Operations and Maintenance	Ongoing	Open	
2023.HMP.11 - Review brush clearance standards, particularly for facilities in border areas, and identify ways to expand clearance areas. Prioritize those facilities in areas identified as being vulnerable to wildfire.	• Maintenance Services	Short	Open	
2023.HMP.12- Purchase emergency water tenders for use during wildfire/ seismic incidents	• SREM	Long	Open	
2023.HMP.13– Establish a Multi- hazard Response Emergency Response Team; Hazardous Materials, trench rescue, and elevated surface rescue	• SREM	Medium	Open	

A GLOSSARY

Active fault - For implementing Alquist-Priolo Earthquake Fault Zoning Act (APEFZA) requirements, an active fault shows evidence of or is suspected of having experienced surface displacement within the last 11,000 years. APEFZA classification is designed for land use management of surface rupture hazards. A more general definition (National Academy of Science, 1988) states, "a fault that is based on historical, seismological, or geological evidence has the finite probability of producing an earthquake" (see potentially active fault).

Aftershocks - Minor earthquakes following a greater one originates at or near the same place.

Asset - Any man-made or natural feature that has value, including, but not limited to, people, buildings, infrastructure like bridges, roads, and sewer and water systems; lifelines like electricity and communication resources; or environmental, cultural, or recreational features like parks, dunes, wetlands, or landmarks.

A zone - Under the National Flood Insurance Program, an area subject to inundation by the 100-year flood where wave action does not occur or where waves are less than 3 feet high, designated Zone A, AE, A1-A30, A0, AH, or AR on a Flood Insurance Rate Map (FIRM).

Base flood - Flood with a 1 percent probability of being equaled or exceeded in any given year, also known as the 100-year flood.

Bedrock - The solid rock that underlies loose material, such as soil, sand, clay, or gravel.

Contour - A line of equal ground elevation on a topographic (shape) map.

Critical facility - Facilities critical to the population's health and welfare are significant following hazard events. Critical facilities include, but are not limited to, shelters, police and fire stations, and hospitals.

Debris - (Seismic) the scattered remains of something broken or destroyed; ruins; rubble; fragments. (Flooding, Coastal) Solid objects or masses carried by or floating on the surface of moving water.

Debris flow - A saturated, rapidly moving saturated earth flow with 50 percent rock fragments coarser than 2 mm in size, which can occur on natural and graded slopes.

Duration - How long a hazard event lasts.

Earthquake - Vibratory motion propagating within the Earth or along its surface caused by the abrupt release of strain from elastically deformed rock by displacement along a fault.

Epicenter - The point directly above the Earth's surface where an earthquake originated.

Erosion - Under the National Flood Insurance Program, the process of the gradual wearing away of landmasses. In general, erosion involves the detachment and movement of soil and rock fragments, during a flood or storm or over the years, through the action of wind, water, or other geologic processes.

Essential facility – Important elements to ensure full recovery of a community or state following a hazard event. These include government functions, significant employers, banks, schools, and certain commercial establishments, such as grocery stores, hardware stores, and gas stations.

Extent - The size of an area affected by a hazard or hazard event.

Fault - A fracture in the continuity of a rock formation caused by a shifting or dislodging of the earth's crust, in which adjacent surfaces are differentially displaced parallel to the fracture plane.

Fault slip rate - The average long-term movement of a fault (measured in cm/year or mm/year) as determined from geologic evidence.

Federal Emergency Management Agency (FEMA) is - Independent agency created in 1978 to provide a single point of accountability for all Federal activities related to disaster mitigation and emergency preparedness, response, and recovery.

Flash flood - A flood event occurs with little or no warning where water levels rise extremely fast.

Flood - A general and temporary condition of partial or complete inundation of normally dry land areas from (1) the overflow of inland or tidal waters, (2) the unusual and rapid accumulation or runoff of surface waters from any source, or (3) mudflows or the collapse of shoreline land.

Floodplain - Any land area, including watercourse, susceptible to partial or complete inundation by water from any source.

Frequency - A measure of how often events of a particular magnitude are expected to occur. Frequency describes how often a hazard of a specific magnitude, duration, and/or extent typically occurs. Statistically, a hazard with a 100-year recurrence interval is expected to occur once every 100 years on average and would have a 1 percent probability of happening in any given year. The reliability of this information varies depending on the kind of hazard being considered.

Geographic Information Systems (GIS) - A computer software application that relates physical features on the Earth to a database to be used for mapping and analysis.

Ground motion - The vibration or shaking of the ground during an earthquake. When a fault ruptures, seismic waves radiate, causing the ground to vibrate. The severity of the vibration

increases with the amount of energy released and decreases with distance from the causative fault or epicenter, but soft soils can further amplify ground motions.

Ground rupture - Displacement of the earth's surface because of fault movement associated with an earthquake.

Hailstorm – Storm associated with spherical balls of ice. Hail is a product of thunderstorms or intense showers. It is generally white and translucent, consisting of liquid or snow particles encased with layers of ice. Hail is formed within the higher reaches of a well-developed thunderstorm. When hailstones become too heavy to be caught in an updraft back into the clouds of the thunderstorm (hailstones can be caught in numerous updrafts adding a coating of ice to the original frozen droplet of rain each time), they fall as hail, and a hailstorm ensues.

Hazard - A source of potential danger or adverse conditions. Hazards in this how-to series will include naturally occurring events such as floods, earthquakes, tornadoes, tsunamis, coastal storms, landslides, and wildfires that strike populated areas. A natural event is a hazard when it has the potential to harm people or property.

Hazard event - A specific occurrence of a particular type of hazard.

Hazard identification - The process of identifying hazards that threaten an area.

Hazard mitigation - Sustained actions are taken to reduce or eliminate long-term risks from hazards and their effects.

Hazard Mitigation Grant Program (HMGP) – Authorized under Section 404 of the Robert T. Stafford Disaster Relief and Emergency Assistance Act, HMGP is administered by FEMA and provides grants to states, tribes, and local governments to implement hazard mitigation actions after a major disaster declaration. The program's purpose is to reduce the loss of life and property due to disasters and to enable mitigation activities to be implemented as a community recovers from a disaster.

Hazard Mitigation Plan – A collaborative document in which hazards affecting the community are identified, vulnerability to hazards assessed, and the consensus is reached on minimizing or eliminating the effects of these hazards.

Hazard profile - A description of the physical characteristics of hazards and a determination of various descriptors, including magnitude, duration, frequency, probability, and extent. In most cases, a community can most efficiently use these descriptors when they are recorded and displayed as maps.

Hazardous Material Facilities – Facilities housing industrial and hazardous materials, such as corrosives, explosives, flammable materials, radioactive materials, and toxins.

HAZUS (Hazards U.S.) - A GIS-based nationally standardized earthquake loss estimation tool developed by FEMA.

Hurricane - An intense tropical cyclone formed in the atmosphere over warm ocean areas, in which wind speeds reach 74 miles per hour or more and blow in a large spiral around a relatively calm center or "eye." Hurricanes develop over the North Atlantic Ocean, northeast Pacific Ocean, or the South Pacific Ocean east of 160°E longitude. Hurricane circulation is counterclockwise in the Northern Hemisphere and clockwise in the Southern Hemisphere.

Hydrology – the science dealing with water's properties, distribution, and circulation on and below the earth's surface and in the atmosphere.

Infrastructure - Refers to a community's public services that directly impact the quality of life. Infrastructure includes communication technology such as phone lines or Internet access, vital services such as public water supplies and sewer treatment facilities and consists of an area's transportation system such as airports, heliports; highways, bridges, tunnels, roadbeds, overpasses, railways, bridges, rail yards, depots; and waterways, canals, locks, seaports, ferries, harbors, drydocks, piers and regional dams.

Landslide - A general term covering a wide variety of mass-movement landforms and processes involving the downslope transport, under the gravitational influence, of soil and rock material in masse.

Liquefaction - Changing soils (unconsolidated alluvium) from a solid state to a weaker state unable to support structures, where the material behaves similar to a liquid due to earthquake shaking. The transformation of cohesionless soils from a solid or liquid state results from increased pore pressure and reduced effective stress.

Magnitude - A measure of the strength of a hazard event. The magnitude (also called severity) of a given hazard event is usually determined using technical measures specific to the hazard.

Mitigation plan - A systematic evaluation of the nature and extent of vulnerability to the effects of natural hazards typically present in the state and includes a description of actions to minimize future vulnerability to hazards.

Nor'easter - An extra-tropical cyclone is producing gale-force winds and precipitation in the form of heavy snow or rain.

Peak Ground Acceleration (PGA) - The most significant amplitude of acceleration measured for a single frequency on an earthquake accelerogram. An earthquake generates the maximum horizontal ground motion. The measure of this motion is the acceleration of gravity (equal to 32 feet per second squared, or 980 centimeters per second squared) and is generally expressed as a percentage of gravity.

Potentially active fault - A fault showing evidence of movement within the last 1.6 million years (750,000 years according to the U.S. Geological Survey) but before about 11,000 years ago, and that can generate damaging earthquakes.

Probability is a statistical measure of the likelihood of a hazard event.

Replacement value - The cost of rebuilding a structure. This is usually expressed in terms of cost per square foot and reflects the present-day cost of labor and materials to construct a building of a particular size, type, and quality.

Retrofit - Any change made to an existing structure to reduce or eliminate damage to that structure from flooding, erosion, high winds, earthquakes, or other hazards.

Richter scale - A numerical scale of earthquake magnitude devised by seismologist C.F. Richter in 1935. Seismologists no longer use this magnitude scale because of limitations in how it measures large earthquakes and prefer to use moment magnitude as a measure of the energy released during an earthquake.

Risk - The estimated impact a hazard would have on people, services, facilities, and structures in a community; the likelihood of a hazard resulting in an adverse condition that causes injury or damage. Risk is often expressed in relative terms, such as a high, moderate, or low likelihood of sustaining damage above a particular threshold due to a specific type of hazard event. It also can be expressed in terms of potential monetary losses associated with the intensity of the hazard.

Seismicity - Describes the likelihood of an area being subject to earthquakes.

Tectonic plate - Torsionally rigid, thin segments of the earth's lithosphere that may be assumed to move horizontally and adjoin other plates. It is the friction between plate boundaries that causes seismic activity.

Topographic - Characterizes maps that show natural features and indicate the physical shape of the land using contour lines. These maps may also include manmade features.

Tornado - A violently rotating column of air extending from a thunderstorm to the ground.

Tsunami-Great Sea waves are produced by submarine earthquakes, landslides, or volcanic eruptions.

Vulnerability - Describes how exposed or susceptible to damage an asset is. Vulnerability depends on an asset's construction, contents, and the economic value of its functions. Like indirect damage, the vulnerability of one community element is often related to the vulnerability of another. For example, many businesses depend on uninterrupted electrical power – if an electric substation is flooded, it will affect not only the substation itself but several businesses. Often, indirect effects can be much more widespread and damaging than direct ones.

Vulnerability assessment - The extent of injury and damage that may result from a hazard event of intensity in each area. The vulnerability assessment should address the impacts of hazard events on the existing and future built environment.

Wildfire - An uncontrolled fire spreading through vegetative fuels, exposing and possibly consuming structures.

Zone - A geographical area is shown on a Flood Insurance Rate Map.

100-year flood – A flood that has a 1-percent chance of being equaled or exceeded in any given year. This flood event is also referred to as the base flood. The term "100-year flood" can be misleading; it is not the flood that will occur once every 100 years. Rather, it is the flood elevation that has a 1- percent chance of being equaled or exceeded each year. Therefore, the 100-year flood could occur more than once in a relatively short period of time. The 100-year flood, which is the standard used by most federal and state agencies, is used by the National Flood Insurance Program (NFIP) as the standard for floodplain management to determine the need for flood insurance.

500-year flood – A flood that has a 0.2-percent chance of being equaled or exceeded in any one year.

B REGULATIONS

The Disaster Mitigation Act of 2000 (P.L. 106-390) facilitates a new and revitalized approach to mitigation planning. DMA 2000 amended the Robert T. Stafford Disaster Relief and Emergency Assistance Act by repealing the previous mitigation planning provisions (Section 409) and replacing them with a new set of mitigation plan requirements (Section 322). This new section emphasizes the need for state, Tribal, and local entities to closely coordinate mitigation planning and implementation efforts. The following pages provide a description of the Disaster Mitigation Act of 2000, as well as the Interim Final Rule for mitigation planning; CFR 44 sections 201 and 206.

Title 44 —Emergency Management and Assistance
Chapter I —Federal Emergency Management Agency, Department of Homeland Security
Subchapter D —Disaster Assistance

PART 201—MITIGATION PLANNING

Authority: Robert T. Stafford Disaster Relief and Emergency Assistance Act, 42 U.S.C. 5121 through 5207; Homeland Security Act of 2002, 6 U.S.C. 101; National Flood Insurance Act of 1968, 42 U.S.C. 4104c.

Source: 67 FR 8848, Feb. 26, 2002, unless otherwise noted.

§ 201.1 Purpose.

(a) The purpose of this part is to provide information on the policies and procedures for mitigation planning as required by the provisions of section 322 of the Stafford Act, 42 U.S.C. 5165, and section 1366 of the National Flood Insurance Act of 1968, 42 U.S.C. 4104c.

(b) The purpose of mitigation planning is for State, local, and Indian tribal governments to identify the natural hazards that impact them, to identify actions and activities to reduce any losses from those hazards, and to establish a coordinated process to implement the plan, taking advantage of a wide range of resources.

[67 FR 8848, Feb. 26, 2002, as amended at 86 FR 50673, Sept. 10, 2021]

§ 201.2 Definitions.

Administrator means the head of the Federal Emergency Management Agency, or his/her designated representative.

Applicant means the entity applying to FEMA for a Federal award that will be accountable for the use of funds.

Federal award means the Federal financial assistance that a recipient or subrecipient receives directly from FEMA or indirectly from a pass-through entity. The term "grant" or "award" may also be used to describe a Federal award under this part.

Flood Mitigation Assistance (FMA) means the program authorized by section 1366 of the National Flood Insurance Act of 1968, as amended, 42 U.S.C. 4104c, and implemented at part 77.

Hazard mitigation means any sustained action taken to reduce or eliminate the long-term risk to human life and property from hazards.

Hazard Mitigation Grant Program (HMGP) means the program authorized under section 404 of the Robert T. Stafford Disaster Relief and Emergency Assistance Act, 42 U.S.C. 5170c, and implemented at part 206, subpart N of this chapter.

Indian Tribal government means any Federally recognized governing body of an Indian or Alaska Native Tribe, band, nation, pueblo, village, or community that the Secretary of Interior acknowledges to exist as an Indian Tribe under the Federally Recognized Indian Tribe List Act of 1994, 25 U.S.C. 5131. This does not include Alaska Native corporations, the ownership of which is vested in private individuals.

Local government is any county, municipality, city, town, township, public authority, school district, special district, intrastate district, council of governments (regardless of whether the council of governments is incorporated as a nonprofit corporation under State law), regional or interstate government entity, or agency or instrumentality of a local government; any Indian Tribe or authorized Tribal organization, or Alaska Native village or organization; and any rural community, unincorporated town or village, or other public entity.

Managing State means a State to which FEMA has delegated the authority to administer and manage the HMGP under the criteria established by FEMA pursuant to 42 U.S.C. 5170c(c). FEMA may also delegate authority to Tribal governments to administer and manage the HMGP as a Managing State.

Pass-through entity means a recipient that provides a subaward to a subrecipient to carry out part of a Federal program.

Pre-Disaster Mitigation Program (PDM) means the program authorized under section 203 of the Robert T. Stafford Disaster Relief and Emergency Assistance Act, 42 U.S.C. 5133.

Recipient means the government that receives a Federal award directly from FEMA. A recipient may also be a pass-through entity. The term recipient does not include subrecipients. The recipient is the entire legal entity even if only a particular component of the entity is designated in the grant award document. Generally, the State is the recipient. However, an Indian Tribal government may choose to be a recipient, or may act as a subrecipient under the State. An Indian Tribal government acting as recipient will assume the responsibilities of a "State", as described in this part, for the purposes of administering the grant.

Regional Administrator means the head of a Federal Emergency Management Agency regional office, or his/her designated representative.

Repetitive loss structure means a structure as defined at § 77.2 of this chapter.

Severe repetitive loss structure is a structure as defined at § 77.2 of this chapter.

Small and impoverished communities means a community of 3,000 or fewer individuals that is identified by the State as a rural community, and is not a remote area within the corporate boundaries of a larger city; is economically disadvantaged, by having an average per capita annual income of residents not exceeding 80 percent of national, per capita income, based on best available data; the local unemployment rate exceeds by one percentage point or more, the most recently reported, average yearly national unemployment rate; and any other factors identified in the State Plan in which the community is located.

The Stafford Act refers to the Robert T. Stafford Disaster Relief and Emergency Assistance Act, Public Law 93–288, as amended (42 U.S.C. 5121–5207).

State is any State of the United States, the District of Columbia, the Commonwealth of Puerto Rico, the U.S. Virgin Islands, Guam, American Samoa, and the Commonwealth of the Northern Mariana Islands.

State Hazard Mitigation Officer is the official representative of State government who is the primary point of contact with FEMA, other Federal agencies, and local governments in mitigation planning and implementation of mitigation programs and activities required under the Stafford Act.

Subapplicant means an entity submitting a subapplication to the applicant for a subaward to carry out part of a Federal award.

Subaward means an award provided by a pass-through entity to a subrecipient for the subrecipient to carry out part of a Federal award.

Subrecipient means the entity that receives a subaward from a pass-through entity. Depending on the program, subrecipients of hazard mitigation assistance subawards can be a State agency, local government, private nonprofit organization, or Indian Tribal government. Subrecipients of FMA subawards can be a State agency, community, or Indian Tribal government, as described in 44 CFR part 77. Indian Tribal governments acting as a subrecipient are accountable to the State recipient.

[86 FR 50673, Sept. 10, 2021]

§ 201.3 Responsibilities.

(a) *General.* This section identifies the key responsibilities of FEMA, States, and local/Tribal governments in carrying out section 322 of the Stafford Act, 42 U.S.C. 5165.

(b) *FEMA.* The key responsibilities of the Regional Administrator are to:

(1) Oversee all FEMA related pre- and post-disaster hazard mitigation programs and activities;

(2) Provide technical assistance and training to State, local, and Indian Tribal governments regarding the mitigation planning process;

(3) Review and approve all Standard and Enhanced State Mitigation Plans;

(4) Review and approve all local mitigation plans, unless that authority has been delegated to the State in accordance with § 201.6(d);

(5) Conduct reviews, at least once every 5 years, of State mitigation activities, plans, and programs to ensure that mitigation commitments are fulfilled, and when necessary, take action, including recovery of funds or denial of future funds, if mitigation commitments are not fulfilled.

(c) *State.* The key responsibilities of the State are to coordinate all State and local activities relating to hazard evaluation and mitigation and to:

(1) Prepare and submit to FEMA a Standard State Mitigation Plan following the criteria established in § 201.4 as a condition of receiving non-emergency Stafford Act assistance and FEMA mitigation grants. In accordance with § 77.6(b) of this chapter, applicants and subapplicants for FMA project grants must have a FEMA-approved mitigation plan that addresses identified flood hazards and provides for reduction of flood losses to structures for which NFIP coverage is available.

(2) In order to be considered for the 20 percent HMGP funding, prepare and submit an Enhanced State Mitigation Plan in accordance with § 201.5, which must be reviewed and updated, if necessary, every 5 years from the date of the approval of the previous plan.

(3) At a minimum, review and update the Standard State Mitigation Plan every 5 years from the date of the approval of the previous plan in order to continue program eligibility.

(4) Make available the use of up to the 7 percent of HMGP funding for planning in accordance with § 206.434.

(5) Provide technical assistance and training to local governments to assist them in applying for HMGP planning grants, and in developing local mitigation plans.

(6) For Managing States that have been approved under the criteria established by FEMA pursuant to 42 U.S.C. 5170c(c), review and approve local mitigation plans in accordance with § 201.6(d).

(d) *Local governments.* The key responsibilities of local governments are to:

(1) Prepare and adopt a jurisdiction-wide natural hazard mitigation plan as a condition of receiving project grant funds under the HMGP, in accordance with § 201.6.

(2) At a minimum, review and update the local mitigation plan every 5 years from date of plan approval of the previous plan in order to continue program eligibility.

(e) *Indian tribal governments.* The key responsibilities of the Indian tribal government are to coordinate all tribal activities relating to hazard evaluation and mitigation and to:

(1) Prepare and submit to FEMA a Tribal Mitigation Plan following the criteria established in § 201.7 as a condition of receiving non-emergency Stafford Act assistance and FEMA mitigation grants as a recipient. This plan will also allow Indian Tribal governments to apply through the State, as a subrecipient, for any FEMA mitigation project grant. In accordance with § 77.6(b) of this chapter, applicants and subapplicants for FMA project grants must have a FEMA-approved mitigation plan that addresses identified flood hazards and provides for reduction of flood losses to structures for which NFIP coverage is available.

(2) Review and update the Tribal Mitigation Plan at least every 5 years from the date of approval of the previous plan in order to continue program eligibility.

(3) In order to be considered for the increased HMGP funding, the Tribal Mitigation Plan must meet the Enhanced State Mitigation Plan criteria identified in § 201.5. The plan must be reviewed and updated at least every 5 years from the date of approval of the previous plan.

[67 FR 8848, Feb. 26, 2002, as amended at 67 FR 61515, Oct. 1, 2002; 69 FR 55096, Sept. 13, 2004; 72 FR 61748, Oct. 31, 2007; 74 FR 47482, Sept. 16, 2009; 79 FR 22882, Apr. 25, 2014; 86 FR 50673, Sept. 10, 2021]

§ 201.4 Standard State Mitigation Plans.

(a) *Plan requirement.* States must have an approved Standard State Mitigation Plans meeting the requirements of this section as a condition of receiving non-emergency Stafford Act assistance and FEMA mitigation grants. Emergency assistance provided under 42 U.S.C. 5170a, 5170b, 5173, 5174, 5177, 5179, 5180, 5182, 5183, 5184, 5192 will not be affected. Mitigation planning grants provided through the Pre-disaster Mitigation (PDM) program, authorized under section 203 of the Stafford Act, 42 U.S.C. 5133,

will also continue to be available. The mitigation plan is the demonstration of the State's commitment to reduce risks from natural hazards and serves as a guide for State decision makers as they commit resources to reducing the effects of natural hazards.

(b) *Planning process.* An effective planning process is essential in developing and maintaining a good plan. The mitigation planning process should include coordination with other State agencies, appropriate Federal agencies, interested groups, and be integrated to the extent possible with other ongoing State planning efforts as well as other FEMA mitigation programs and initiatives.

(c) *Plan content.* To be effective the plan must include the following elements:

(1) Description of the *planning process* used to develop the plan, including how it was prepared, who was involved in the process, and how other agencies participated.

(2) Statewide *risk assessments* that provide the factual basis for activities proposed in the strategy portion of the mitigation plan. Statewide risk assessments must characterize and analyze natural hazards and risks to provide a statewide overview. This overview will allow the State to compare potential losses throughout the State and to determine their priorities for implementing mitigation measures under the strategy, and to prioritize jurisdictions for receiving technical and financial support in developing more detailed local risk and vulnerability assessments. The risk assessment must include the following:

(i) An overview of the type and location of all natural hazards that can affect the State, including information on previous occurrences of hazard events, as well as the probability of future hazard events, using maps where appropriate;

(ii) An overview and analysis of the State's vulnerability to the hazards described in this paragraph (c)(2), based on estimates provided in local risk assessments as well as the State risk assessment. The State must describe vulnerability in terms of the jurisdictions most threatened by the identified hazards, and most vulnerable to damage and loss associated with hazard events. State owned or operated critical facilities located in the identified hazard areas must also be addressed;

(iii) An overview and analysis of potential losses to the identified vulnerable structures, based on estimates provided in local risk assessments as well as the State risk assessment. The State must estimate the potential dollar losses to State owned or operated buildings, infrastructure, and critical facilities located in the identified hazard areas.

(3) A *Mitigation Strategy* that provides the State's blueprint for reducing the losses identified in the risk assessment. This section must include:

(i) A description of State goals to guide the selection of activities to mitigate and reduce potential losses.

(ii) A discussion of the State's pre- and post-disaster hazard management policies, programs, and capabilities to mitigate the hazards in the area, including: An evaluation of State laws, regulations, policies, and programs related to hazard mitigation as well as to development in hazard-prone areas; a discussion of State funding capabilities for hazard mitigation projects; and a general description and analysis of the effectiveness of local mitigation policies, programs, and capabilities.

(iii) An identification, evaluation, and prioritization of cost-effective, environmentally sound, and technically feasible mitigation actions and activities the State is considering and an explanation of how each activity contributes to the overall mitigation strategy. This section should be linked to local plans, where specific local actions and projects are identified.

(iv) Identification of current and potential sources of Federal, State, local, or private funding to implement mitigation activities.

(v) In accordance with § 77.6(b) of this chapter, applicants and subapplicants for FMA project grants must have a FEMA-approved mitigation plan that addresses identified flood hazards and provides for reduction of flood losses to structures for which NFIP coverage is available.

(4) A section on the *Coordination of Local Mitigation Planning* that includes the following:

(i) A description of the State process to support, through funding and technical assistance, the development of local mitigation plans.

(ii) A description of the State process and timeframe by which the local plans will be reviewed, coordinated, and linked to the State Mitigation Plan.

(iii) Criteria for prioritizing communities and local jurisdictions that would receive planning and project grants under available funding programs, which should include consideration for communities with the highest risks, repetitive loss structures, and most intense development pressures. Further, that for non-planning grants, a principal criterion for prioritizing grants will be the extent to which benefits are maximized according to a cost benefit review of proposed projects and their associated costs.

(5) A *Plan Maintenance Process* that includes:

(i) An established method and schedule for monitoring, evaluating, and updating the plan.

(ii) A system for monitoring implementation of mitigation measures and project closeouts.

(iii) A system for reviewing progress on achieving goals as well as activities and projects identified in the Mitigation Strategy.

(6) A *Plan Adoption Process.* The plan must be formally adopted by the State prior to submittal to us for final review and approval.

(7) ***Assurances.*** The plan must include assurances that the State will comply with all applicable Federal statutes and regulations in effect with respect to the periods for which it receives grant funding, including 2 CFR parts 200 and 3002. The State will amend its plan whenever necessary to reflect changes in State or Federal statutes and regulations.

(d) ***Review and updates.*** Plan must be reviewed and revised to reflect changes in development, progress in statewide mitigation efforts, and changes in priorities and resubmitted for approval to the appropriate Regional Administrator every 5 years. The Regional review will be completed within 45 days after receipt from the State, whenever possible. We also encourage a State to review its plan in the post-disaster timeframe to reflect changing priorities, but it is not required.

[67 FR 8848, Feb. 26, 2002, as amended at 67 FR 61515, Oct. 1, 2002; 69 FR 55096, Sept. 13, 2004; 72 FR 61565, 61738, Oct. 31, 2007; 79 FR 22883, Apr. 25, 2014; 79 FR 76085, Dec. 19, 2014; 80 FR 59551, Oct. 2, 2015; 86 FR 50674, Sept. 10, 2021]

§ 201.5 Enhanced State Mitigation Plans.

(a) A State with a FEMA approved Enhanced State Mitigation Plan at the time of a disaster declaration is eligible to receive increased funds under the HMGP, based on twenty percent of the total estimated eligible Stafford Act disaster assistance. The Enhanced State Mitigation Plan must demonstrate that a State has developed a comprehensive mitigation program, that the State effectively uses available mitigation funding, and that it is capable of managing the increased funding. In order for the State to be eligible for the 20 percent HMGP funding, FEMA must have approved the plan within 5 years prior to the disaster declaration.

(b) Enhanced State Mitigation Plans must include all elements of the Standard State Mitigation Plan identified in § 201.4, as well as document the following:

(1) Demonstration that the plan is integrated to the extent practicable with other State and/or regional planning initiatives (comprehensive, growth management, economic development, capital improvement, land development, and/or emergency management plans) and FEMA mitigation programs and initiatives that provide guidance to State and regional agencies.

(2) Documentation of the State's project implementation capability, identifying and demonstrating the ability to implement the plan, including:

(i) Established eligibility criteria for multi-hazard mitigation measures.

(ii) A system to determine the cost effectiveness of mitigation measures, consistent with OMB Circular A–94, Guidelines and Discount Rates for Benefit-Cost Analysis of Federal Programs, and to rank the measures according to the State's eligibility criteria.

(iii) Demonstration that the State has the capability to effectively manage the HMGP as well as other mitigation grant programs, including a record of the following:

(A) Meeting HMGP and other mitigation grant application timeframes and submitting complete, technically feasible, and eligible project applications with appropriate supporting documentation;

(B) Preparing and submitting accurate environmental reviews and benefit-cost analyses;

(C) Submitting complete and accurate quarterly progress and financial reports on time; and

(D) Completing HMGP and other mitigation grant projects within established performance periods, including financial reconciliation.

(iv) A system and strategy by which the State will conduct an assessment of the completed mitigation actions and include a record of the effectiveness (actual cost avoidance) of each mitigation action.

(3) Demonstration that the State effectively uses existing mitigation programs to achieve its mitigation goals.

(4) Demonstration that the State is committed to a comprehensive state mitigation program, which might include any of the following:

(i) A commitment to support local mitigation planning by providing workshops and training, State planning grants, or coordinated capability development of local officials, including Emergency Management and Floodplain Management certifications.

(ii) A statewide program of hazard mitigation through the development of legislative initiatives, mitigation councils, formation of public/private partnerships, and/or other executive actions that promote hazard mitigation.

(iii) The State provides a portion of the non-Federal match for HMGP and/or other mitigation projects.

(iv) To the extent allowed by State law, the State requires or encourages local governments to use a current version of a nationally applicable model building code or standard that addresses natural hazards as a basis for design and construction of State sponsored mitigation projects.

(v) A comprehensive, multi-year plan to mitigate the risks posed to existing buildings that have been identified as necessary for post-disaster response and recovery operations.

(vi) A comprehensive description of how the State integrates mitigation into its post-disaster recovery operations.

(c) *Review and updates.*

(1) A State must review and revise its plan to reflect changes in development, progress in statewide mitigation efforts, and changes in priorities, and resubmit it for approval to the appropriate Regional Administrator every 5 years. The Regional review will be completed within 45 days after receipt from the State, whenever possible.

(2) In order for a State to be eligible for the 20 percent HMGP funding, the Enhanced State Mitigation plan must be approved by FEMA within the 5 years prior to the current major disaster declaration.

[67 FR 8848, Feb. 26, 2002, as amended at 79 FR 22883, Apr. 25, 2014]

§ 201.6 Local Mitigation Plans.

The local mitigation plan is the representation of the jurisdiction's commitment to reduce risks from natural hazards, serving as a guide for decision makers as they commit resources to reducing the effects of natural hazards. Local plans will also serve as the basis for the State to provide technical assistance and to prioritize project funding.

(a) *Plan requirements.*

(1) A local government must have a mitigation plan approved pursuant to this section in order to receive HMGP project grants. A local government must have a mitigation plan approved pursuant to this section in order to apply for and receive mitigation project grants under all other mitigation grant programs.

(2) Plans prepared for the FMA program, described at part 77 of this chapter, need only address these requirements as they relate to flood hazards in order to be eligible for FMA project grants. However, these plans must be clearly identified as being flood mitigation plans, and they will not meet the eligibility criteria for other mitigation grant programs, unless flooding is the only natural hazard the jurisdiction faces.

(3) Regional Administrators may grant an exception to the plan requirement in extraordinary circumstances, such as in a small and impoverished community, when justification is provided. In these cases, a plan will be completed within 12 months of the award of the project grant. If a plan is not provided within this timeframe, the project grant will be terminated, and any costs incurred after notice of grant's termination will not be reimbursed by FEMA.

(4) Multi-jurisdictional plans (*e.g.*, watershed plans) may be accepted, as appropriate, as long as each jurisdiction has participated in the process and has officially adopted the plan. State-wide plans will not be accepted as multi-jurisdictional plans.

(b) *Planning process.* An open public involvement process is essential to the development of an effective plan. In order to develop a more comprehensive approach to reducing the effects of natural disasters, the planning process must include:

(1) An opportunity for the public to comment on the plan during the drafting stage and prior to plan approval;

(2) An opportunity for neighboring communities, local and regional agencies involved in hazard mitigation activities, and agencies that have the authority to regulate development, as well as businesses, academia and other private and nonprofit interests to be involved in the planning process; and

(3) Review and incorporation, if appropriate, of existing plans, studies, reports, and technical information.

(c) *Plan content.* The plan must include the following:

(1) Documentation of the *planning process* used to develop the plan, including how it was prepared, who was involved in the process, and how the public was involved.

(2) A *risk assessment* that provides the factual basis for activities proposed in the strategy to reduce losses from identified hazards. Local risk assessments must provide sufficient information to enable the jurisdiction to identify and prioritize appropriate mitigation actions to reduce losses from identified hazards. The risk assessment must include:

(i) A description of the type, location, and extent of all natural hazards that can affect the jurisdiction. The plan must include information on previous occurrences of hazard events and on the probability of future hazard events.

(ii) A description of the jurisdiction's vulnerability to the hazards described in paragraph (c)(2)(i) of this section. This description must include an overall summary of each hazard and its impact on the community. All plans approved after October 1, 2008 must also address NFIP insured structures that have been repetitively damaged by floods. The plan should describe vulnerability in terms of:

(A) The types and numbers of existing and future buildings, infrastructure, and critical facilities located in the identified hazard areas;

(B) An estimate of the potential dollar losses to vulnerable structures identified in paragraph (c)(2)(ii)(A) of this section and a description of the methodology used to prepare the estimate;

(C) Providing a general description of land uses and development trends within the community so that mitigation options can be considered in future land use decisions.

(iii) For multi-jurisdictional plans, the risk assessment section must assess each jurisdiction's risks where they vary from the risks facing the entire planning area.

(3) A *mitigation strategy* that provides the jurisdiction's blueprint for reducing the potential losses identified in the risk assessment, based on existing authorities, policies, programs and resources, and its ability to expand on and improve these existing tools. This section must include:

(i) A description of mitigation goals to reduce or avoid long-term vulnerabilities to the identified hazards.

(ii) A section that identifies and analyzes a comprehensive range of specific mitigation actions and projects being considered to reduce the effects of each hazard, with particular emphasis on new and existing buildings and infrastructure. All plans approved by FEMA after October 1, 2008, must also address the jurisdiction's participation in the NFIP, and continued compliance with NFIP requirements, as appropriate.

(iii) An action plan describing how the actions identified in paragraph (c)(3)(ii) of this section will be prioritized, implemented, and administered by the local jurisdiction. Prioritization will include a special emphasis on the extent to which benefits are maximized according to a cost benefit review of the proposed projects and their associated costs.

(iv) For multi-jurisdictional plans, there must be identifiable action items specific to the jurisdiction requesting FEMA approval or credit of the plan.

(4) A *plan maintenance process* that includes:

(i) A section describing the method and schedule of monitoring, evaluating, and updating the mitigation plan within a five-year cycle.

(ii) A process by which local governments incorporate the requirements of the mitigation plan into other planning mechanisms such as comprehensive or capital improvement plans, when appropriate.

(iii) Discussion on how the community will continue public participation in the plan maintenance process.

(5) *Documentation* that the plan has been formally adopted by the governing body of the jurisdiction requesting approval of the plan (*e.g.*, City Council, County Commissioner, Tribal Council). For multi-jurisdictional plans, each jurisdiction requesting approval of the plan must document that it has been formally adopted.

(d) *Plan review.*

(1) Plans must be submitted to the State Hazard Mitigation Officer (SHMO) for initial review and coordination. The State will then send the plan to the appropriate FEMA Regional Office for formal review and approval. Where the State point of contact for the FMA program is different from the SHMO, the SHMO will be responsible for coordinating the local plan reviews between the FMA point of contact and FEMA.

(2) The Regional review will be completed within 45 days after receipt from the State, whenever possible.

(3) A local jurisdiction must review and revise its plan to reflect changes in development, progress in local mitigation efforts, and changes in priorities, and resubmit it for approval within 5 years in order to continue to be eligible for mitigation project grant funding.

(4) Managing States that have been approved under the criteria established by FEMA pursuant to 42 U.S.C. 5170c(c) will be delegated approval authority for local mitigation plans, and the review will be based on the criteria in this part. Managing States will review the plans within 45 days of receipt of the plans, whenever possible, and provide a copy of the approved plans to the Regional Office.

[67 FR 8848, Feb. 26, 2002, as amended at 67 FR 61515, Oct. 1, 2002; 68 FR 61370, Oct. 28, 2003; 69 FR 55096, Sept. 13, 2004; 72 FR 61748, Oct. 31, 2007 ; 74 FR 47482, Sept. 16, 2009; 86 FR 50674, Sept. 10, 2021]

§ 201.7 Tribal Mitigation Plans.

The Indian Tribal Mitigation Plan is the representation of the Indian tribal government's commitment to reduce risks from natural hazards, serving as a guide for decision makers as they commit resources to reducing the effects of natural hazards.

(a) ***Plan requirement.***

(1) Indian Tribal governments applying to FEMA as a recipient must have an approved Tribal Mitigation Plan meeting the requirements of this section as a condition of receiving non-emergency Stafford Act assistance and FEMA mitigation grants. Emergency assistance provided under 42 U.S.C. 5170a, 5170b, 5173, 5174, 5177, 5179, 5180, 5182, 5183, 5184, 5192 will not be affected. Mitigation planning grants provided through the PDM program, authorized under section 203 of the Stafford Act, 42 U.S.C. 5133, will also continue to be available.

(2) Indian Tribal governments applying through the State as a subrecipient must have an approved Tribal Mitigation Plan meeting the requirements of this section in order to receive HMGP project grants. A Tribe must have an approved Tribal Mitigation Plan in order to apply for and receive FEMA mitigation project grants, under all other mitigation grant programs. The provisions in § 201.6(a)(3) are available to Tribes applying as subrecipients.

(3) Multi-jurisdictional plans (*e.g.*, county-wide or watershed plans) may be accepted, as appropriate, as long as the Indian Tribal government has participated in the process and has officially adopted the plan. Indian Tribal governments must address all the elements identified in this section to ensure eligibility as a recipient or as a subrecipient.

(b) An effective planning process is essential in developing and maintaining a good plan. The mitigation planning process should include coordination with other tribal agencies, appropriate Federal agencies, adjacent jurisdictions, interested groups, and be integrated to the extent possible with other ongoing tribal planning efforts as well as other FEMA mitigation programs and initiatives.

(c) ***Plan content.*** The plan must include the following:

(1) Documentation of the *planning process* used to develop the plan, including how it was prepared, who was involved in the process, and how the public was involved. This must include:

(i) An opportunity for the public to comment on the plan during the drafting stage and prior to plan approval, including a description of how the Indian Tribal government defined "public;"

(ii) As appropriate, an opportunity for neighboring communities, Tribal and regional agencies involved in hazard mitigation activities, and agencies that have the authority to regulate development, as well as businesses, academia, and other private and nonprofit interests to be involved in the planning process;

(iii) Review and incorporation, if appropriate, of existing plans, studies, and reports; and

(iv) Be integrated to the extent possible with other ongoing Tribal planning efforts as well as other FEMA programs and initiatives.

(2) A *risk assessment* that provides the factual basis for activities proposed in the strategy to reduce losses from identified hazards. Tribal risk assessments must provide sufficient information to enable the Indian Tribal government to identify and prioritize appropriate mitigation actions to reduce losses from identified hazards. The risk assessment must include:

(i) A description of the type, location, and extent of all natural hazards that can affect the Tribal planning area. The plan must include information on previous occurrences of hazard events and on the probability of future hazard events.

(ii) A description of the Indian Tribal government's vulnerability to the hazards described in paragraph (c)(2)(i) of this section. This description must include an overall summary of each hazard and its impact on the Tribe. The plan should describe vulnerability in terms of:

(A) The types and numbers of existing and future buildings, infrastructure, and critical facilities located in the identified hazard areas;

(B) An estimate of the potential dollar losses to vulnerable structures identified in paragraph (c)(2)(ii)(A) of this section and a description of the methodology used to prepare the estimate;

(C) A general description of land uses and development trends within the Tribal planning area so that mitigation options can be considered in future land use decisions; and

(D) Cultural and sacred sites that are significant, even if they cannot be valued in monetary terms.

(3) A *mitigation strategy* that provides the Indian Tribal government's blueprint for reducing the potential losses identified in the risk assessment, based on existing authorities, policies, programs and resources, and its ability to expand on and improve these existing tools. This section must include:

(i) A description of mitigation goals to reduce or avoid long-term vulnerabilities to the identified hazards.

(ii) A section that identifies and analyzes a comprehensive range of specific mitigation actions and projects being considered to reduce the effects of each hazard, with particular emphasis on new and existing buildings and infrastructure.

(iii) An action plan describing how the actions identified in paragraph (c)(3)(ii) of this section will be prioritized, implemented, and administered by the Indian Tribal government.

(iv) A discussion of the Indian Tribal government's pre- and post-disaster hazard management policies, programs, and capabilities to mitigate the hazards in the area, including: An evaluation of Tribal laws, regulations, policies, and programs related to hazard mitigation as well as to development in hazard-prone areas; and a discussion of Tribal funding capabilities for hazard mitigation projects.

(v) Identification of current and potential sources of Federal, Tribal, or private funding to implement mitigation activities.

(vi) In accordance with § 77.6(b) of this chapter, applicants and subapplicants for FMA project grants must have a FEMA-approved mitigation plan that addresses identified flood hazards and provides for reduction of flood losses to structures for which NFIP coverage is available.

(4) A *plan maintenance process* that includes:

(i) A section describing the method and schedule of monitoring, evaluating, and updating the mitigation plan.

(ii) A system for monitoring implementation of mitigation measures and project closeouts.

(iii) A process by which the Indian Tribal government incorporates the requirements of the mitigation plan into other planning mechanisms such as reservation master plans or capital improvement plans, when appropriate.

(iv) Discussion on how the Indian Tribal government will continue public participation in the plan maintenance process.

(v) A system for reviewing progress on achieving goals as well as activities and projects identified in the mitigation strategy.

(5) The plan must be formally adopted by the governing body of the Indian Tribal government prior to submittal to FEMA for final review and approval.

(6) The plan must include assurances that the Indian Tribal government will comply with all applicable Federal statutes and regulations in effect with respect to the periods for which it receives grant funding, including 2 CFR parts 200 and 3002. The Indian Tribal government will amend its plan whenever necessary to reflect changes in Tribal or Federal laws and statutes.

(d) *Plan review and updates.*

(1) Plans must be submitted to the appropriate FEMA Regional Office for formal review and approval. Indian Tribal governments who would like the option of being a subrecipient under the State must also submit their plan to the State Hazard Mitigation Officer for review and coordination.

(2) The Regional review will be completed within 45 days after receipt from the Indian Tribal government, whenever possible.

(3) Indian Tribal governments must review and revise their plan to reflect changes in development, progress in local mitigation efforts, and changes in priorities, and resubmit it for approval within 5 years in order to continue to be eligible for non-emergency Stafford Act assistance and FEMA mitigation grant funding.

[72 FR 61749, Oct. 31, 2007, as amended at 74 FR 47482, Sept. 16, 2009; 79 FR 76085, Dec. 19, 2014; 80 FR 59551, Oct. 2, 2015; 86 FR 50675, Sept. 10, 2021]

Title 44 —Emergency Management and Assistance

Chapter I —Federal Emergency Management Agency, Department of Homeland Security

Subchapter D —Disaster Assistance

Part 206 —Federal Disaster Assistance

Authority: Robert T. Stafford Disaster Relief and Emergency Assistance Act, 42 U.S.C. 5121 through 5207; Homeland Security Act of 2002, 6 U.S.C. 101 *et seq.*; Department of Homeland Security Delegation 9001.1; sec. 1105, Pub. L. 113–2, 127 Stat. 43 (42 U.S.C. 5189a note).

Source: 54 FR 11615, Mar. 21, 1989, unless otherwise noted.

Subpart N Hazard Mitigation Grant Program

Subpart N—Hazard Mitigation Grant Program

Source: 55 FR 35537, Aug. 30, 1990, unless otherwise noted.

§ 206.430 General.

This subpart provides guidance on the administration of hazard mitigation grants made under the provisions of section 404 of the Robert T. Stafford Disaster Relief and Emergency Assistance Act, 42 U.S.C. 5170c, hereafter Stafford Act, or the Act.

[59 FR 24356, May 11, 1994]

§ 206.431 Definitions.

Activity means any mitigation measure, project, or action proposed to reduce risk of future damage, hardship, loss or suffering from disasters.

Applicant means the non-Federal entity consisting of a State or Indian Tribal government, applying to FEMA for a Federal award under the Hazard Mitigation Grant Program. Upon award, the applicant becomes the recipient and may also be a pass-through entity.

Enhanced State Mitigation Plan is the hazard mitigation plan approved under 44 CFR part 201 as a condition of receiving increased funding under the HMGP.

Grant application means the request to FEMA for HMGP funding, as outlined in § 206.436, by a State or Tribal government that will act as recipient.

Grant award means total of Federal and non-Federal contributions to complete the approved scope of work.

Indian Tribal government means any Federally recognized governing body of an Indian or Alaska Native Tribe, band, nation, pueblo, village, or community that the Secretary of Interior acknowledges to exist as an Indian Tribe under the Federally Recognized Indian Tribe List Act of 1994, 25 U.S.C. 5131. This does not include Alaska Native corporations, the ownership of which is vested in private individuals. Indian Tribal governments have the option to apply as an applicant or subapplicant.

Local Mitigation Plan is the hazard mitigation plan required of a local government acting as a subrecipient as a condition of receiving a project subaward under the HMGP as outlined in 44 CFR 201.6.

Pass-through entity means a recipient that provides a subaward to a subrecipient.

Recipient means the State or Indian Tribal government that receives a Federal award directly from FEMA. A recipient may also be a pass-through entity. The term recipient does not include subrecipients. The recipient is the entire legal entity even if only a particular component of the entity is designated in the grant award document. Generally, the State is the recipient. However, an Indian Tribal government may choose to be a recipient, or may act as a subrecipient under the State. An Indian Tribal government acting as recipient will assume the responsibilities of a "State", as described in this part, for the purposes of administering the grant.

Standard State Mitigation Plan is the hazard mitigation plan approved under 44 CFR part 201, as a condition of receiving Stafford Act assistance as outlined in § 201.4 of this chapter.

State Administrative Plan for the Hazard Mitigation Grant Program means the plan developed by the State to describe the procedures for administration of the HMGP.

Subapplicant means the State agency, local government, eligible private nonprofit organization, or Indian Tribal government submitting a subapplication to the applicant for financial assistance under HMGP. Upon award, the subapplicant becomes the subrecipient.

Subaward means an award provided by a pass-through entity to a subrecipient for the subrecipient to carry out part of a Federal award.

Subaward application means the request to the recipient for HMGP funding by the eligible subrecipient, as outlined in § 206.436.

Subrecipient means the government or other legal entity to which a subaward is awarded and which is accountable to the recipient for the use of the funds provided. Subrecipients can be a State agency, local government, private nonprofit organization, or Indian Tribal government as outlined in § 206.433. Indian Tribal governments acting as a subrecipient are accountable to the State recipient.

Tribal Mitigation Plan is the hazard mitigation plan required of an Indian Tribal government acting as a recipient or subrecipient as a condition of receiving a project award or subaward under the HMGP as outlined in 44 CFR 201.7.

[86 FR 50676, Sept. 10, 2021]

§ 206.432 Federal grant assistance.

(a) ***General.*** This section describes the extent of Federal funding available under the State's grant, as well as limitations and special procedures applicable to each.

(b) ***Amounts of assistance.*** The total Federal contribution of funds is based on the estimated aggregate grant amount to be made under the Stafford Act for the major disaster (less associated administrative costs), and must be as follows:

(1) ***Standard percentages.*** Not to exceed 15 percent for the first $2,000,000,000 or less of such amounts; not to exceed 10 percent of the portion of such amounts over $2,000,000,000 and not more than $10,000,000,000; and not to exceed 7.5 percent of the portion of such amounts over $10,000,000,000 and not more than $35,333,000,000.

(2) ***Twenty (20) percent.*** A State with an approved Enhanced State Mitigation Plan, in effect before the disaster declaration, which meets the requirements outlined in § 201.5 of this subchapter will be eligible for assistance under the HMGP not to exceed 20 percent of such amounts, for amounts not more than $35.333 billion.

(3) The estimates of Federal assistance under this paragraph (b) will be based on the Regional Administrator's estimate of all eligible costs, actual grants, and appropriate mission assignments.

(c) ***Cost sharing.*** All mitigation measures approved under the State's grant will be subject to the cost sharing provisions established in the FEMA-State Agreement. FEMA may contribute up to 75 percent of the cost of measures approved for funding under the Hazard Mitigation Grant Program for major disasters declared on or after June 10, 1993. The non-Federal share may exceed the Federal share. FEMA will not contribute to costs above the Federally approved estimate.

[55 FR 35537, Aug. 30, 1990, as amended at 59 FR 24356, May 11, 1994; 67 FR 8853, Feb. 26, 2002; 67 FR 61515, Oct. 1, 2002; 69 FR 55097, Sept. 13, 2004; 72 FR 61750, Oct. 31, 2007; 74 FR 47482, Sept. 16, 2009; 86 FR 50677, Sept. 10, 2021]

§ 206.433 State responsibilities.

(a) ***Recipient.*** The State will be the recipient to which funds are awarded and will be accountable for the use of those funds. There may be subrecipients within the State government.

(b) ***Priorities.*** The State will determine priorities for funding. This determination must be made in conformance with § 206.435.

(c) ***Hazard Mitigation Officer.*** The State must appoint a Hazard Mitigation Officer who serves as the responsible individual for all matters related to the Hazard Mitigation Grant Program.

(d) ***Administrative plan.*** The State must have an approved administrative plan for the Hazard Mitigation Grant Program in conformance with § 206.437.

[55 FR 35537, Aug. 30, 1990, as amended at 72 FR 61750, Oct. 31, 2007; 86 FR 50677, Sept. 10, 2021]

§ 206.434 Eligibility.

(a) ***Eligible entities.*** The following are eligible to apply for the Hazard Mitigation Program Grant:

(1) Applicants—States and Indian Tribal governments;

(2) Subapplicants—

(i) State agencies and local governments;

(ii) Private nonprofit organizations that own or operate a private nonprofit facility as defined in § 206.221(e). A qualified conservation organization as defined at § 80.3(h) of this chapter is the only private nonprofit organization eligible to apply for acquisition or relocation for open space projects;

(iii) Indian Tribal governments.

(b) *Plan requirement.*

(1) Local and Indian Tribal government applicants for project subawards must have an approved local or Tribal Mitigation Plan in accordance with 44 CFR part 201 before receipt of HMGP subaward funding for projects.

(2) Regional Administrators may grant an exception to this requirement in extraordinary circumstances, such as in a small and impoverished community when justification is provided. In these cases, a plan will be completed within 12 months of the award of the project subaward. If a plan is not provided within this timeframe, the project subaward will be terminated, and any costs incurred after notice of subaward's termination will not be reimbursed by FEMA.

(c) *Minimum project criteria.* To be eligible for the Hazard Mitigation Grant Program, a project must:

(1) Be in conformance with the State Mitigation Plan and Local or Tribal Mitigation Plan approved under 44 CFR part 201; or for Indian Tribal governments acting as recipients, be in conformance with the Tribal Mitigation Plan approved under 44 CFR 201.7;

(2) Have a beneficial impact upon the designated disaster area, whether or not located in the designated area;

(3) Be in conformance with 44 CFR part 9, Floodplain Management and Protection of Wetlands, and other applicable environmental and historic preservation laws, regulations, Executive Orders, and agency policy;

(4) Solve a problem independently or constitute a functional portion of a solution where there is assurance that the project as a whole will be completed. Projects that merely identify or analyze hazards or problems are not eligible;

(5) Be cost-effective and substantially reduce the risk of future damage, hardship, loss, or suffering resulting from a major disaster. The recipient must demonstrate this by documenting that the project;

(i) Addresses a problem that has been repetitive, or a problem that poses a significant risk to public health and safety if left unsolved,

(ii) Will not cost more than the anticipated value of the reduction in both direct damages and subsequent negative impacts to the area if future disasters were to occur,

(iii) Has been determined to be the most practical, effective, and environmentally sound alternative after consideration of a range of options,

(iv) Contributes, to the extent practicable, to a long-term solution to the problem it is intended to address,

(v) Considers long-term changes to the areas and entities it protects, and has manageable future maintenance and modification requirements.

(d) *Eligible activities* —

(1) *Planning.* Up to 7% of the State's HMGP award may be used to develop State, Tribal and/or local mitigation plans to meet the planning criteria outlined in 44 CFR part 201.

(2) *Types of projects.* Projects may be of any nature that will result in protection to public or private property. Activities for which implementation has already been initiated or completed are not eligible for funding. Eligible projects include, but are not limited to:

(i) Structural hazard control or protection projects;

(ii) Construction activities that will result in protection from hazards;

(iii) Retrofitting of facilities;

(iv) Property acquisition or relocation, as defined in paragraph (e) of this section;

(v) Development of State or local mitigation standards;

(vi) Development of comprehensive mitigation programs with implementation as an essential component;

(vii) Development or improvement of warning systems.

(e) *Property acquisitions and relocation requirements.* Property acquisitions and relocation projects for open space proposed for funding pursuant to a major disaster declared on or after December 3, 2007 must be implemented in accordance with part 80 of this chapter.

(f) *Duplication of programs.* Section 404 funds cannot be used as a substitute or replacement to fund projects or programs that are available under other Federal authorities, except under limited circumstances in which there are extraordinary threats to lives, public health or safety or improved property.

(g) *Packaging of programs.* Section 404 funds may be packaged or used in combination with other Federal, State, local, or private funding sources when appropriate to develop a comprehensive mitigation solution, though section 404 funds cannot be used as a match for other Federal funds.

[55 FR 35537, Aug. 30, 1990, as amended at 59 FR 24356, May 11, 1994; 67 FR 8853, Feb. 26, 2002; 67 FR 61515, Oct. 1, 2002; 69 FR 55097, Sept. 13, 2004; 72 FR 61750, Oct. 31, 2007; 74 FR 47483, Sept. 16, 2009; 81 FR 56534, Aug. 22, 2016; 86 FR 50677, Sept. 10, 2021]

§ 206.435 Project identification and selection criteria.

(a) *Identification.* It is the State's responsibility to identify and select eligible hazard mitigation projects. All funded projects must be consistent with the State Mitigation Plan. Hazard Mitigation projects will be identified and prioritized through the State, Indian tribal, and local planning process.

(b) *Selection.* The State will establish procedures and priorities for the selection of mitigation measures. At a minimum, the criteria must be consistent with the criteria stated in § 206.434(c) and include:

(1) Measures that best fit within an overall plan for development and/or hazard mitigation in the community, disaster area, or State;

(2) Measures that, if not taken, will have a severe detrimental impact on the applicant, such as potential loss of life, loss of essential services, damage to critical facilities, or economic hardship on the community;

(3) Measures that have the greatest potential impact on reducing future disaster losses;

(c) *Other considerations.* In addition to the selection criteria noted above, consideration should be given to measures that are designed to accomplish multiple objectives including damage reduction, environmental enhancement, and economic recovery, when appropriate.

[55 FR 35537, Aug. 30, 1990, as amended at 66 FR 8853, Feb. 26, 2002; 68 FR 63738, Nov. 10, 2003; 86 FR 50678, Sept. 10, 2021]

§ 206.436 Application procedures.

(a) *General.* This section describes the procedures to be used by the recipient in submitting an application for HMGP funding. Under the HMGP, the State or Indian Tribal government is the recipient and is responsible for processing subawards to applicants in accordance with 2 CFR parts 200 and 3002. Subrecipients are accountable to the recipient.

(b) *Governor's Authorized Representative.* The Governor's Authorized Representative serves as the grant administrator for all funds provided under the Hazard Mitigation Grant Program. The Governor's Authorized Representative's responsibilities as they pertain to procedures outlined in this section include providing technical advice and assistance to eligible subrecipients, and ensuring that all potential applicants are aware of assistance available and submission of those documents necessary for grant award.

(c) *Hazard mitigation application.* Upon identification of mitigation measures, the State (Governor's Authorized Representative) will submit its Hazard Mitigation Grant Program application to the FEMA Regional Administrator. The application will identify one or more mitigation measures for which funding is requested. The application must include a Standard Form (SF) 424, Application for Federal Assistance, SF 424D, Assurances for Construction Programs, if appropriate, and a narrative statement. The narrative statement will contain any pertinent project management information not included in the State's administrative plan for Hazard Mitigation. The narrative statement will also serve to identify the specific mitigation measures for which funding is requested. Information required for each mitigation measure must include the following:

(1) Name of the subrecipient, if any;

(2) State or local contact for the measure;

(3) Location of the project;

(4) Description of the measure;

(5) Cost estimate for the measure;

(6) Analysis of the measure's cost-effectiveness and substantial risk reduction, consistent with § 206.434(c);

(7) Work schedule;

(8) Justification for selection;

(9) Alternatives considered;

(10) Environmental information consistent with 44 CFR part 9, Floodplain Management and Protection of Wetlands, and other applicable environmental and historic preservation laws, regulations, Executive Orders, and agency policy.

(d) *Application submission time limit.* The State's application may be amended as the State identifies and selects local project applications to be funded. The State must submit all local HMGP applications and funding requests for the purpose of identifying new projects to the Regional Administrator within 12 months of the date of disaster declaration.

(e) *Extensions.* The State may request the Regional Administrator to extend the application time limit by 30 to 90 day increments, not to exceed a total of 180 days. The recipient must include a justification in its request.

(f) *FEMA approval.* The application and supplement(s) will be submitted to the FEMA Regional Administrator for approval. FEMA has final approval authority for funding of all projects.

(g) *Indian Tribal recipients.* Indian Tribal governments may submit a SF 424 directly to the Regional Administrator.

[67 FR 8853, Feb. 26, 2002, as amended at 79 FR 76086, Dec. 19, 2014; 81 FR 56534, Aug. 22, 2016; 86 FR 50678, Sept. 10, 2021]

§ 206.437 State administrative plan.

(a) *General.* The State must develop a plan for the administration of the Hazard Mitigation Grant Program.

(b) *Minimum criteria.* At a minimum, the State administrative plan must include the items listed below:

(1) Designation of the State agency will have responsibility for program administration;

(2) Identification of the State Hazard Mitigation Officer responsible for all matters related to the Hazard Mitigation Grant Program.

(3) Determination of staffing requirements and sources of staff necessary for administration of the program;

(4) Establishment of procedures to:

(i) Identify and notify potential applicants (subrecipients) of the availability of the program;

(ii) Ensure that potential applicants are provided information on the application process, program eligibility and key deadlines;

(iii) Determine applicant eligibility;

(iv) Conduct environmental and floodplain management reviews;

(v) Establish priorities for selection of mitigation projects;

(vi) Process requests for advances of funds and reimbursement;

(vii) Monitor and evaluate the progress and completion of the selected projects;

(viii) Review and approve cost overruns;

(ix) Process appeals;

(x) Provide technical assistance as required to subrecipient(s);

(xi) Comply with the administrative and audit requirements of 2 CFR parts 200 and 3002 and 44 CFR part 206.

(xii) Provide quarterly progress reports to the Regional Administrator on approved projects.

(xiii) Determine the percentage or amount of pass-through funds for management costs provided under 44 CFR part 207 that the recipient will make available to subrecipients, and the basis, criteria, or formula for determining the subrecipient percentage or amount.

(c) *Format.* The administrative plan is intended to be a brief but substantive plan documenting the State's process for the administration of the Hazard Mitigation Grant Program and management of the section 404 funds. This administrative plan should become a part of the State's overall emergency response or operations plan as a separate annex or chapter.

(d) *Approval.* The State must submit the administrative plan to the Regional Administrator for approval. Following each major disaster declaration, the State must prepare any updates, amendments, or plan revisions required to meet current policy guidance or changes in the administration of the Hazard Mitigation Grant Program. Funds will not be awarded until the State Administrative Plan is approved by the FEMA Regional Administrator.

[55 FR 35537, Aug. 30, 1990, as amended at 55 FR 52172, Dec. 20, 1990; 72 FR 57875, Oct. 11, 2007; 74 FR 15352, Apr. 3, 2009; 79 FR 76086, Dec. 19, 2014; 86 FR 50678, Sept. 10, 2021]

§ 206.438 Project management.

(a) *General.* The State serving as recipient has primary responsibility for project management and accountability of funds as indicated in 2 CFR parts 200 and 3002 and 44 CFR part 206. The State is responsible for ensuring that subrecipients meet all program and administrative requirements.

(b) *Cost overruns.* During the execution of work on an approved mitigation measure the Governor's Authorized Representative may find that actual project costs are exceeding the approved estimates. Cost overruns which can be met without additional Federal funds, or which can be met by offsetting cost underruns on other projects, need not be submitted to the Regional Administrator for approval, so long as the full scope of work on all affected projects can still be met. For cost overruns which exceed Federal obligated funds and which require additional Federal funds, the Governor's Authorized Representative will evaluate each cost overrun and submit a request with a recommendation to the Regional Administrator for a determination. The applicant's justification for additional costs and other pertinent material must accompany the request. The Regional Administrator will notify the Governor's Authorized Representative in writing of the determination and process a supplement, if necessary. All requests that are not justified must be denied by the Governor's Authorized Representative. In no case will the total amount obligated to the State exceed the funding limits set forth in § 206.432(b). Any such problems or circumstances affecting project costs must be identified through the quarterly progress reports required in paragraph (c) of this section.

(c) *Progress reports.* The recipient must submit a quarterly progress report to FEMA indicating the status and completion date for each measure funded. Any problems or circumstances affecting completion dates, scope of work, or project costs which are expected to result in noncompliance with the approved grant conditions must be described in the report.

(d) *Payment of claims.* The Governor's Authorized Representative will make a claim to the Regional Administrator for reimbursement of allowable costs for each approved measure. In submitting such claims the Governor's Authorized Representative must certify that reported costs were incurred in the performance of eligible work, that the approved work was completed and that the mitigation measure is in compliance with the provisions of the FEMA-State Agreement. The Regional Administrator will determine the eligible amount of reimbursement for each claim and approve payment. If a mitigation measure is not completed, and there is not adequate justification for noncompletion, no Federal funding will be provided for that measure.

(e) *Audit requirements.* Uniform audit requirements as set forth in 2 CFR parts 200 and 3002 and 44 CFR part 206 apply to all grant assistance provided under this subpart. FEMA may elect to conduct a Federal audit on the disaster assistance award or on any of the subawards.

[86 FR 50678, Sept. 10, 2021]

§ 206.439 Allowable costs.

(a) General requirements for determining allowable costs are established in 2 CFR part 200, Cost Principles. Exceptions to those requirements as allowed in 2 CFR 200.101 and 2 CFR 200.102 are explained in paragraph (b) of this section.

(b) Administrative and management costs for major disasters will be paid in accordance with 44 CFR part 207.

(c) *Pre-award costs.* FEMA may fund eligible pre-award planning or project costs at its discretion and as funds are available. Recipients and subrecipients may be reimbursed for eligible pre-award costs for activities directly related to the development of the project or planning proposal. These costs can only be incurred during the open application period of the grant program. Costs associated with implementation of the activity but incurred prior to grant award are not eligible. Therefore, activities where implementation is initiated or completed prior to award are not eligible and will not be reimbursed.

[72 FR 57875, Oct. 11, 2007, as amended at 72 FR 61750, Oct. 31, 2007; 79 FR 76086, Dec. 19, 2014; 86 FR 50679, Sept. 10, 2021]

§ 206.440 Appeals.

An eligible applicant, subrecipient, or recipient may appeal any determination previously made related to an application for or the provision of Federal assistance according to the procedures in this section.

(a) *Format and content.* The applicant or recipient will make the appeal in writing through the recipient to the Regional Administrator. The recipient-will review and evaluate all subrecipient appeals before submission to the Regional Administrator. The recipient may make recipient-related appeals to the Regional Administrator. The appeal must contain documented justification supporting the appellant's position, specifying the monetary figure in dispute and the provisions in Federal law, regulation, or policy with which the appellant believes the initial action was inconsistent.

(b) *Levels of appeal.*

(1) The Regional Administrator will consider first appeals for hazard mitigation grant program-related decisions under subparts M and N of this part.

(2) The Assistant Administrator for the Mitigation Directorate will consider appeals of the Regional Administrator's decision on any first appeal under paragraph (b)(1) of this section.

(c) *Time limits.*

(1) Appellants must make appeals within 60 days after receipt of a notice of the action that is being appealed.

(2) The recipient will review and forward appeals from an applicant or subrecipient, with a written recommendation, to the Regional Administrator within 60 days of receipt.

(3) Within 90 days following receipt of an appeal, the Regional Administrator (for first appeals) or Assistant Administrator for the Mitigation Directorate (for second appeals) will notify the recipient in writing of the disposition of the appeal or of the need for additional information. A request by the Regional Administrator or Assistant Administrator for the Mitigation Directorate for additional information will include a date by which the information must be provided. Within 90 days following the receipt of the requested additional information or following expiration of the period for providing the information, the Regional Administrator or Assistant Administrator for the Mitigation Directorate will notify the recipient in writing of the disposition of the appeal. If the decision is to grant the appeal, the Regional Administrator will take appropriate implementing action.

(d) *Technical advice.* In appeals involving highly technical issues, the Regional Administrator or Assistant Administrator for the Mitigation Directorate may, at his or her discretion, submit the appeal to an independent scientific or technical person or group having expertise in the subject matter of the appeal for advice or recommendation. The period for this technical review may be in addition to other allotted time periods. Within 90 days of receipt of the report, the Regional Administrator or Assistant Administrator for the Mitigation Directorate will notify the recipient in writing of the disposition of the appeal.

(e) *Transition.*

(1) This rule is effective for all appeals pending on and appeals from decisions issued on or after May 8, 1998, except as provided in paragraph (e)(2) of this section.

(2) Appeals pending from a decision of an Assistant Administrator for the Mitigation Directorate before May 8, 1998 may be appealed to the Administrator in accordance with 44 CFR 206.440 as it existed before May 8, 1998.

(3) The decision of the FEMA official at the next higher appeal level will be the final administrative decision of FEMA.

[63 FR 17111, Apr. 8, 1998, as amended at 86 FR 50679, Sept. 10, 2021]

Hazard Mitigation Assistance Program and Policy Guide

Hazard Mitigation Grant Program, Hazard Mitigation Grant Program Post Fire, Building Resilient Infrastructure and Communities, and Flood Mitigation Assistance

March 23, 2023

Federal Enterprise Architecture (FEA) Number: FP-206-21-0001

FEMA

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Titles of Opportunities

- Hazard Mitigation Grant Program (HMGP)
- Hazard Mitigation Grant Program Post Fire (HMGP Post Fire)
- Building Resilient Infrastructure and Communities (BRIC)
- Flood Mitigation Assistance (FMA)

Assistance Listing Numbers

- 97.039 - HMGP
- 97.039 - HMGP Post Fire
- 97.047 - BRIC
- 97.029 - FMA

Federal Agency Name

- Department of Homeland Security
- Federal Emergency Management Agency

Letter from the Assistant Administrator (Acting) for Mitigation

I am pleased to share the 2023 Hazard Mitigation Assistance Program and Policy Guide (HMA Guide) as FEMA's updated comprehensive policy handbook to govern mitigation grant programs. This document replaces the 2015 HMA Guidance and HMA Guidance Addendum.

Since the last update and publication, many developments have impacted our mitigation grant programs. They include the passage of the Disaster Recovery Reform Act of 2018; the rollout of a new hazard mitigation grant program—Building Resilient Infrastructure and Communities (BRIC); significantly increased funding and accessibility to mitigation programs via the Infrastructure Investments and Jobs Act of 2021; and prioritization of new resilience concepts to accelerate and advance mitigation investment, such as those outlined in the National Mitigation Investment Strategy and FEMA's Building Codes Strategy.

In addition, FEMA recently launched the new Safeguarding Tomorrow Revolving Loan Fund program, which provides capitalization grants to states, eligible tribal nations, territories and the District of Columbia to establish a revolving loan fund to offer low-cost loans to help local governments fund additional mitigation measures, including using it as the non-federal cost share for other HMA programs. This program is not included in this update as it is under development, but more information can be found on the Safeguarding Tomorrow RLF program webpage.

The HMA Guide update offers an important opportunity for FEMA to integrate these developments while also supporting the three bold, ambitious goals outlined in the 2022-2026 FEMA Strategic Plan: instill equity as a foundation of emergency management; lead whole of community in climate resilience and promote and sustain a ready FEMA and prepared nation.

FEMA's Hazard Mitigation Assistance grant programs provide funding for actions that address risks to and reduce disaster suffering from events like wildfires, drought, extreme heat, hurricanes, earthquakes and flooding. The updated HMA Guide provides helpful information for state, local, tribal and territorial governments seeking to successfully navigate the application and grant lifecycle processes. And with the unprecedented funding that has been made available for mitigation over the past few years, it has never been more important to reduce the barriers to accessing these grant dollars and get them into the right hands for the most impactful mitigation projects.

The HMA Guide update is the first step in a multi-phase process to better engage stakeholders, shift to a more agile update process, and increase the accessibility of information for HMA policy and programs.

With regards,

ERIC J LETVIN

Digitally signed by ERIC J LETVIN
Date: 2023.03.22 21:00:34 -04'00'

Eric Letvin
Assistant Administrator (Acting), Mitigation Directorate

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Part 1. Introduction

This Introduction addresses the scope and applicability of the 2023 *Hazard Mitigation Assistance Program and Policy Guide* (HMA Guide or the Guide); provides an overview of the programmatic changes made since the Federal Emergency Management Agency (FEMA) issued the Feb. 27, 2015, *Hazard Mitigation Assistance Guidance* and the *Hazard Mitigation Assistance Guidance Addendum* (2015 HMA Guidance and Addendum); and addresses guiding principles and priorities for Hazard Mitigation Assistance (HMA) programs: Hazard Mitigation Grant Program (HMGP), Hazard Mitigation Grant Program Post Fire (HMGP Post Fire), Building Resilient Infrastructure and Communities (BRIC) and Flood Mitigation Assistance (FMA).

Hazard mitigation is defined as any sustained action taken to reduce or eliminate long-term risk to people and property from natural hazard events and their effects. The long-term impact of hazard mitigation actions can be distinguished from those actions that are more closely associated with immediate preparedness, response and recovery activities, as hazard mitigation is the only emergency management phase specifically dedicated to breaking the cycle of damage, reconstruction and repeated damage.

HMA programs are mandated to provide assistance to state, local, tribal and territorial governments so they can plan for and implement activities that reduce or mitigate future disaster losses in their communities long term.[1] State, local, tribal and territorial governments are encouraged to take advantage of HMA programs both before and after disasters.

HMA programs are not the sole source of federal mitigation assistance. Mitigation is supported through other means and programs at FEMA, which are highlighted below, as well as at other government agencies. The Department of Housing and Urban Development, the Small Business Administration, the Department of Agriculture and nonprofit and private organizations work alongside FEMA to support mitigation.

FEMA is always looking for ways to enhance the suite of mitigation programs to better serve stakeholders. While the HMA Guide covers HMGP, HMGP Post Fire, BRIC and FMA, FEMA encourages stakeholders to explore other programs such as the Safeguarding Tomorrow through Ongoing Risk Mitigation Revolving Loan Fund (Safeguarding Tomorrow RLF) program to find additional sources of assistance to meet their mitigation needs. The Safeguarding Tomorrow RLF program is intended to provide low-cost loans to help communities fund additional mitigation measures and may be used to meet the non-federal cost share for other HMA programs.[2]

[1] Robert T. Stafford Disaster Relief and Emergency Assistance Act, Public Law 100-707 (Nov. 23, 1988); amending the Disaster Relief Act of 1974, Public Law 93-288 (May 22, 1974).

[2] This program is not included in the HMA Guide, as it is still under development, but more information can be found on the Safeguarding Tomorrow RLF program webpage.

A. Complementary FEMA Mitigation Programs

FEMA aims to prepare communities, reduce suffering, and speed recovery through its portfolio of Resilience programs, which includes Hazard Mitigation Assistance, Mitigation Planning, Risk Mapping, Assessment and Planning (Risk MAP), and other Resilience and Preparedness grants. FEMA's recovery programs, Public Assistance (PA) and Individual Assistance (IA), also provide mitigation opportunities to help communities build back better in the wake of disaster. Each of these programs is key to building more resilient communities.

The National Mitigation Planning program is responsible for implementing requirements for hazard mitigation planning and the HMA Division is responsible for all aspects of the HMA programs; the Mitigation Planning program and HMA have a close partnership. The Mitigation Planning program and HMA closely coordinate on mitigation planning subapplications before subapplicants receive HMA funding.

Successful mitigation activities, including those assisted by HMA programs, are based on well-crafted mitigation plans. Mitigation plans allow state, local, tribal and territorial governments to organize their long-term strategies for protecting people and property from future natural hazard events after assessing all disaster risks and vulnerabilities common to their planning areas. The mitigation planning process is prescribed in regulations and should result in mitigation actions based on a fair, logical and fact-based thought process. The mitigation plan must be adopted by the jurisdiction and approved by FEMA unless otherwise delegated. Adoption and approval of state, local, tribal and territorial plans are eligibility requirements for HMGP, HMGP Post Fire, BRIC and FMA.[3] State and tribal mitigation plans are also eligibility requirements for PA Categories C-G, Fire Management Assistance Grants (FMAGs), and the Rehabilitation of High Hazard Potential Dam (HHPD) grants. These plans need to be updated every five years to account for changing risk profiles and priorities.[4]

Through Risk MAP, FEMA provides communities with education, risk communication and outreach to better protect residents from flood risks. The Risk MAP project lifecycle emphasizes community engagement and partnerships to ensure a whole community approach that reduces flood risk and builds more resilient communities. Risk MAP risk assessment information strengthens a local community's ability to make more informed decisions. Risk MAP allows communities to better determine and prioritize activities funded under HMA programs.

Through PA and IA, FEMA supports mitigation activities done in conjunction with eligible repair or restoration of homes and facilities during the recovery process. PA Mitigation is often referred to as "406 Mitigation," as the basis for this program is in Section 406 of the Robert T. Stafford Disaster Relief and Emergency Assistance Act (Stafford Act).[5] Under IA, the Individuals and Households

[3] For mitigation planning, the term "state" is inclusive of the District of Columbia, American Samoa, Commonwealth of Northern Mariana Islands, Guam, Puerto Rico and the U.S. Virgin Islands according to 44 Code of Federal Regulations (CFR) § 201.2

[4] 44 CFR § 201.3

[5] Public Law 100-707 (Nov. 23, 1988); amending the Disaster Relief Act of 1974, Public Law 93-288 (May 22, 1974)

Program provides funds for hazard mitigation assistance to help eligible homeowners repair or rebuild stronger, more durable homes.

The HHPD grant program provides technical, planning, design and construction assistance in the form of grants to non-federal sponsors for the rehabilitation of eligible high-hazard potential dams. The HHPD program is authorized by 33 United States Code (U.S.C.) § 467f-2.

B. HMA Guide Scope

FEMA issues policies to articulate the agency's intent to apply statutory and regulatory authority to achieve desired outcomes. The purpose of the HMA Guide is to outline the policy and procedural requirements of HMA's programs over the lifecycle of an activity.

C. HMA Guide Applicability and Effective Date

The HMA Guide is used to achieve consistent implementation of the HMA programs across the nation and should be a tool to aid decision-making. The HMA Guide is not law; however, it must be followed when it is citing applicable statutory and regulatory requirements. When describing policy, the HMA Guide should be followed to ensure consistent and fair administration of the HMA programs.

The effective date of the HMA Guide is March 23, 2023. The 2023 HMA Guide applies to HMGP, HMGP Post Fire, BRIC and FMA. Unless stated otherwise in the HMA Guide or an appropriate authoritative source, the HMA Guide applies and supersedes the 2015 HMA Guidance and Addendum and all policies and guidance issued between Feb. 2015 and the date of publication of the HMA Guide.

Major disaster declarations made and Notices of Funding Opportunity (NOFOs) published prior to the effective date continue to be governed by the guide (including any policy directives) in effect at the time of the major disaster declaration or NOFO. This includes applications/subapplications submitted and awards/subawards made under those prior disaster declarations and NOFOs.

For HMGP, the HMA Guide applies to Presidential Disaster Declarations declared on or after the date of publication unless indicated otherwise.

The Disaster Recovery Reform Act of 2018[6] made legislative changes to the Stafford Act and created the HMGP Post Fire program.[7] For HMGP Post Fire, the HMA Guide applies to FMAG declarations issued or published on or after March 23, 2023.[8]

For FMA, the HMA Guide applies to NOFOs published on or after the effective date. This includes applications/subapplications submitted and awards/subawards made under the NOFOs.

On Aug. 4, 2020, FEMA established the BRIC program, which implements Section 1234 of the Disaster Recovery Reform Act, and is authorized under Section 203 of the Stafford Act.[9] For BRIC, the HMA Guide applies to applications/subapplications submitted and awards/subawards made under BRIC NOFOs issued on or after March 23, 2023. BRIC applications and subapplications submitted before the effective date of the HMA Guide are governed by the NOFO and BRIC guidance materials applicable for the year in which the applications are made, rather than prior versions of the HMA Guidance and the Addendum that were published before the implementation of BRIC.

FEMA may use the Pre-Disaster Mitigation (PDM) program when administering grant funding as directed by Congress. For PDM, the HMA Guide generally applies to NOFOs published on or after March 23, 2023. Please refer to the relevant PDM NOFO for additional guidance.

If any requirements in the HMA Guide conflict with the applicable NOFO, the requirements in the NOFO take precedence. The HMA Guide is subject to legal and regulatory changes enacted after publication. FEMA periodically assesses its program and policy guidance and may issue new policy or guidance. The information provided in the HMA Guide is applicable unless otherwise stated in updated policy or other guidance materials.

Table 1 summarizes the applicability of the various versions of the HMA Guidance/Guide to the HMA programs:

Table 1: HMA Guidance/Guide Applicability

Program	The 2023 HMA Guide Applies to:	2015 HMA Guidance and Addendum or Prior Versions Apply to:
Hazard Mitigation Grant Program (HMGP)	Major disaster declarations made on or after March 23, 2023	Major disaster declarations made before March 23, 2023

[6] Division D of Public Law 115-254 (Oct. 5, 2018)

[7] Section 1204 of the Disaster Recovery Reform Act amended Section 404 of the Stafford Act to allow FEMA to provide HMGP assistance for hazard mitigation measures that substantially reduce the risk of future damage, hardship, loss or suffering in any area affected by a major disaster, or any area affected by a fire for which assistance was provided under the FMAG program (Section 420 of the Stafford Act). The HMGP Post Fire framework was outlined in FEMA Policy #207-088-2: *Hazard Mitigation Grant Program—Post Fire* (April 29, 2019) and is superseded by the HMA Guide.

[8] States, federally recognized tribes and territories affected by fires resulting in an FMAG declaration on or after Oct. 5, 2018, but before March 23, 2023, are governed by the HMGP Post Fire framework outlined in FEMA Policy #207-088-2.

[9] Disaster Recovery Reform Act of 2018 (Public Law 115-254); 42 U.S.C. § 5133

Program	The 2023 HMA Guide Applies to:	2015 HMA Guidance and Addendum or Prior Versions Apply to:
HMGP Post Fire	FMAG declarations made on or after March 23, 2023	FMAG declarations made on or after Oct. 5, 2018, and before March 23, 2023[10]
Building Resilient Infrastructure and Communities (BRIC)	NOFO published on or after March 23, 2023	Not applicable (follow the information posted on the "Building Resilient Infrastructure and Communities" webpage)
Flood Mitigation Assistance (FMA)	NOFO published on or after March 23, 2023	NOFO published before March 23, 2023

D. Applicability of Other Publications

Unless otherwise noted, when the HMA Guide references requirements detailed in other publications (including FEMA, other government and professional publications), those requirements are applicable as follows:

- For HMGP and HMGP Post Fire, applicants must follow the version of the publication in effect on the date of the disaster declaration.
- For BRIC and FMA, applicants must follow the requirements in the applicable NOFO. Unless otherwise noted in the NOFO, applicants must follow the version of the publication in effect on the start date of the application period.

E. Strategic Considerations for Mitigation

The HMA Guide takes into account the following strategic considerations: The National Mitigation Investment Strategy, community lifelines, climate change, equity, and building codes and standards. These topics are explored in further detail below.

E.1. National Mitigation Investment Strategy

In Aug. 2019, FEMA published the *National Mitigation Investment Strategy*. The Investment Strategy is a national strategy for advancing mitigation investment to reduce risks posed by natural hazards (e.g., sea level rise, droughts, floods, hurricanes, tornadoes, wildfires and earthquakes) and to increase the nation's resilience to natural hazards. It was developed by the Mitigation Framework

[10] States, federally recognized tribes and territories affected by fires resulting in a FMAG declaration on or after Oct. 5, 2018, but before March 23, 2023, are governed by the HMGP Post Fire framework outlined in FEMA Policy #207-088-2.

Leadership Group, which is chaired by FEMA.[11] The Mitigation Framework Leadership Group comprises federal, state, local, tribal and territorial public-sector representatives. Its responsibilities include organizing mitigation efforts across the federal government, integrating federal efforts to deliver the mitigation core capabilities described in the *National Mitigation Framework*, and assessing the effectiveness of these capabilities across the United States.[12] Through the Mitigation Framework Leadership Group and its HMA programs, FEMA continually looks for opportunities to coordinate among federal agencies and programs to better align mitigation efforts to advance the National Mitigation Investment Strategy.

The Investment Strategy responds to a recommendation made in 2015 by the Government Accountability Office after reviewing the federal response to Hurricane Sandy. Among the Government Accountability Office's key findings were that mitigation investments had not been coordinated within and outside of the government, thereby reducing the effectiveness of investments. Thus, the Investment Strategy calls for non-federal partners and the federal government to work together to better identify, prioritize and implement mitigation investments.

The Investment Strategy's purpose is to increase the nation's resilience to natural hazards through more effective, efficient mitigation investment. The Investment Strategy's objective is to identify and measure the effectiveness of mitigation investments and inform decisions on when and where to make investments. The Investment Strategy's recommendations focus specifically on how the federal government and non-federal partners can identify, support, influence and align whole community mitigation investments.

The Investment Strategy's goals are to:

1. **Show how mitigation investments reduce risk**: Goal 1 encourages a common understanding of how mitigation investments reduce risks to people, homes, neighborhoods, cultural and historic resources, ecosystems, and lifelines such as communications, energy, transportation and water. Recommendations to achieve this goal include making mitigation investments relevant, increasing investments by building the capacity of communities to address their risks, and using common measures to aid decision-making for mitigation investment.
2. **Coordinate mitigation investments to reduce risk**: Goal 2 encourages information sharing, strategy coordination and making funding sources easier to access and use. Improved access to risk and risk reduction information will help the federal government and non-federal partners justify mitigation investments and choose the most cost-effective and reasonable actions.

[11] The Mitigation Framework Leadership Group is a national coordinating group authorized by the Post-Katrina Emergency Management Reform Act of 2006, Title VI of Public Law 109-295 (Oct. 4, 2006).

[12] The National Mitigation Framework describes the benefits of being prepared by understanding risks and what actions can help address those risks. The second edition of the National Mitigation Framework was published by FEMA in 2016 and focuses on a culture of preparedness that is centered on risk and resilience. The document provides context for how the whole community works together and how mitigation efforts relate to all other parts of national preparedness. Focusing on the mitigation aspect of preparedness, the Framework addresses how the nation will develop, deploy and coordinate mitigation core capabilities to reduce loss of life and property by lessening the impact of disasters.

Improved coordination will help the whole community more accurately forecast where mitigation can be effective and when to pursue mitigation investments.

3. **Make mitigation investment standard practice**: Goal 3 calls for the whole community to consider mitigation in all investment decisions, especially for buildings and infrastructure. This includes adopting and enforcing up-to-date building codes, safeguarding lifelines and critical infrastructure, and using and expanding financial products and approaches that transfer and reduce risk. Financial products and approaches could include funding, incentives and opportunities to transfer financial risk.

The HMA Guide considers and addresses some of the Investment Strategy's goals. Additionally, while the Investment Strategy does not make structural changes to existing federal programs, such as HMA programs, the programs play an important part in reaching the Investment Strategy's goals. HMA programs support mitigation activities that reduce or eliminate potential losses to state, local, tribal and territorial governments, fostering resilience against the effects of natural disasters.

The Investment Strategy's principles, which are also relevant to the HMA programs, are:

- **The Whole Community**: All goals and recommendations require collaboration and commitment by the federal government, non-federal partners and individuals. The Whole Community includes:
  - Individuals and families, including those with disabilities.
  - Businesses.
  - Faith-based and community organizations.
  - Nonprofit groups.
  - Schools and academia.
  - Media outlets.
  - All levels of government including federal, state, local, tribal and territorial partners.
- **Regional and community planning**: The whole community should consider regional and community planning for mitigation activities. This includes public and private planning efforts for land use, the environment, infrastructure, transportation, site planning and urban design. Planning is foundational to identifying and developing sound mitigation activities that can be funded by HMA programs.
- **Nature-based solutions and natural assets**: The whole community should consider nature-based solutions for cost-effectively managing the impacts of natural hazards. These solutions may provide additional environmental, social and economic benefits. The whole community

should also consider protecting natural assets that help with mitigation (e.g., wetlands that reduce the impact of waves on coastal land).

- **Linking risk reduction and financial risk transfer**: The whole community should better link risk reduction and financial risk transfer mechanisms for natural hazard–related risks. For example, flood and other forms of hazard insurance accelerate recovery time frames to reduce loss by transferring financial risks from disasters. Additionally, insurance providers can increase incentives for policy holders to physically reduce a policy holder's risks and reduce overall damage, suffering and costs from a disaster.

- **Changing conditions**: Population growth, development and changing weather conditions will influence mitigation needs and priorities.

- **Vulnerable populations**: The whole community should ensure vulnerable populations are represented during implementation of Investment Strategy recommendations.

E.2. Community Lifelines

An additional priority that has emerged for HMA programs since the release of the Investment Strategy is the importance of community lifelines.[13] As part of the *National Response Framework*, FEMA developed the community lifeline framework (lifelines).[14] Lifelines enable the continuous operation of critical business and government functions and are essential to human health and safety or economic security. Lifelines are the integrated network of assets, services and capabilities that are used day-to-day to support the recurring needs of the community; mitigating lifelines should reduce cascading impacts across government and business functions and lessen system-wide damage.

Lifelines have served as a driving force behind the agency's strategic goal of promoting and sustaining a ready FEMA and prepared nation. At the same time, the concept is intended to increase agencies' response effectiveness and to promote the unification of response efforts across communities with the goal to stabilize or re-establish the communities' most fundamental services during and after a disaster.

[13] Community lifelines were tested and validated by federal, state, local, tribal and territorial partners in the aftermath of hurricanes Michael (Oct. 2018), Florence (Sep. 2018) and Dorian (Aug. 2019), Super Typhoon Yutu (Oct. 2018), the Alaska earthquake (Dec. 2018) and the coronavirus disease 2019 (COVID-19) pandemic (2020). They were formalized in the *National Response Framework,* Fourth Edition (Oct. 2019).

[14] The National Preparedness System outlines an organized process for the whole community to move forward with its preparedness activities and achieve the National Preparedness Goal. The *National Response Framework* sets the strategy and doctrine for how the whole community builds, sustains and delivers the response core capabilities identified in the National Preparedness Goal in an integrated manner with the other mission areas. The fourth edition of the *National Response Framework* emphasizes enhancing the unity of effort between the government and the private sector through better coordination and collaboration.

Lifelines are the most fundamental services needed for society to function. These services enable the continuous operation of government and business functions that are essential to human health and economic security. Lifelines include safety, security, food, shelter, and water, health and medical services, energy, communications, transportation and hazardous materials. The stabilization of community lifelines allows other aspects of society to function. While lifelines were developed to support response planning and operations, the concept can be applied across the entire preparedness cycle, including mitigation planning and mitigation activities.

The Investment Strategy encourages the federal government, non-federal partners and individuals to identify and prioritize activities that mitigate risk to lifelines to reduce the likelihood of disruption to critical services essential to human health, public safety and economic security. Mitigating risks to lifelines before, during and after disasters may result in less devastation, and response and recovery efforts may be faster and more effective.

Through its HMA programs, FEMA promotes mitigation to reduce risks to lifelines before disasters and quickly restore lifelines after disasters to prevent cascading impacts. HMA programs also encourage applicants and subapplicants to include partners responsible for maintaining and improving lifelines into their mitigation planning. Additionally, applicants and subapplicants are encouraged to prioritize activities that will improve the resilience of critical services to disadvantaged populations in future hazard events and that can be implemented using a wide range of public and private resources in accordance with the Investment Strategy.

E.3. Climate Change

Climate change increases the frequency, duration and intensity of storms, floods, fires and extreme temperatures that threaten the well-being of people across our nation. These variations can increase risks and magnify challenges for state and local governments. Communities are feeling the impacts of a changing climate now, and these multi-hazard trends will continue to increase in severity over the next century.[15] Emergency managers face the task of adapting to both immediate challenges and the long-term impacts of emerging climate risks.

In light of this reality, President Biden issued Executive Order (EO) 13990 on *Protecting Public Health and the Environment and Restoring Science to Tackle the Climate Crisis* (Jan. 20, 2021); EO 14008 on *Tackling the Climate Crisis at Home and Abroad* (Jan. 27, 2021); and EO 14030 on *Climate-Related Financial Risk* (May 20, 2021), which place climate change at the heart of federal priorities. FEMA recognizes challenges posed by climate change, including more intense storms, frequent heavy precipitation, heat waves, drought, prolonged wildfires, extreme flooding and changes in sea levels. Climate change is driving both disaster suffering and costs up and will continue to have

[15] U.S. Global Change Research Program, Fourth National Climate Assessment, Volume II: Impacts, Risks, and Adaptation in the United States, 2018; Intergovernmental Panel on Climate Change, The Physical Science Basis. Contribution of Working Group 1 to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change, 2021

increasing impacts on hazard mitigation, preparedness, response and recovery operations as well as the resilience of critical infrastructure and various emergency assets.

Climate adaptation measures can serve as hazard mitigation measures since both efforts have the same goals: long-term risk reduction for people, increased safety for communities and enhanced community resilience. Successful climate adaptation and hazard mitigation measures can vary depending on the scope of the action but often include changes in processes, behaviors, and infrastructure. The key difference between hazard mitigation and climate adaptation is that hazard mitigation encompasses all natural hazards, including short-term, episodic events that may or may not be connected to climate change. Climate adaptation efforts are focused on mitigating risk and impacts from current or expected climate conditions, so adapting to the expected impacts of climate change is a form of hazard mitigation. A hazard mitigation activity that addresses climate change in its design and approach can help reduce a community's risk from current and future climate events.

FEMA has issued several policies that facilitate the hazard mitigation of adverse effects from climate change on the built environment, structures and infrastructure. Communities are taking steps to address climate change through the engagement of individuals, households, local leaders, representatives of local organizations, private sector employers, and through existing community networks. Communities are also working to protect themselves and the environment by adopting and updating building codes, encouraging the conservation of natural and beneficial functions of the floodplains, investing in more resilient infrastructure, and engaging in mitigation planning. FEMA plays an important role in supporting community-based resilience efforts, establishing policies, and providing guidance to promote mitigation options that protect critical infrastructure, lifelines and public resources.

Through EO 14030, President Biden reinstated EO 13690 on *Establishing a Federal Flood Risk Management Standard and a Process for Further Soliciting and Considering Stakeholder Input* (Jan. 30, 2015). This executive order re-established the Federal Flood Risk Management Standard to address current and future flood risk and ensure that projects funded with taxpayer dollars last as long as intended. FEMA has begun partial implementation of the Federal Flood Risk Management Standards with the issuance of new policies to increase elevation standards for HMA projects. Refer to Part 4.I and Part 12 for more information about these requirements.[16]

FEMA also encourages communities to engage in environmentally friendly construction practices when implementing hazard mitigation projects, including the use of low embodied carbon concrete, environmentally preferable asphalt and other low-carbon materials.

[16] EO 13690 was issued under President Obama's administration and was revoked on Aug. 15, 2017, by President Trump through EO 13807 on *Establishing Discipline and Accountability in the Environmental Review and Permitting Process for Infrastructure Projects* (Aug. 15, 2017).

E.4. Equity

Changing climate conditions pose a unique threat to the nation's most at-risk populations by exacerbating the impacts of disasters on underserved and socially vulnerable communities, which already experience the greatest losses from natural hazards. The Investment Strategy recognizes the need to represent vulnerable populations, and the continued emphasis on equitable outcomes across the HMA programs has also been strengthened by other federal actions. On January 20, 2021, President Biden signed EO 13985 on *Advancing Racial Equity and Support for Underserved Communities Through the Federal Government*, which requires the federal government to "pursue a comprehensive approach to advancing equity for all, including people of color and others who have been historically underserved, marginalized, and adversely affected by persistent poverty and inequality."

EO 13985 defines equity as "the consistent and systematic fair, just, and impartial treatment of all individuals, including individuals who belong to underserved communities that have been denied such treatment, such as Black, Latino, and Indigenous and Native American persons, Asian Americans and Pacific Islanders and other persons of color; members of religious minorities; lesbian, gay, bisexual, transgender, queer and other (LGBTQ+) persons; persons with disabilities; persons who live in rural areas; and persons otherwise adversely affected by persistent poverty or inequality."

Data has shown that the most underserved and marginalized populations in our communities tend to live in at-risk hazard-prone areas or in homes with substandard construction.[17] The data also indicates that underserved and marginalized communities are less likely to recover after a disaster. Thus, FEMA has long worked with applicants and subapplicants to ensure that the concerns and needs of all members of the community are being considered, especially those in the communities that are most underserved and marginalized. FEMA works to ensure that all communities have fair and equal access to FEMA programs, including HMA programs, to mitigate future impacts of disasters and to reduce suffering.

HMA developed an Equity Action Plan in response to EO 13985. The *HMA Equity Action Plan* includes a series of actions focused on programmatic advances in the areas of data collection and analysis, program design, and outreach and engagement that will comprehensively assess HMA programs and help to increase state, local, tribal, and territorial capability and capacity. These efforts will provide program enhancements to increase the access to and the navigation of HMA programs. These enhancements include initiatives such as Direct Technical Assistance and location-based mitigation solutions designed to target the underserved communities that have the greatest natural hazard mitigation and resilient recovery needs.

HMA also aims to promote equity in the delivery of its programs in line with the Administration's Justice40 Initiative, which is outlined in EO 14008. In 2021, two FEMA HMA grant programs were selected as pilot programs under the Justice40 Initiative: BRIC and FMA. Under this pilot, BRIC and

[17] Emrich, Christopher T., Tate, Eric, Larson, Sarah E., and Zhou, Yao, "Measuring social equity in flood recovery funding," Environmental Hazards, 19:3, 228-250.

FMA will prioritize assistance that benefits disadvantaged communities as referenced in EO 14008. More information can be found in the respective programs' NOFOs.

E.5. Building Codes and Standards

Stronger, more resilient building codes strengthen community lifelines, reduce community risk and reduce overall disaster recovery costs.[18] Adopting and enforcing hazard-resistant building codes is one of the most cost-effective ways to safeguard communities against natural disasters. FEMA is leading efforts to advance the recognition of current building codes as a foundational element of resilience and will continue this effort through its HMA programs.

FEMA's *Building Codes Save: A Nationwide Study* found that universally adopting and enforcing up-to-date building codes could avoid more than $600 billion in losses by 2060 for known flood, hurricane and seismic risks. This finding, as well as the congressional passage of the Disaster Recovery Reform Act, laid the foundation for the development of the *FEMA Building Codes Strategy*. The strategy will help to coordinate and prioritize FEMA's activities to advance the adoption and enforcement of disaster-resistant building codes and standards for FEMA programs and communities nationwide and informs FEMA's requirements for achieving the Strategy's goals.

Its goals are to:

1. Integrate building codes and standards across FEMA.
2. Strengthen nationwide capability for superior building performance.
3. Drive public action on building codes.

Other federal efforts also acknowledge the importance of hazard-resistant building codes and advocate for their adoption and enforcement. FEMA's goals around building codes are reflected in the National Mitigation Investment Strategy, which makes several recommendations concerning the adoption, use, and enforcement of building codes, including using the latest published edition of building codes to ensure adequate structural integrity, mechanical integrity, fire prevention and energy conservation.

The White House launched the National Initiative to Advance Building Codes, building upon the recent work of FEMA. In launching the National Initiative to Advance Building Codes, the White House called on the Mitigation Framework Leadership Group to conduct a whole-of-government effort to ensure alignment across all federally-funded or -supported building construction to use the most recent editions of building codes, noting that "[c]ommunities that have adopted modern building codes are already saving an estimated $1.6 billion a year in avoided damage from major hazards,

[18] "Building codes" refers to the set of published editions of codes, specifications and standards, including relevant hazard-resistant provisions, which were developed by voluntary consensus standards bodies to protect public health and safety.

with projected cumulative savings of $132 billion through 2040, a figure that will become much higher if more communities adopt modern codes."[19]

There is still a long way to go in the collective effort to build a climate-resilient nation. Code adoption and enforcement still lag in areas of the country where disaster risks are the most severe; roughly one-third of communities facing damaging wind, hurricane, tornado, seismic or flood hazards have adopted hazard-resistant codes.[20] With the average annual number of billion-dollar disasters continuing to increase, adopting building codes is one of the most effective actions that communities can take to build resilience for the long term. Model building codes improve with each edition based on lessons learned, building science advancements, engineering practices and technological advances. Staying current, by adopting and enforcing the latest published building codes can save lives and protect property for generations to come. HMA programs provide critical assistance to state, local, tribal and territorial governments to adopt and improve enforcement of the most recent building codes. For more information regarding building code assistance available under HMA programs, refer to Part 11.

F. Changes from the 2015 Hazard Mitigation Assistance Guidance and Addendum

FEMA incorporated policies and guidance materials issued since the publication of the 2015 HMA Guidance and Addendum into the HMA Guide while simultaneously simplifying and streamlining HMA program guidance. Additionally, FEMA made organizational revisions to improve the user experience.

The following sections provide an overview of the changes, organized by topic area.

F.1. Program and Policy Changes

Substantial program and policy changes included in the HMA Guide are outlined in this section.

- **Building Resilient Infrastructure and Communities (BRIC) Program**: The HMA Guide supersedes FEMA Policy #104-008-05, *Building Resilient Infrastructure and Communities* (Feb. 14, 2022), by incorporating the information into Part 10. Section 1234 of the Disaster Recovery Reform Act created BRIC, amending Section 203 of the Stafford Act. Its first award cycle was in fiscal year 2020.

- **Pre-Disaster Mitigation (PDM) Grant Program**: Specific guidance for PDM was removed and language was added to clarify that FEMA may use the PDM program when administering grant funding as directed by Congress. For more information and guidance regarding the

[19] Biden-Harris Administration Launches Initiative to Modernize Building Codes, Improve Climate Resilience, and Reduce Energy Costs White House Fact Sheet (June 1, 2022)

[20] FEMA tracks current building code adoption status for state, local, tribal and territorial governments, reaching approximately 22,000 jurisdictions across the nation through Building Code Adoption Tracking, more commonly referred to as BCAT.

PDM program, refer to the relevant fiscal year's PDM Notice of Funding Opportunity, the 2015 HMA Guidance and Addendum or earlier versions, and other programmatic guidance relating to PDM.

- **HMGP Houses of Worship Eligibility:** In Part 4, FEMA does not include houses of worship in the list of eligible private nonprofit (PNPs) subapplicants for HMGP as indicated in the policy clarification, *Project Eligibility for Private Nonprofit Houses of Worship under Hazard Mitigation Assistance*, which FEMA issued after passage of the Bipartisan Budget Act of 2018. Changes in the Bipartisan Budget Act for houses of worship are applicable to the Public Assistance Program but not to HMGP. Any changes to HMGP's subapplicant eligibility criteria for PNPs must be done separately through regulation. As such, the applicable HMGP eligibility criteria for PNPs is established in 44 C.F.R. §§ 206.221(e) and 206.434(a)(2)(ii).

- **HMGP Post Fire Application Period**: The application submission time limit under 44 CFR § 206.436(d) was deemed non-applicable to the HMGP Post Fire program. Therefore, the HMGP Post Fire program has its own application period, which is clarified in Part 10.

- **HMGP Post Fire Policy**: The HMA Guide supersedes FEMA Policy #207-088-2, *Hazard Mitigation Grant Program—Post Fire* (April 29, 2019), by incorporating the information in Part 10. This policy applied to FMAG declarations issued or published on or after Oct. 5, 2018.

- **Ecosystem Services Benefits Policy**: The HMA Guide supersedes FEMA Policy # 108-024-02, *Ecosystem Service Benefits in Benefit-Cost Analysis for FEMA's Mitigation Programs*, and any FEMA materials or content relating to it. Information regarding ecosystem services benefits is incorporated into Part 5 and Part 12. FP-108-024-02 eliminated the 0.75 Benefit-Cost Analysis (BCA) threshold and permitted the consideration of ecosystem service benefits for a project regardless of BCR value. Therefore, ecosystem services benefits can be used in the BCA for all eligible HMA activities that demonstrate the restoration or enhancement of the natural environment. FP-108-024-02 superseded two previous policies:

  - **FEMA Policy #108-024-01**: *Considerations of Environmental Benefits in the Evaluation of Acquisition Projects under the Hazard Mitigation Assistance Programs* (June 18, 2013), which introduced the allowance of ecosystem service benefits if the Benefit-Cost Ratio (BCR) of an acquisition/open-space project was 0.75 or greater using traditional risk reduction benefits.

  - **FEMA policy clarification**: *Benefit-Cost Analysis Tools for Drought, Ecosystem Services, and Post-Wildfire Mitigation for Hazard Mitigation Assistance* (May 27, 2016), which stated that the inclusion of ecosystem service benefits in the BCA was no longer limited to only acquisition/open-space mitigation activities. The clarification authorized the use of ecosystem service benefits for all mitigation project types when the mitigation project was calculated to have a BCR of 0.75 or greater using traditional risk-reduction benefits.

- **Program Administration by States (PAS) Pilot Policy**: The HMA Guide supersedes the *Addendum to the Hazard Mitigation Assistance Guidance: Program Administration by States Pilot, Hazard Mitigation Grant Program* (Oct. 16, 2017) and any FEMA materials or content relating to it. The HMA Guide incorporates the PAS guidance into Part 14.
    - Additionally, FEMA updated the Minimum Eligibility Criteria Checklists, previously contained in Appendices F and G in the 2015 HMA Guidance and Addendum, and made them applicable to HMGP only and for purposes of PAS. For mitigation projects, refer to Appendix Part 16.D, and for mitigation planning activities, refer to Appendix Part 16.E.
- **National Flood Insurance Program Eligibility Requirements and Structures in the Special Flood Hazard Area (SFHA)**: The 2015 HMA Guidance and Addendum indicated that for structures that remain in the SFHA after the implementation of the mitigation project, flood insurance must be maintained for the life of the structure up to an amount at least equal to the project cost or to the maximum limit of coverage made available with respect to the particular property, whichever is less.
    - In Part 4, and based on the statutory language, FEMA clarified that for structures in the SFHA at the time of project completion and for all structures receiving assistance through FMA, flood insurance must be maintained for the life of the structure and after the completion of the mitigation project. Insurance must also be maintained regardless of whether the structure is subsequently removed from the SFHA. In addition, FEMA updated language in the notice of flood insurance requirements to correct the statutory reference and clarify that failure to obtain and maintain flood insurance for these structures will result in the property being ineligible for future HMA awards.
- **HMGP Period of Performance Updates**: In Part 8, FEMA extended the award period of performance from 36 to 48 months for HMGP to allow more time for activity completion and closeout activities. This change is made in conjunction with updates to closeout deadlines in 2 CFR Part 200. FEMA also expanded authority to regional administrators to grant up to two 12-month extensions to the HMGP period of performance. This change will alleviate the administrative burden by reducing the number of period of performance extension requests and the amount of time needed by FEMA to process them. Additionally, FEMA updated the deadline for the recipient to request an extension of the award period of performance from 60 days to 90 days before the period of performance expires.
- **HMGP Application Period Extension**: In Part 10, FEMA clarified recipient application period extension requirements and included aspects of the *Policy Memo: Hazard Mitigation Grant Program (HMGP) Application Period Extensions to Support Effective and Expedient Program Delivery*.
- **HMGP Ceiling**: In Part 10, FEMA provided additional guidance regarding HMGP assistance estimates and included aspects of the *Policy Memo: Hazard Mitigation Grant Program*

Ceiling Update. The HMA Guide supersedes the policy memo and any FEMA materials or content relating to it.

- **HMGP Obligation**: In Part 10, FEMA clarified that HMGP can only be obligated for new activities when the application period and the period of performance are open.

- **HMGP 12-Month Lock-in and De-obligation**: In Part 10, FEMA clarified that assistance for activities approved and obligated before the 12-month lock-in will not be de-obligated when the lock-in is less than the previous estimate.

- **Closeout Requirements**: FEMA added general closeout requirements in Part 9 and activity-specific closeout requirements in Part 11, Part 12 and Part 13.

  - FEMA included procedures for requesting additional information when closeout reports are deficient and information on when FEMA will administratively close out an award.

  - FEMA included a definition for 100 percent work completion.

- **Extraordinary Circumstances for Mitigation Plans**: In Part 4 and Part 9, FEMA included clarifying information about remedies of non-compliance when mitigation plans are not completed within 12 months. If FEMA grants an extraordinary circumstances exception, a local or tribal mitigation plan must be approved by FEMA within 12 months of the award of the project subaward to that community.

  - FEMA clarified that if a plan is not provided within this time frame, the project subaward will be terminated, and any costs incurred after notice of subaward termination will not be reimbursed by FEMA.

  - Additionally, FEMA clarified that if the mitigation plan is not approved by FEMA within 12 months of the award and if the subaward also involved a mitigation planning award, FEMA should notify the recipient of its failure to meet the additional specific award or subaward conditions. FEMA also should request that the issue be corrected following remedies for non-compliance procedures, which is described in Part 8. If compliance cannot be achieved, FEMA will apply a remedy action to the subaward (and planning subaward, if applicable) to address the non-compliance and may, as a result, withhold assistance, recoup assistance, or suspend or terminate the planning subaward.

- **Greatest Savings to the Fund Methodology**: Because of the changes enacted by the Biggert-Waters Flood Insurance Reform Act of 2012 FEMA discontinued the use of Greatest Savings to the Fund methodology to demonstrate cost-effectiveness and removed reference to it from the updated HMA Guide.[21]

[21] Public Law 112-141 (July 6, 2012)

- **Apportionment of HMGP Between Two Recipients**: In Part 2Part 2 and Part 10, FEMA clarified that the amount of HMGP assistance available under the disaster declaration will be apportioned among applicants if there is more than one applicant under that disaster declaration. That is, if a state and a federally recognized tribe are applicants under the same disaster declaration, then the available HMGP assistance will be apportioned among the state and the federally recognized tribe. The apportionment is based on the disaster assistance provided within tribal lands.

- **Reasonable Costs**: FEMA added information about cost eligibility and cost reasonableness principles under 2 CFR Part 200 to align with PA procedures. Generally, the HMA Guide refers to the reasonable cost principles under 2 CFR Part 200. FEMA issued the *Public Assistance: Reasonable Cost Evaluation* job aid (Oct. 13, 2018) on reasonable cost evaluation. In 2018, HMA adopted PA guidance on the reasonable cost evaluation as part of the implementation of Section 1215 of the Disaster Recovery Reform Act on Management Costs. FEMA has incorporated information from the *Public Assistance Reasonable Cost Evaluation Job Aid – Hazard Mitigation Grant Program Crosswalk* FEMA job aid (Mar. 23, 2020) in Part 4.

- **Real Property Disposition Requirements**: To comply with 2 CFR § 200.311, FEMA added information concerning the disposition of real property that was acquired or improved under HMA when the property is no longer needed for the intended purpose. FEMA included procedures for how and when the recipient must obtain disposition instructions from FEMA. In addition, FEMA added that recipients must provide a completed SF-429, "Real Property Status Report," at closeout for all property acquired and for certain project types that improve real property.

- **Clarification of Effective Date of Other Publications**: In Part 1, FEMA clarified the effective date of other government and professional publications when the HMA Guide references requirements detailed in these publications.

- **Uniform Relocation Assistance and Real Property Acquisition Policies Act**: In Part 4, FEMA clarified that projects involving acquisition, rehabilitation or demolition may be subject to the requirements of the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970 (URA).[22] Additionally, FEMA clarified that costs incurred to meet URA requirements are eligible and should be included in the subapplication budget. The 2015 HMA Guidance and Addendum included URA requirements only under the acquisition project type.

- **Insular Areas**: In Part 4, FEMA updated the list of insular areas eligible for waiver of cost share requirements. The 2015 HMA Guidance mistakenly listed Puerto Rico as an insular area although it was not included as an insular area in the applicable statute.

[22] Public Law 91-646 (Jan. 2, 1971), as amended, 42 U.S.C. Chapter 61

- **Build America, Buy America Act:** In Part 4, FEMA included information from FEMA Interim Policy #207-22-0001, *Buy America Preference in FEMA Financial Assistance Programs for Infrastructure* (Nov. 16, 2022), which establishes new procurement requirements for BRIC and FMA awards.

- **Phased Projects:** FEMA added information indicating that phased projects are eligible under BRIC and FMA.

- **Federal Flood Risk Management Standard:** FEMA incorporated the requirements from FEMA Policy #206-21-003-0001, *Partial Implementation of the Federal Flood Risk Management Standard for Hazard Mitigation Assistance Programs* (Dec. 7, 2022) in Part 4 and Part 12.

- **Pre-Award Costs:** In Part 3, FEMA provided additional information about the eligibility of pre-award costs.

- **HMGP and HMGP Post Fire 5 Percent Codes and Standards:** In Part 10 and Part 11, FEMA removed the "Additional 5 Percent Initiative" and established "5 Percent Codes and Standards." The name and requirements have been updated to provide dedicated funding to strengthen the use of building codes and standards. This funding source must be used for codes and standards activities and may be paired with the 5 Percent Initiative for a total of up to 10% of the HMGP ceiling amount or HMGP Post Fire available assistance amount.

F.1.1. REGULATORY CHANGES

- **Changes to Title 2 Code of Federal Regulations (CFR) Part 200**: The HMA Guide includes regulatory changes made in 2 CFR Part 200, published in the Federal Register on Aug. 13, 2020, that expand information on grants management requirements and procedures. The effective date of the changes was Nov. 12, 2020, except for two provisions, 2 CFR § 200.216 and 2 CFR § 200.340 that were effective on Aug. 13, 2020.

    - FEMA updated information about subaward and award deadlines in relation to the period of performance and clarified that all costs, including management costs, must be spent within the subaward or award period of performance.

    - FEMA updated the recipient closeout liquidation period from 90 to 120 calendar days and updated the deadline for recipients to submit final reports to 120 calendar days after the end of the award period of performance.

    - FEMA added information about procurement and contracting requirements under 2 CFR Part 200, including 2 CFR § 200.320 and 2 CFR § 200.321 and related documentation requirements, including the following:

        – New requirements for states to follow socioeconomic contracting steps and to encourage the use of domestic preferences.

- Prohibition on procuring certain types of covered telecommunications equipment from Huawei and ZTE Technologies, as published in FEMA Policy #405-143-1, *Prohibitions on Expending FEMA Award Funds for Covered Telecommunications Equipment or Services* (May 10, 2022).

- Allowability of non-competitive procurement methods for purchases below the micro-purchase threshold.

- FEMA updated budget and scope change requirements to align with 2 CFR § 200.308 and FEMA's Standard Terms and Conditions.

- **Updated Regulations that Impact HMA Programs**: FEMA incorporated the changes made to the HMA regulations with the final rule published on Sept. 10, 2021, and effective Oct. 1, 2021.[23]

F.1.2. EXECUTIVE ORDER CHANGES

- **Advancing Racial Equity and Support for Underserved Communities Through the Federal Government**: On Jan. 20, 2021, President Biden issued EO 13985 on *Advancing Racial Equity and Support for Underserved Communities Through the Federal Government*, which requires the federal government to "pursue a comprehensive approach to advancing equity for all, including people of color and others who have been historically underserved, marginalized, and adversely affected by persistent poverty and inequality." As a priority for FEMA and HMA, FEMA included reference to EO 13985 in Part 1.

- **Protecting Public Health and the Environment and Restoring Science to Tackle the Climate Crisis**: On Jan. 20, 2021, President Biden issued EO 13990 on *Protecting Public Health and the Environment and Restoring Science to Tackle the Climate Crisis*, which requires that the federal government "promote and protect our public health and the environment; and conserve our national treasures and monuments, places that secure our national memory." As a priority for FEMA and HMA, FEMA included reference to EO 13990 in Part 1.

- **Tackling the Climate Crisis at Home and Abroad:** On Jan. 27, 2021, President Biden Issued EO 14008 on *Tackling the Climate Crisis at Home and Abroad*, which requires the federal government to "put the climate crisis at the center of United States foreign policy and national security, while taking a government-wide approach to the climate crisis." As a priority for FEMA and HMA, FEMA included reference to EO 14008 in Part 1.

- **Climate-Related Financial Risk**: On May 20, 2021, President Biden issued EO 14030 on *Climate-Related Financial Risk,* which reinstates EO 13690 on *Establishing a Federal Flood Risk Management Standard and a Process for Further Soliciting and Considering*

[23] FEMA's final rule entitled "FEMA's Hazard Mitigation Assistance and Mitigation Planning Regulations" published at 86 FR 50653 (Sep. 10, 2021) and correction published at 86 FR 51832 (effective Sep. 17, 2021).

Stakeholder Input (Jan. 30, 2015). Through the reinstatement of EO 13690, President Biden reestablished the Federal Flood Risk Management Standard to address current and future flood risk and ensure that projects funded with taxpayer dollars last as long as intended. As a priority for FEMA and HMA, FEMA included reference to EO 14030 in Part 1.

F.1.3. COST-EFFECTIVENESS CHANGES

- **Cost-Effectiveness**: FEMA consolidated information about cost-effectiveness and principles governing the BCA into Part 5. Additionally, certain guidance issued since the 2015 HMA Guidance and Addendum has been incorporated. FEMA provided additional BCA resources to support evaluating the cost-effectiveness of various mitigation activities including aquifer recharge, storage and recovery, floodplain and stream restoration, floodwater diversion and storage, ecosystem services benefits, and post-wildfire mitigation actions.

- **Benefit Cost Analysis and Management Costs**: In Part 5, FEMA clarified that management costs may be excluded from project costs for the purpose of the BCA.

- **Benefit Cost Analysis and Social Benefits**: In Part 5, FEMA eliminated the requirement to meet a 0.75 BCR threshold before social benefits can be incorporated in a BCA.

- **Cost-Effectiveness Determinations for Acquisitions and Elevations in the SFHA Using Pre-Calculated Benefits Memorandum**: In Part 12, FEMA updated the pre-calculated benefits for acquisitions, elevations and mitigation reconstruction projects in the Special Flood Hazard Area based on an updated pre-calculated benefits memorandum published on Sept. 30, 2021, that is available on the FEMA "Benefit-Cost Analysis" webpage.

- **Pre-Calculated Benefits for Certain Hospital Generators to Demonstrate Cost-Effectiveness**: In Part 5 and Part 12, FEMA updated content by referring to pre-calculated benefits for certain hospital generators based on a memorandum published on Sept. 30, 2021, that is available on the FEMA "Benefit-Cost Analysis" webpage.

- **Benefit-Cost Analysis Efficiencies for Repetitive Loss and Severe Repetitive Loss Acquisition Projects Located Outside the Designated Special Flood Hazard Area (SFHA)**: In Part 5 and Part 12, FEMA updated content to include the use of pre-calculated benefits to demonstrate cost effectiveness for Repetitive Loss and Severe Repetitive Loss acquisition projects located outside the designated SFHA based on a memorandum published on Feb. 15, 2022, that is available on the FEMA "Benefit-Cost Analysis" webpage.

- **Water Resource Projects and the BCA Determination**: In Part 5, FEMA clarified that water resource projects are not exempt from the HMA statutory requirement to demonstrate cost-effectiveness even though these projects are exempt under the Office of Management and Budget's Circular A-94, *Guidelines and Discount Rates for Benefit-Cost Analysis of Federal Programs*. The cost-effectiveness determination should be supplemented by consideration of the White House Council on Environmental Quality's *Updated Principles, Requirements and*

Guidelines for Water and Land Related Resources Implementation Studies criteria if applicable.

- **BCA Guidance for Floodplain and Stream Restoration Projects**: In Part 12, FEMA included more information on the cost-effectiveness of floodplain and stream restoration projects from the *Supplemental BCA Guidance for Floodplain and Stream Restoration Projects*.

- **BCA Guidance for Floodwater Diversion and Storage Projects**: In Part 12, FEMA included more information on the cost-effectiveness of floodwater diversion and storage projects from the *Supplemental BCA Guidance for Floodwater Diversion and Storage Projects*.

- **Cost Effectiveness Determination for Non-Residential Hurricane Wind Retrofit Measures**: In Part 12, FEMA included more information on the cost-effectiveness of non-residential hurricane wind retrofits from the *Cost Effectiveness Determination for Non-Residential Hurricane Wind Retrofit Measures Funded by FEMA Memorandum*.

F.1.4. MANAGEMENT COSTS CHANGES

- **HMGP Management Cost Interim Policy**: The HMA Guide supersedes FEMA Policy #104-11-1, *Hazard Mitigation Grant Program Management Costs (Interim)* (Nov. 14, 2018). The interim policy applied to all major disasters declared on or after Aug. 1, 2017. FEMA has also incorporated information from *Hazard Mitigation Grant Program Management Costs Policy (Interim)* (March 23, 2020) frequently asked questions document.

  - The HMA Guide supersedes the interim policy. Information regarding management costs for HMGP and HMGP Post Fire is included in Part 10 and Part 13. Any FEMA materials or content relating to the interim policy is hereby made final. The interim policy was developed to carry out amendments to Section 324 of the Stafford Act by Section 1215 of the Disaster Recovery Reform Act. As a result, 44 CFR Part 207, which implemented Section 324 prior to the amendment, and the chapters relating to HMGP management costs in the 2015 HMA Guidance and Addendum were no longer effective and were superseded.

  - FEMA has clarified how to calculate management costs based on the total amount of the award, subapplication requirements, and procedures for incremental obligation and closeout.

  - FEMA removed the provision from the interim policy requiring FEMA to develop an agreement with the recipient to outline the release of funding for management cost awards over $6 million. FEMA instead incorporated information from *the Hazard Mitigation Grant Program Management Costs Policy (Interim)* frequently asked questions document that set thresholds for incremental funding requirements.

  - To align the HMGP management cost policy with revisions to 2 CFR Part 200, FEMA simplified information regarding when a subrecipient or recipient can claim management

costs. In Part 13, FEMA removed language that stated that management costs must be claimed within 180 days after work is completed; within 180 days after the latest period of performance of the last nonmanagement cost HMGP project; or eight years from the date of the disaster declaration. Removing this language means that there is no longer an eight-year period of availability. Instead, FEMA clarified that management costs must be incurred within the subaward or award period of performance.

- **Management Costs and Total Amount of the HMGP Award**: In Part 10, FEMA clarified that, for management cost calculation, the "total amount of the HMGP award" means the total amount of contributions based on applications submitted when the HMGP application period closes or when the total HMGP ceiling is determined, whichever is later. Similarly, the "total amount of the HMGP Post Fire award" means the total amount of contributions based on applications submitted when the HMGP Post Fire application period closes or when the total HMGP Post Fire available assistance amount is determined, whichever is later. FEMA also clarified that in cases where the recipient submits subapplications in excess of the HMGP ceiling (or for HMGP Post Fire, the available assistance amount), FEMA will only calculate management costs on subapplication amounts up to the final HMGP ceiling amount or HMGP Post Fire available assistance amount.

- **Management Costs for Project Scoping/Advance Assistance**: The 2015 HMA Guidance and Addendum indicated that FEMA does not provide management costs for purposes of project scoping/advance assistance and noted that management costs may only be awarded in conjunction with project or planning awards and subawards. FEMA has since removed the restriction that management costs may only be awarded in conjunction with a project or planning award or subaward and has specified that project scoping/advance assistance subawards are eligible for management costs. Refer to Part 13 for more information.

- **HMGP and HMGP Post Fire Management Costs**: For HMGP and HMGP Post Fire, FEMA clarified in Part 10 that recipients cannot receive an additional 5% for management costs if also acting as a subrecipient.

F.2. Project and Activity Changes

Substantial project and activity related changes included in the HMA Guide are outlined in this section.

- **Eligibility of HMA Applications with Pre-Award Demolitions**: FEMA has generally found acquisitions, mitigation reconstruction and other mitigation projects that included properties with structures that had been demolished prior to application to FEMA as ineligible for HMA funding because of its interpretation of these costs as "pre-award costs."

  - **FEMA issued a policy clarification**: *Eligibility of Hazard Mitigation Assistance Applications with Pre-Award Demolitions* (Aug. 26, 2019), specifying that when a property owner uses private funds to demolish an event-damaged structure—and the property had not been in

an application submitted to FEMA at the time of the demolition—the demolition is not a "connected action" under the National Environmental Policy Act (i.e., is not connected to the FEMA federal project).[24]

- Therefore, the demolition is not subject to FEMA review and approval for Environmental and Historic Preservation compliance, the costs of the demolition are not considered pre-award costs, and the demolition does not preclude a finding of project eligibility. The demolition must be in accordance with state and local legal requirements as well as any applicable federal law.

- The HMA Guide supersedes the policy clarification and any FEMA materials or content relating to it, unless stated otherwise, and information regarding pre-award demolitions is in Part 4 and Part 12.

- **Eligibility of Non-Localized Flood Risk Reduction Projects under FMA**: In Part 12, FEMA updated content to reflect that non-localized flood risk reduction projects may be eligible for FMA if the Administrator specifically determines in approving a mitigation plan that such activities are the most cost-effective mitigation activities for the National Flood Mitigation Fund. This change reflects revisions to the FMA regulations that became effective Oct. 1, 2021.

- **Codes and Standards Activities**: In Part 11, FEMA provided more information on codes and standards as eligible HMA activities.

- **Nature-Based Solutions**: In Part 12, FEMA provided more information on the eligibility of nature-based solutions for many different project types and included an overarching philosophy to encourage these approaches.

- **Acquisition Projects**: The HMA Guide incorporates FEMA Policy #302-094-0333, *Hazard Mitigation Assistance Acquisition Projects: Hydraulic Fracturing and Horizontal Directional Drilling* (July 6, 2017), and information regarding acquisition projects is in Part 12. The HMA Guide supersedes the policy and any FEMA materials or content relating to it, unless stated otherwise. FEMA also clarified recipient responsibilities and requirements for post-closeout monitoring and reporting, including requirements to review post-acquisition land uses based on 44 CFR § 80.19 in Part 12.

- **Mitigation Reconstruction Projects**: In Part 12, FEMA updated the cap on the federal cost share for mitigation reconstruction from $150,000 to $220,000 per structure. FEMA also clarified that it will no longer provide square-foot cost estimates for mitigation reconstruction projects.

[24] Public Law 91-190 (Jan. 1, 1970), 42 U.S.C. § 4321

- **Sinkhole Projects**: The HMA Guide supersedes the FEMA policy clarification: *Acquisition and Relocation or Demolition of Structures on or near Sinkholes* (April 24, 2015), which clarified the eligibility of acquisition and relocation of demolition projects when the structure is subject to sinkhole hazards. Information regarding the policy clarification is in Part 12.

- **Safe Room Projects**: In Part 12, FEMA updated requirements to align with FEMA P-361, *Safe Rooms for Tornadoes and Hurricanes: Guidance for Community and Residential Safe Rooms, Fourth Edition* (April 2021), and the 2020 edition of International Code Council (ICC) 500, *ICC/National Storm Shelter Association Standard for the Design and Construction of Storm Shelters*.

- **Secondary Power Source Projects:** The HMA Guide supersedes the FEMA fact sheet**:** *Hazard Mitigation Assistance Grant Funding for Microgrid Projects* and the FEMA job aid: *Eligibility of Generators as a Fundable Project by the Hazard Mitigation Grant Program and Pre-Disaster Mitigation Program*. Information regarding these topics is in Part 12. In addition, FEMA expanded the eligibility of secondary power source projects, including generators, microgrids, solar photovoltaic systems, and battery back-up systems.

- **Tsunami Vertical Evacuation Refuge Projects**: In Part 4 and Part 12, FEMA provided updated guidance for tsunami vertical evacuation refuge projects.

- **Wind Retrofit for Non-Residential Buildings Projects**: In Part 12, FEMA expanded the eligibility of wind retrofits to non-residential structures under HMGP and BRIC.

- **Wildfire Mitigation Activities**: FEMA provided updated guidance for post-wildfire flood prevention activities and fire suppression systems, and removed the requirement that hazardous fuels reduction projects must be located within a 2-mile distance of an at-risk building or structure to be eligible to receive assistance under HMA grant programs. The update is reflected in Part 12.

- **Beach Nourishment Projects**: In the 2015 Guidance, beach nourishment was listed as an ineligible mitigation activity. Beach nourishment is now eligible based on the FEMA Policy #204-078-112-1, *Eligibility of Flood Risk Reduction Measures under the Hazard Mitigation Assistance (HMA) Programs* (June 27, 2014). The HMA Guide supersedes this policy. FEMA also added information to clarify the eligibility of these activities under shoreline stabilization in Part 12.

- **New Information on Mitigation Planning as an Eligible HMA Activity**: Planning is one of the cornerstones of effective hazard mitigation activities. Therefore, FEMA included additional guidance and resources in Part 3 and Part 11 regarding mitigation plan creation and updates and planning-related activities. Also, FEMA strengthened language in Part 2 to reinforce the connection across planning and project identification, selection and scoping.

- **Planning Related Activities**: In Part 11, FEMA included more detailed information on the eligibility of planning-related activities from the *Hazard Mitigation Grant Program Planning-Related Activities* FEMA fact sheet.

- **Aquifer Recharge, Storage and Recovery Projects**: The HMA Guide supersedes the FEMA fact sheet: *Aquifer Storage and Recovery*, and any materials and related content. Information regarding aquifer recharge, storage and recovery is in Part 12.

- **Flood Diversion and Storage Projects**: The HMA Guide supersedes the FEMA fact sheet: *Flood Diversion and Storage*, and any materials and related content. Information regarding flood diversion and storage projects is in Part 12.

- **Floodplain and Stream Restoration Projects**: The HMA Guide supersedes the FEMA fact sheet: Floodplain and Stream Restoration, and any materials and related content. Information regarding floodplain and stream restoration projects is in Part 12.

- **Extreme Temperature Projects**: In Part 12, FEMA included information on the eligibility of activities that mitigate extreme temperature from the *Mitigating the Risk of Extreme Temperatures with Hazard Mitigation Assistance Funds* FEMA fact sheet.

- **Partnership Activities:** In Part 11, FEMA added information indicating that partnership activities are eligible for BRIC and FMA.

- **Floodproofing:** In Part 12, FEMA clarified the differences between wet and dry floodproofing and their eligible uses.

F.3. General Changes

General changes included in the HMA Guide are outlined in this section.

- **HMA Guidance and Addendum**: The 2015 version of the HMA Guidance consisted of two volumes: (1) The HMA Guidance, which contained the general principles applicable to all HMA programs; (2) The Addendum, which listed eligible project types under all HMA programs. Stakeholders indicated that having multiple documents and parts governing the HMA programs can sometimes be confusing. The updated HMA Guide retains this distinction between generally applicable principles and activity types. However, FEMA incorporated the Addendum into the HMA Guide to improve usability.

- **Job aids, fact sheets and policy clarifications to bolster existing guidance**: Since the publication of the 2015 HMA Guidance and Addendum, FEMA has issued additional guidance in the form of fact sheets, policy clarifications and job aids for HMA-eligible activities, including aquifer recharge, storage and recovery; floodplain and stream restoration; flood diversion and storage; and generators. FEMA incorporated relevant content found within these guidance documents into the project-specific parts of the HMA Guide throughout and specifically in Part 12. Job aids describing eligible HMA activities remain in

effect despite their inclusion in the HMA Guide to the extent they are consistent with the content of the HMA Guide. Additionally, FEMA reorganized and bolstered the HMA Guide to further highlight capability and capacity building, management costs and project specific criteria.

- **Information Regarding "Frontloading HMA Program Eligibility Requirements"**: Information from 2015 HMA Guidance and Addendum, Part II, "Frontloading HMA Program Eligibility Requirements," was incorporated in other parts of the document, as appropriate. Part II information was moved to Part 3, which outlines items that applicants and subapplicants should consider before they apply, such as creating or updating a mitigation plan, selecting mitigation activities, scoping, considering assistance strategies, and making activity eligibility determinations.
- The following Disaster Recovery Reform Act provisions were considered when developing the HMA Guide :
  - 1204 Wildfire Prevention.
  - 1205 Additional Activities: Wildfire and Windstorm.
  - 1210(b) Federally Authorized Water Resources Development Project.
  - 1215 Management Costs.
  - 1231 Guidance on Hazard Mitigation – Acquisition.
  - 1233 Additional Hazard Mitigation Activities – Earthquake Early Warning.
  - 1234 National Public Infrastructure Pre-Disaster Hazard Mitigation.
  - 1235(a) Additional Mitigation Activities.
- **Budget**: FEMA replaced most references to "cost estimate" with "budget" to align with the definition in 2 CFR Part 200.
- **Hazard Mitigation Officer:** The HMA Guide transitioned the "state hazard mitigation officer" title to "hazard mitigation officer" to be more inclusive of tribes and territories.
- **Ineligible Activities:** FEMA clarified language in the list of ineligible activities section in Part 4 regarding projects in the Coastal Barrier Resources System, water quality infrastructure projects, activities involving other federal entities, wildfire activities, and response/preparedness activities. This list was formerly in Part III.E.2 in the 2015 HMA Guidance.

Introduction Resources

- Whole Community Guiding Principle: https://www.fema.gov/glossary/whole-community
- Community Lifelines: https://www.fema.gov/emergency-managers/practitioners/lifelines
- *National Mitigation Investment Strategy*: https://www.fema.gov/sites/default/files/2020-10/fema_national-mitigation-investment-strategy.pdf
- *National Mitigation Framework*: https://www.fema.gov/sites/default/files/2020-04/National_Mitigation_Framework2nd_june2016.pdf
- FEMA Resources for Climate Resilience: https://www.fema.gov/sites/default/files/documents/fema_resources-climate-resilience.pdf
- Climate Risk and Resilience Portal: https://disgeoportal.egs.anl.gov/ClimRR/
- National Risk Index: https://hazards.fema.gov/nri/
- Climate Mapping for Resilience and Adaptation: https://resilience.climate.gov/
- National Oceanic and Atmospheric Administration's Sea Level Rise Viewer: https://coast.noaa.gov/digitalcoast/tools/slr.html
- U.S. Climate Resilience Toolkit: https://toolkit.climate.gov/
- Heat.gov: https://www.heat.gov/
- Drought.gov: https://www.drought.gov/
- National Oceanic and Atmospheric Administration Sea Level Rise Portal: https://oceanservice.noaa.gov/hazards/sealevelrise/
- *Protecting Communities and Saving Money: The Case for Adopting Building Codes*: https://www.fema.gov/sites/default/files/2020-11/fema_building-codes-save_brochure.pdf
- *Building Codes Save: A Nationwide Study*: https://www.fema.gov/emergency-managers/risk-management/building-science/building-codes-save-study
- *FEMA Building Codes Strategy*: https://www.fema.gov/emergency-managers/risk-management/building-science/building-codes-strategy
- *Building Codes Adoption Playbook For Authorities Having Jurisdiction*: https://www.fema.gov/sites/default/files/documents/fema_building-codes-adoption-playbook-for-authorities-having-jurisdiction.pdf
- FEMA Nationwide Building Code Adoption Tracking: https://www.fema.gov/emergency-managers/risk-management/building-science/bcat

Part 2. Overview of Hazard Mitigation Assistance Programs

The Federal Emergency Management Agency (FEMA) Hazard Mitigation Assistance (HMA) programs support mitigation activities that reduce or eliminate potential losses to state, local, tribal and territorial governments, fostering resilience against the effects of disasters.

FEMA administers HMA programs that provide funding for hazard mitigation activities including mitigation projects and capability- and capacity-building. The following programs are covered in the HMA Guide:[25]

1. Hazard Mitigation Grant Program (HMGP).
2. Hazard Mitigation Grant Program Post Fire (HMGP Post Fire).
3. Building Resilient Infrastructure and Communities (BRIC).
4. Flood Mitigation Assistance (FMA).

Part 2 provides an overview of HMGP, HMGP Post Fire, BRIC and FMA including the statutory and regulatory authorities that govern them. Unique aspects of each of these programs are detailed in Part 10. Part 2 also provides an outline of authorities governing grants management, an integral part of the administration of HMA programs. It also briefly outlines the roles and responsibilities of state, local, tribal and territorial governments and who can benefit from the HMA programs.

A. Hazard Mitigation Grant Program

HMGP ensures that state, local, tribal and territorial governments have the financial opportunity to plan for and implement mitigation measures that reduce the risk of loss of life and property from future natural disasters during the reconstruction process following a disaster. HMGP is authorized by Section 404 of the Robert T. Stafford Disaster Relief and Emergency Assistance Act (Stafford Act)[26] and implemented in regulations at 44 Code of Federal Regulations (CFR) §§ 206.430-440.

HMGP funding is available when authorized through a major disaster declaration. A governor,[27] tribal chief executive, or equivalent, may request that HMGP funding be available to the state or territory that was affected by the declared disaster. Federally recognized tribal governments, through their

[25] The HMA Program and Policy Guide applies to the Pre-Disaster Mitigation (PDM) program as described in the relevant NOFO. FEMA intends to announce these funding opportunities through Notices of Funding Opportunity, which will specify the applicable program requirements.
[26] Public Law 100-707 (Nov. 23, 1988); amending the Disaster Relief Act of 1974, Public Law 93-288 (May 22, 1974)
[27] 42 U.S.C. § 5122(5)

tribal chief executive,[28] may also submit a request for a disaster declaration within their impacted areas and request that HMGP funding be made available to them under that declaration. Upon the declaration of a major disaster or an emergency, the governor or tribal chief executive and the FEMA regional administrator or designee shall execute a FEMA-State Agreement or FEMA-Tribal Agreement. The Agreements state the understandings, commitments and conditions for assistance under which FEMA disaster assistance shall be provided.[29] For more information about the declaration process, refer to 44 CFR §§ 206.31 – 49b or visit the FEMA "How a Disaster Gets Declared" webpage.

The amount of HMGP funding available to the applicant is based on the estimated total federal assistance, subject to the sliding scale formula that FEMA provides for disaster recovery for each disaster declaration.[30] The formula provides for:

- Up to 15% of the first $2 billion of estimated aggregate amounts of disaster assistance.
- Up to 10% for amounts between $2 billion and $10 billion.
- Up to 7.5% for amounts between $10 billion and $35.333 billion.

For states and federally recognized tribal governments with enhanced mitigation plans, the eligible assistance is up to 20% for estimated aggregate amounts of disaster assistance, not to exceed $35.333 billion. The sliding scale does not apply to recipients with enhanced mitigation plans. For more information on how to advance mitigation planning to become enhanced, visit the FEMA "Regulations and Guidance" webpage.

The amount of HMGP funding available under the disaster declaration is apportioned among the applicants if there is more than one applicant. For example, if a state and a federally recognized tribe are applicants under the same disaster declaration, then the available HMGP funding is apportioned among the state and the federally recognized tribe. The apportionment is based on the disaster assistance provided within tribal land.

The award period of performance for HMGP begins with the opening of the application period and ends no later than 48 months from the close of the application period.

All applicants and subapplicants must have a FEMA-approved mitigation plan that has been adopted by the jurisdiction in accordance with 44 CFR Part 201 and applicable mitigation planning policies to receive HMGP funding.

In addition, recipients are required to prepare an HMGP Administrative Plan, which must be approved by FEMA. The HMGP Administrative Plan is a procedural guide that details how the recipient will administer HMGP awards.

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[28] 42 U.S.C. § 5122(12)
[29] 44 CFR § 206.44
[30] 44 CFR § 206.432(b)

For more HMGP guidance, refer to Part 10.

B. Hazard Mitigation Grant Program Post Fire

HMGP Post Fire assistance is available to help communities implement hazard mitigation measures after wildfire disasters in any area that receives a Fire Management Assistance Grant (FMAG) declaration.

Section 1204 of the Disaster Recovery Reform Act of 2018[31] amended Section 404 of the Stafford Act to allow FEMA to provide HMGP Post Fire assistance for hazard mitigation measures that substantially reduce the risk of future damage, hardship, loss or suffering in any area affected by a fire for which assistance was provided under Section 420 of the Stafford Act.[32] Therefore, unlike HMGP, the availability of HMGP Post Fire assistance is not contingent on a major disaster declaration and is instead triggered by an FMAG declaration.[33] Eligible activities may be outside of the declared area as long as the risk reduction benefits include the declared county or counties (e.g., watershed mitigation). If funding cannot be used in the declared areas, it may be made available statewide.

States and territories that have received an FMAG declaration and certain federally recognized tribes are eligible to apply for assistance under HMGP Post Fire.

Federally recognized tribes have multiple options for applying for HMGP Post Fire. Under an FMAG declaration made to a state or territory, federally recognized tribes with burned land from the FMAG declared event may request an HMGP award as recipients. Tribes (including federally recognized tribes) may also apply through the state to FEMA as subapplicants. Subapplicants will follow the standard HMGP subapplicant procedures consistent with program guidance including updates in effect at the time of the FMAG declaration.

All applicants and subapplicants must have a FEMA-approved mitigation plan that has been adopted by the jurisdiction in accordance with 44 CFR Part 201 and applicable mitigation planning policies to receive HMGP Post Fire funding. In addition, recipients are required to prepare an HMGP Administrative Plan that must be approved by FEMA. The HMGP Administrative Plan is a procedural guide that details how the recipient will administer HMGP Post Fire awards.

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[31] Division D of Public Law 115-254 (Oct. 5, 2018)

[32] As amended, Section 420(d) of the Stafford Act states that "whether or not a major disaster is declared, the President may provide hazard mitigation assistance in accordance with Section 404 [of the Stafford Act] in any area affected by a fire for which assistance was provided under this section." Section 1204 of the Disaster Recovery Reform Act also amended Section 420 of the Stafford Act to parallel the change in Section 404. Section 420 of the Stafford Act authorizes FEMA to provide assistance under its FMAG program for the mitigation, management and control of any fire that threatens such destruction as would constitute a major disaster.

[33] 44 CFR § 204.21

Upon the declaration of a major disaster or an emergency, the governor or tribal chief executive and the FEMA regional administrator or designee, shall execute a FEMA-State Agreement or FEMA-Tribal Agreement. The Agreements state the understandings, commitments, and conditions for assistance under which FEMA disaster assistance shall be provided.[34] For more information about the declaration process, refer to 44 CFR §§ 206.31 – 49b or visit the FEMA "How a Disaster Gets Declared" webpage.

A signed FEMA-State Agreement or FEMA-Tribal Agreement is required to implement the HMGP Post Fire award following FMAG declarations. HMGP Post Fire is implemented pursuant to the FMAG state or tribal agreement.

For more HMGP Post Fire guidance, refer to Part 10.

C. Building Resilient Infrastructure and Communities

BRIC supports state, local, tribal and territorial governments as they undertake hazard mitigation activities, reducing the risks they face from disasters and natural hazards. The BRIC program seeks to fund effective and innovative activities that will reduce risk, increase resilience, and serve as a catalyst to encourage the whole community to invest in and adopt mitigation policies. BRIC is designed to promote a national culture of preparedness and public safety by encouraging investments to protect our communities and infrastructure and strengthen our national mitigation capabilities to foster resilience.

BRIC was established as part of Section 1234 of the Disaster Recovery Reform Act, which amended Section 203 of the Stafford Act.[35] In its amended version, Section 203 of the Stafford Act authorizes FEMA to provide technical and financial assistance to state, local, tribal and territorial governments for hazard mitigation measures that are cost-effective and designed to reduce injuries, loss of life and damage and destruction of property. This includes damage to critical services and facilities.

The BRIC program is designed around the following guiding principles:

- Support state and local governments, tribes and territories through capability- and capacity-building to enable them to identify mitigation actions and implement projects that reduce risks posed by natural hazards.
- Encourage and enable innovation while allowing flexibility, consistency, and effectiveness.
- Promote partnerships and enable high-impact investments to reduce risk from natural hazards with a focus on critical services and facilities, public infrastructure, public safety, public health and communities.

[34] 44 CFR § 206.44

[35] Public Law 100-707 (Nov. 23, 1988); amending the Disaster Relief Act of 1974, Public Law 93-288 (May 22, 1974)

- Provide a significant opportunity to reduce future losses and minimize impacts on the Disaster Relief Fund (DRF).
- Promote equity, including by helping members of disadvantaged groups and prioritizing 40% of the benefits to disadvantaged communities as referenced in Executive Order (EO) 14008 on *Tackling the Climate Crisis at Home and Abroad* (Jan. 27, 2021), in line with the Administration's Justice40 Initiative.
- Support the adoption and enforcement of building codes, standards, and policies that will protect the health, safety, and general welfare of the public, taking into account future conditions, prominently including the effects of climate change, and have long-lasting impacts on community risk reduction, including for critical services and facilities and for future disaster costs.

States and territories that have had a major disaster declaration under the Stafford Act in the seven years prior to the annual application period start date are eligible to apply for federal assistance under BRIC as applicants. Federally recognized tribal governments can apply directly to FEMA for federal assistance under BRIC as an applicant or through the state as a subapplicant. Federally recognized tribal governments that have had a major disaster declaration under the Stafford Act in the seven years prior to the annual application period start date——or are entirely or partially located in a state that had a major disaster declaration in the seven years prior to the annual application period start date——are eligible to apply as applicants. Local governments and tribes are eligible to apply to states and territories for federal assistance under BRIC as subapplicants.[36] Individuals, businesses and nonprofit organizations are not eligible to apply for BRIC assistance; however, an eligible applicant or subapplicant may apply for funding on behalf of individuals, businesses and nonprofit organizations.

The BRIC program distributes assistance annually and requires a cost share.[37] No later than 180 calendar days after each major disaster is declared under the Stafford Act and subject to assistance availability, FEMA calculates the estimated aggregate amount of grants to be made under Sections 403 ("Essential Assistance"), 406 ("Repair, Restoration, and Replacement of Damaged Facilities"), 407 ("Debris Removal"), 408 ("Federal Assistance to Individuals and Households"), 410 ("Unemployment Assistance"), 416 ("Crisis Counseling Assistance and Training") and 428 ("Public Assistance Program Alternative Procedures") of the Stafford Act for the major disaster. FEMA may set aside up to 6% of that amount from the Disaster Relief Fund for deposit into the National Public Infrastructure Pre-disaster Mitigation Fund to fund BRIC. The amount set aside must not reduce the amounts otherwise made available under the referenced sections. FEMA assesses the amount of funding set aside for BRIC annually and determines what portion of that amount will be available

[36] 2 CFR § 200.1 and 42 U.S.C. 5122(7).

[37] Under Section 203(h) of the Stafford Act, the federal assistance may contribute up to 75% of the total cost of mitigation activities approved by FEMA. In certain cases, the federal assistance may increase to up to 90%.

during the following application period for the BRIC program. FEMA announces its determination in the annual Notice of Funding Opportunity (NOFO) for the BRIC program.

All applicants and subapplicants must have a FEMA-approved mitigation plan that has been adopted by the jurisdiction in accordance with 44 CFR Part 201 and applicable mitigation planning policies by the application deadline and at the time FEMA obligates funding for mitigation activities. For more information on applicable mitigation planning policies, refer to the FEMA "Hazard Mitigation Planning" webpage.

For more BRIC guidance, refer to Part 10.

D. Flood Mitigation Assistance

FMA is a competitive program that provides funding to states, local communities, federally recognized tribes and territories. Funds can be used for projects that reduce or eliminate the risk of flood damage to structures insured by the National Flood Insurance Program (NFIP).

The National Flood Insurance Reform Act of 1994 amended Section 1366 of the National Flood Insurance Act of 1968 and directed FEMA to provide financial assistance in the form of grants for planning and carrying out activities designed to reduce the risk of flood damage to structures covered under contracts for flood insurance with the NFIP.[38] The Biggert-Waters Flood Insurance Reform Act of 2012 consolidated the Repetitive Flood Claims and Severe Repetitive Loss grant programs into FMA.[39] FMA regulations can be found at 44 CFR Part 77.

FMA funding is available through the National Flood Insurance Fund for flood hazard mitigation activities and plan development and is appropriated by Congress on a yearly basis. States, territories and federally recognized tribes[40] are eligible to apply for FMA assistance. NFIP participation is required to be eligible for funding; subapplicants must also be in "good standing" with the NFIP. FEMA publishes an up-to-date community status on the "Community Status Book" webpage. Local governments and non-federally recognized tribes are considered subapplicants and must apply to their applicant state, territory or federally recognized tribe. Annual priorities and other program information is communicated through the NOFO.

The period of performance for FMA is outlined in the NOFO. The relevant fiscal year NOFO should be referenced to verify conditions pertaining to the start, duration and end of the period of performance.

All applicants and subapplicants must have a FEMA-approved mitigation plan that has been adopted by the jurisdiction in accordance with 44 CFR Part 201 and applicable mitigation planning policies to

[38] Public Law 103-325 (Sep. 23, 1994); Public Law 90-448 (Aug. 1, 1968), as amended, 42 U.S.C. § 4104(c)
[39] Public Law 112-141 (July 6, 2012)
[40] 44 CFR § 77.2(f)

apply for and receive FMA funding.[41] Other eligibility requirements include that mitigation activities must be technically feasible and cost-effective, or eliminate future payments from the National Flood Insurance Fund for severe repetitive loss structures through an acquisition or relocation activity.[42]

For more FMA guidance, refer to Part 10.

Table 2 provides a high-level summary of the programs covered by this guide.

[41] According to 44 CFR § 77.6(b), the approved mitigation plan must provide for reduction of flood losses to structures for which NFIP coverage is available. The FEMA-approved mitigation plan is required at the time of application and award.
[42] 41 U.S.C. § 4104c.

Table 2. HMA Program Comparison

HMA Program Comparison	 HMGP	 HMGP Post Fire	 BRIC	 FMA
Program Type	Post-disaster	Post-disaster	Pre-disaster	Pre-disaster
Funding Availability	Presidentially declared disaster	FMAG-declared disaster	6% set aside from federal post-disaster grant funding	Annual appropriations
Competitive?	No	No	Yes	Yes
Eligible Applicants	States, federally recognized tribes, territories and the District of Columbia (DC)	States, federally recognized tribes, territories and DC	States, federally recognized tribes, territories and DC	States, federally recognized tribes, territories and DC
Eligible Subapplicants	State agencies, local governments, tribes and private nonprofit organizations	State agencies, local governments, tribes and private nonprofit organizations	State agencies, local governments and tribes	State agencies, local governments and tribes
Hazard Mitigation Plan Requirement	Yes	Yes	Yes	Yes
NFIP Participation	Communities with projects in Special Flood Hazard Areas (SFHAs)	Communities with projects in SFHAs	Communities with projects in SFHAs	Subapplicants and properties

E. Grants Management Regulations

Grants management plays an integral part in implementing HMA programs and dictates the procedures for FEMA officials responsible for administering funds during program implementation.

On Dec. 26, 2014, the Department of Homeland Security adopted the *Uniform Administrative Requirements, Cost Principles, and Audit Requirements for Federal Awards* (Administrative Requirements), which are codified in 2 CFR Part 200.[43]

2 CFR Part 200 generally applies to FMA and BRIC awards made on or after Dec. 26, 2014, and to all HMGP and HMGP Post Fire awards made under emergency or major disaster declarations declared on or after Dec. 26, 2014.[44]

FEMA also issues regulations, NOFOs and other guidance for HMA programs based on a program's authorizing statute. FEMA regulations have the force of law. These regulations, NOFOs and guidance documents also outline program parameters and procedures, including various administrative processes. While FEMA follows 2 CFR Part 200 for general grant administrative requirements, cost principles and single audit requirements, FEMA HMA-specific regulations take precedence over 2 CFR Part 200 if the HMA regulation is more specific.

F. Roles and Responsibilities of State, Local, Tribal and Territorial Governments

Unlike other federal assistance programs, individuals (such as property and business owners) or private nonprofits (with some exceptions) may not apply directly for HMA funding with FEMA. It is the role of states, federally recognized tribes and territories to apply for HMA funding in accordance with the instructions and principles outlined in the HMA Guide.

Therefore, individuals or nonprofits interested in implementing mitigation activities must work with their local governments (e.g., their local community planning office, emergency management office, hazard mitigation office, or, in certain cases, with eligible nonprofit organizations) to develop activities that could reduce property and other damage from future natural disasters in accordance with their local hazard mitigation plan. These local governments (acting as subapplicants) apply to their state, federally recognized tribes or territory for consideration of being included in a FEMA HMA application.

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[43] The Department of Homeland Security adoption of 2 CFR Part 200 is codified in 2 CFR Part 3002. These regulations incorporated, superseded and streamlined requirements from certain Office of Management and Budget (OMB) circulars. Upon the adoption of the Administrative Requirements in 2 CFR Part 200, FEMA removed 44 CFR Part 13 from the CFR.

[44] The superseded OMB circulars and guidance, including 44 CFR Part 13, continue to apply to all PDM and FMA awards made prior to Dec. 26, 2014, or HMGP awards made under emergency or major disaster declarations declared before Dec. 26, 2014. For details, refer to the 2015 HMA Guidance.

The states, federally recognized tribes and territories (acting as applicants or recipients) have established mitigation priorities in their hazard mitigation plans. They are tasked with facilitating the development of subapplications from local jurisdictions (subapplicants or subrecipients) and to apply, on behalf of the local jurisdictions, to FEMA HMA programs, based on state, federally recognized tribal or territorial criteria and available assistance.

FEMA only accepts applications submitted by states, federally recognized tribes and territories (applicants). Upon receipt of the application, FEMA conducts an eligibility review to ensure compliance with federal laws, regulations and other directives before it approves a subapplication and grants a subaward. If the application is approved, funding is issued to applicants/recipients who, in turn, work with subapplicants/subrecipients to complete the activities included in the applications.

Figure 1 outlines the application process from the perspective of the various stakeholders. The following sections outline in greater detail the roles and responsibilities of applicants/recipients and subapplicants/subrecipients involved in the HMA process.

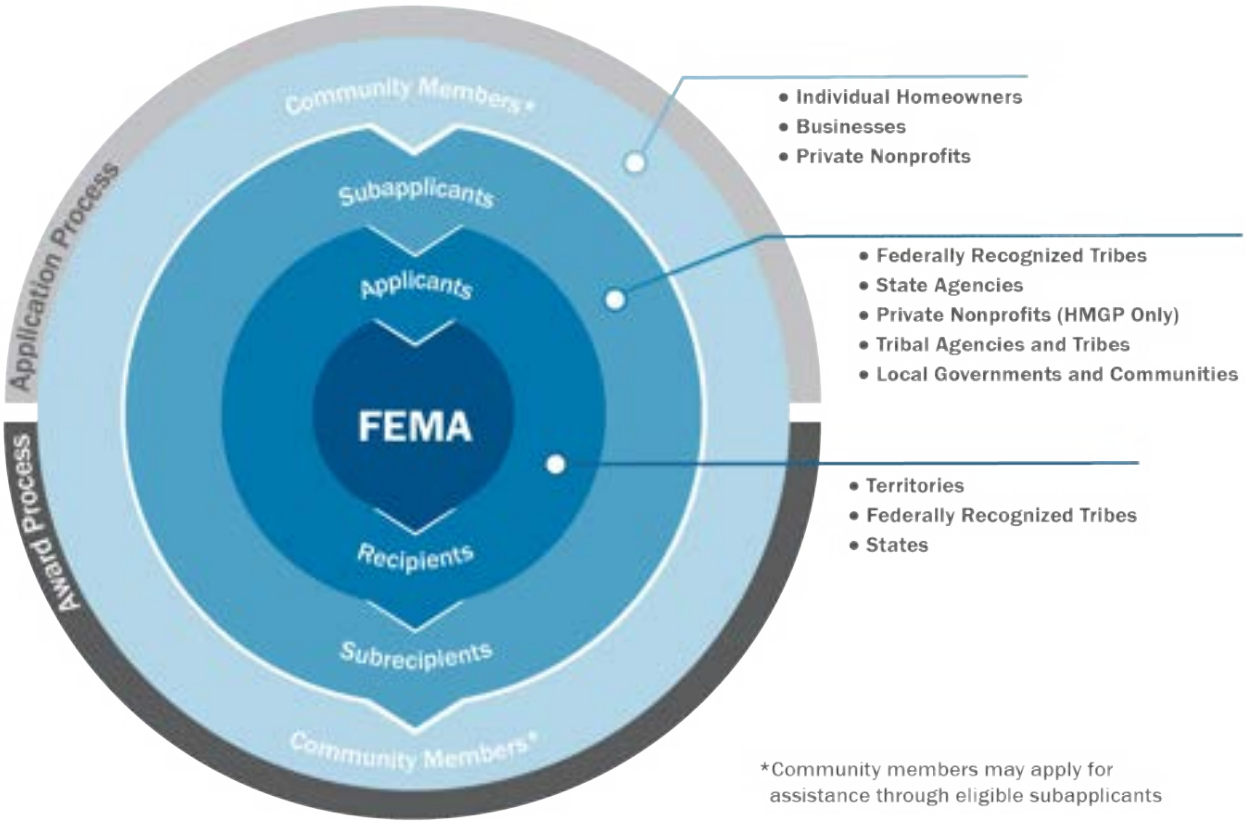

Figure 1. Roles of State, Local, Tribal and Territorial Entities Throughout the HMA Process

F.1. Applicants/Recipients

States, federally recognized tribes and territories are eligible applicants for HMA programs. The applicant is responsible for soliciting subapplications from eligible subapplicants and assisting in the preparation, review and submission of eligible and complete subapplications to FEMA. Applicants receive HMA awards. When assistance is awarded, the applicant then becomes the recipient and a pass-through entity. A recipient receives a federal award directly from FEMA to carry out an activity under an HMA program.[45] Pass-through entities are responsible for administering the award and complying with program requirements and other applicable federal, state, tribal and territorial laws and regulations. The pass-through entity is also responsible for the financial management of the program and oversight of all approved activities.[46]

To be eligible for HMA programs, applicants must have a FEMA-approved state or tribal hazard mitigation plan that has been adopted by the jurisdiction in accordance with 44 CFR Part 201 and state or tribal mitigation planning policy. For more information on who or which entities are eligible applicants, refer to Part 4.

F.2. Subapplicants/Subrecipients

The subapplicant is a state-level agency, local government, federally recognized tribe or other eligible entity that submits a subapplication for FEMA assistance to the applicant.[47] If HMA is awarded, the subapplicant becomes the subrecipient and is responsible for managing the subaward and complying with program requirements and other applicable federal, state, local, tribal or territorial laws and regulations.

In most cases, subapplicants are required to have a FEMA-approved local or tribal mitigation plan that has been adopted by the jurisdiction in accordance with 44 CFR Part 201 and applicable mitigation planning policies (local or tribal) to be eligible for HMA. Engagement in mitigation planning enhances the identification of community-driven solutions, refines discussions of alternative issues, and reduces ambiguity in applications. Extensive participation of stakeholders during the creation of a mitigation plan generally results in more robust and fully refined selection of mitigation activities.

For additional information on who or which entity can be a subapplicant, refer to Part 4. For additional information on mitigation planning requirements, refer to the FEMA Mitigation Planning "Regulations and Guidance" webpage.

[45] 2 CFR § 200.1
[46] 2 CFR § 200.1 and 2 CFR § 200.332
[47] 2 CFR § 200.1

F.3. Federally Recognized Tribes

For purposes of HMGP, HMGP Post Fire, BRIC and FMA, federally recognized tribes may apply to FEMA directly as an applicant, or they may apply as a subapplicant through their state or territory.[48]

For the purposes of HMGP assistance, federally recognized tribes may obtain their own disaster declaration consistent with Section 401 of the Stafford Act.[49] Federally recognized tribes can also be recipients under a state's declaration. If they choose to become a recipient under the state's disaster declaration, they must do so before the application period closes. In this case, the assistance will be apportioned based on the damage the federally recognized tribe sustained from the disaster on the tribal land. Finally, federally recognized tribes may choose to be subapplicants under a state's disaster declaration. If a state receives a declaration that includes tribal lands, the tribal government may choose to be either a subrecipient or recipient for HMGP funding.

If a federally recognized tribe is interested in requesting HMGP assistance as an applicant based on the tribe's own disaster declaration, the federally recognized tribe must submit a disaster declaration request.

Once a tribal government receives a declaration, the tribal government becomes the recipient for the administration of any assistance authorized by the President for the declared incident, which may include the HMGP.

A tribal government acting as a recipient will assume the responsibilities of a state under 44 CFR Part 206, Subpart N for the purposes of administering the award.[50] Federally recognized tribes interested in acting as a recipient must have a FEMA-approved tribal mitigation plan in accordance with 44 CFR § 201.7. However, if a federally recognized tribe with a FEMA-approved tribal mitigation plan coordinates the review of its plan with the state, the tribe also has the option to apply as a subapplicant through that state or another federally recognized tribe.

To be eligible for HMA funding, tribal applicants and subapplicants must have a FEMA-approved tribal mitigation plan that has been adopted by the tribe in accordance with 44 CFR § 201.7 and the tribal mitigation planning policy.

For more information regarding tribal declarations, refer to the FEMA "How a Disaster Gets Declared" and "Tribal Declarations Pilot Guidance" webpages.

[48] Section 102 of the Stafford Act, 42 United States Code (U.S.C.) § 5122(6) and 44 CFR § 77.2(f)
[49] 42 U.S.C. § 5170
[50] 44 CFR § 206.431

Hazard Mitigation Assistance Programs Resources

- How a Disaster Gets Declared: https://www.fema.gov/disasters/how-declared
- Tribal Declarations Pilot Guidance: https://www.fema.gov/disasters/tribal-declarations
- Mitigation Planning Regulations and Guidance: https://www.fema.gov/emergency-managers/risk-management/hazard-mitigation-planning/regulations-guidance
- Create a Hazard Mitigation Plan: https://www.fema.gov/emergency-managers/risk-management/hazard-mitigation-planning/create-hazard-plan
- HMGP: https://www.fema.gov/grants/mitigation/hazard-mitigation
- HMGP Post Fire: https://www.fema.gov/grants/mitigation/post-fire
- BRIC: https://www.fema.gov/grants/mitigation/building-resilient-infrastructure-communities
- FMA: https://www.fema.gov/grants/mitigation/floods
- NFIP Community Status Book: https://www.fema.gov/flood-insurance/work-with-nfip/community-status-book

Part 3. Subapplication Considerations and Scoping

A. Overview

The Federal Emergency Management Agency (FEMA) encourages applicants and subapplicants to comprehensively evaluate actionable strategies to reduce vulnerabilities for the whole community as part of the state, local, tribal and territorial mitigation planning process. Applicants and subapplicants should identify all hazards, determine the risks and assess the vulnerabilities that threaten their jurisdictions to fully develop comprehensive hazard mitigation strategies. This section describes the steps to develop a successful mitigation subapplication.

A.1. Hazard Mitigation Assistance Subapplication Development Process

Every Hazard Mitigation Assistance (HMA) subapplication—whether it be for management costs, mitigation planning, project scoping or a mitigation project—goes through various phases before the subapplication is selected and awarded.

The first steps in the subapplication development process generally present the best opportunity to develop viable activities to ensure subapplications can be successful. A subapplicant and an applicant may consider community needs, eligibility requirements, availability of project scoping/advance assistance or technical assistance and the requirements of later phases, such as project implementation, monitoring and closeout.

Other key considerations should include equity for underserved communities, anticipated impacts of climate change, Environmental and Historic Preservation (EHP) and any other resilience topics relevant to the HMA application.

Determining the best mitigation or resilience activity at the earliest point in the decision-making process increases the efficacy of the overall HMA program by expediting FEMA review and by reducing the need for Requests for Information. Reducing Requests for Information may result in quicker approval of the subaward.

The HMA subapplication development process comprises the following steps:

1. Select a mitigation activity.
2. Conduct scoping.
3. Determine funding strategy and consider eligibility requirements as well as other considerations.
4. Develop the subapplication.

Eligibility and other requirements are discussed in more detail in Part 4.

The steps following subapplication development, including review and implementation phases, are described throughout the HMA Guide. Figure 2 outlines the HMA process.

Figure 2. HMA Grant Process

B. Select a Mitigation Activity

The first step in the HMA process involves selecting potential activities based on the current community needs. Selecting a mitigation activity is the link between the jurisdiction's mitigation plan and scoping, by allowing the applicant and subapplicant to select the most appropriate mitigation activity that best addresses the vulnerabilities associated with identified hazard risk(s) while considering current priorities, climate change and resilience. Activities could include capability- and capacity-building activities, such as mitigation planning and project scoping, or mitigation projects.

More information about eligible activities is in Part 4. Proposed hazard mitigation activities funded by HMA are expected to be consistent with the jurisdiction's mitigation plan, which is reviewed and updated every five years and sets long-term priorities. If selected activities are not consistent or in conformance with the mitigation plan, jurisdictions can review and update the plan and its priorities according to mitigation planning policy.

The priorities outlined in the hazard mitigation plan are prioritized actions to mitigate natural threats in the jurisdiction. Selecting a mitigation activity involves identifying what activities can be accomplished in a specific year or award cycle. Contacting the applicant's hazard mitigation officer or designated representative can be helpful in choosing which activities best fit the applicant's priorities for that year or award cycle.

C. Conduct Scoping

Scoping can significantly impact the course an application or subapplication takes through the HMA process. Scoping is the process by which subapplicants evaluate and select a preferred mitigation alternative and develop a detailed outline of all aspects of the activity, including goals, all related activities, resources, timelines and deliverables, as well as the activity's boundaries.

The scoping process may include, depending on the activity type, an evaluation of technical feasibility, cost review, cost-effectiveness, as well as EHP or cultural resource considerations of the mitigation alternatives. Other considerations may include climate change impacts and racial equity. The scoping process results in the development of a preferred activity alternative that is then documented through the preparation of the application or subapplication.

Eligible applicants and subapplicants that actively participate in and document the scoping process put themselves in a greater position for success during subapplication development. The information gathered in the scoping process serves as the basis for the development of a more detailed and robust scope of work, budget and EHP compliance components of the mitigation activity.

During the scoping process, the applicant and subapplicant may encounter considerations such as technical feasibility, cost-effectiveness and EHP requirements that necessitate the refinement or adjustment of the mitigation activity. In these situations, the reason for the refinement or re-scoping should be fully documented and included with the subapplication. Figure 3 details considerations during each step of the scoping process.

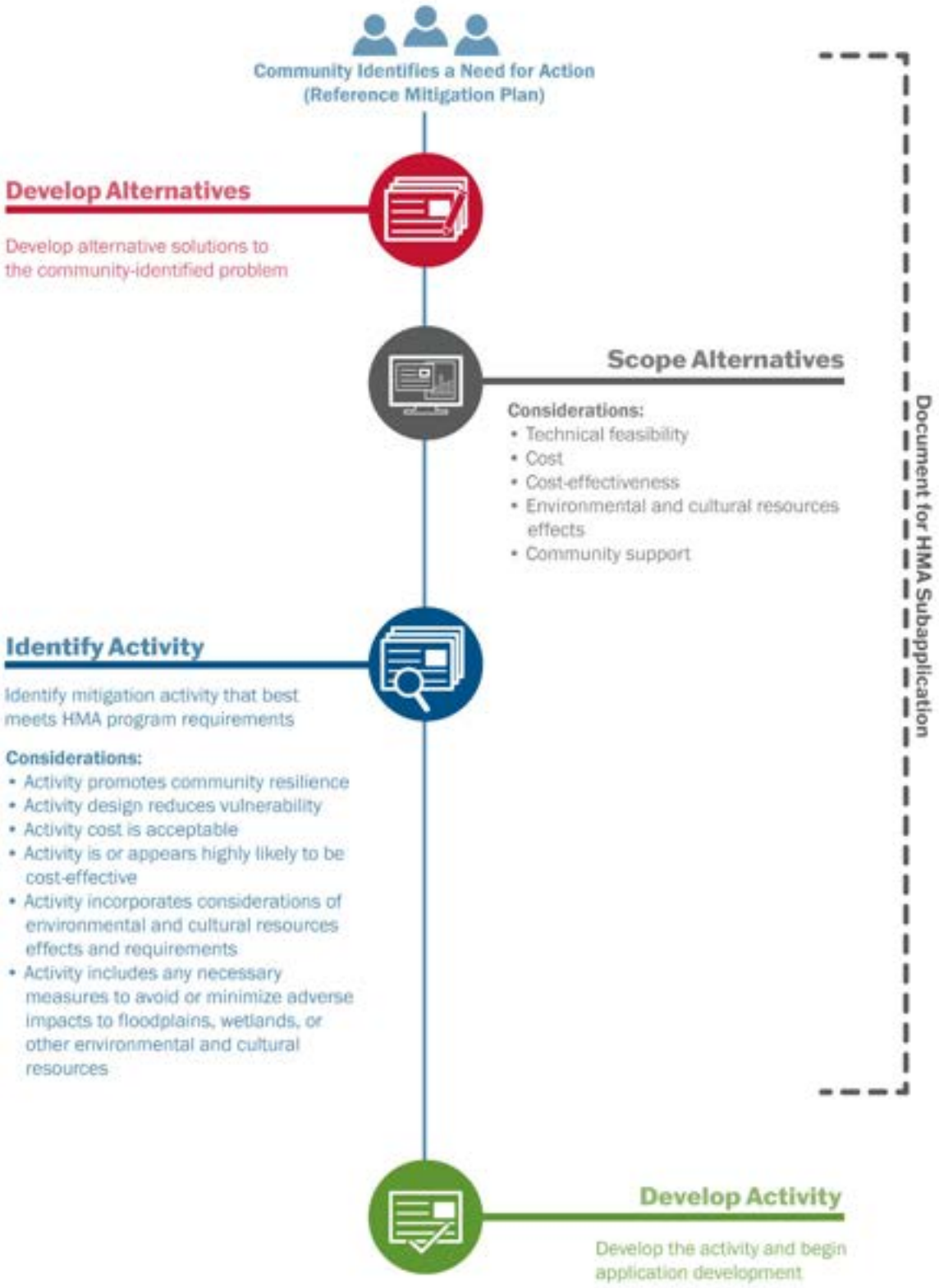

Figure 3. Scoping Process

Applicants and subapplicants should consider the whole range of program requirements at the beginning stages of activity scoping. Addressing HMA program requirements at the earliest stage possible in the decision-making process is important because it can lead to enhanced project scoping and development as well as prevent delays later in the subaward lifecycle.

The HMA program requirements comprise the following topics:

- Hazard mitigation plan requirements.
- Technical feasibility and effectiveness.
- Floodplain management and protection of wetlands.
- EHP review and compliance.
- Cost-effectiveness.
- Cost review.

For specific information on scoping local hazard mitigation plans, refer to the *Considerations for Local Mitigation Planning Grant Subapplications* FEMA job aid (March 2021). For specific information on scoping tribal hazard mitigation plans, refer to the *Tribal Mitigation Planning and HMA Grant Application Development* FEMA job aid (March 2021).

D. Determine Funding Strategies and Eligibility Requirements

HMA programs offer options to assist applicants and subapplicants during the project scoping and development process. The programs may also help applicants and subapplicants identify opportunities to include mitigation in Public Assistance (PA) projects and other recovery activities.

D.1. Project Scoping/Advance Assistance

Applicants and subapplicants may use HMA for project scoping/advance assistance activities. Eligible activities include the development of mitigation strategies, cost-share strategies and data gathering (including for EHP compliance considerations) to prioritize, select and develop complete and timely HMA applications. Project scoping/advance assistance activities can help applicants and subapplicants develop eligible and complete applications that include a feasible project budget and appropriate project milestones.

Under HMGP and HMGP Post Fire, project scoping/advance assistance allows an advance of up to 25% of the HMGP ceiling or HMGP Post Fire available assistance amount, or $10 million (whichever

is less), to applicants/subapplicants to accelerate the implementation of HMGP or HMGP Post Fire.[51] While eligible activities for project scoping/advance assistance are limited to those described here, post-disaster activities and projects that need to begin early in the recovery process can be submitted to FEMA under HMGP and HMGP Post Fire as part of the 30-day or six-month assistance increment request. Refer to Part 10 for additional information.

Project scoping eligibility for Building Resilient Infrastructure and Communities (BRIC) and Flood Mitigation Assistance (FMA) may be found in each program's respective Notice of Funding Opportunity (NOFO).

For more information regarding project scoping/advance assistance, refer to Part 11.

D.2. Management Costs

FEMA provides assistance under HMGP, HMGP Post Fire, BRIC and FMA for management costs incurred in the administration of HMA.

For HMGP and HMGP Post Fire, recipients may be reimbursed not more than 15% of the total amount of the award; not more than 10% may be used by the recipient and 5% by the subrecipient.[52] FEMA will provide 100% federal assistance for management costs based on the total amount of the award incurred up to the rates established above.

For BRIC and FMA, the amount of management costs available and the level of FEMA assistance for management costs are identified in the NOFO. If any requirements in the HMA Guide conflict with the NOFO, the requirements in the NOFO take precedence.

For additional details regarding management costs, refer to Part 10 and Part 13.

D.3. Phased Projects

Phased projects are allowable under HMGP, HMGP Post Fire, BRIC and FMA.

Phased projects are used when it is beyond the subapplicant's technical and financial resources to provide the complete technical information required for a full eligibility or EHP review of a complex project. In this instance, the subapplicant can apply for assistance to develop a complete body of technical data, which may include conducting engineering or feasibility studies, preparing a Benefit-Cost Analysis (BCA), or providing documentation for an EHP review. These products are referred to as the Phase I deliverables.

The Phase I deliverables provide FEMA with a technical body of information that is mutually agreed on by the subapplicant, the applicant and FEMA to determine project eligibility. If the results of the

[51] Section 404 of the Stafford Act, 42 United States Code (U.S.C.) § 5170c.
[52] Section 324 of the Stafford Act, 42 U.S.C. § 5165b

Phase I deliverables indicate the project meets HMGP, HMGP Post Fire, BRIC or FMA requirements, the project would then be eligible for construction assistance under a Phase II approval. Phase I assistance is part of the project's total estimated cost and is subject to HMGP, HMGP Post Fire, BRIC or FMA cost-share requirements.

The use of a phased approach should be limited to complex projects that require technical or EHP data beyond the scope of what is generally required for a typical project. Phased projects are used when a subapplicant has a preliminary plan or concept where FEMA can make an initial eligibility determination. The preliminary plan or concept provides a guideline that the subapplicant can use to develop cost estimates and final construction plans and other required analysis to determine eligibility (such as BCA and EHP) before moving forward to Phase II construction. Both Phase I and Phase II are intended to be completed within the award period of performance. FEMA may use the pre-screening process to collect data needed to determine the eligibility of the project before committing additional funding for project design.

All applicants and subapplicants must follow the requirements under the procurement regulations.[53] If applicants and subapplicants propose to use contract support for subapplication development and/or design and construction phases, they should review procurement and conflict of interest regulations to ensure they can comply with those requirements. More information about procurement can be found in Part 4.

D.3.1. PHASED PROJECT: PRE-SCREENING PROCESS TO DETERMINE ELIGIBILITY

The purpose of the pre-screening process is to ensure that the Phase I scope of work is enough to allow FEMA to review the project and determine eligibility and meet other program requirements.

The recipient must submit a subapplication, using the project specific information in Part 12, that provides all available preliminary design and site data. While a phased project may not have all the required information, the scope of work must address how any gaps will be addressed in Phase I. The applicant and subapplicant must select the appropriate project code for the Phase I deliverables within the electronic application system for proper project tracking.

The project must meet the following pre-screening criteria for a conditional Phase I approval to verify they meet the following criteria:

- **Hazard mitigation plan**: The proposed project must be in conformance with the mitigation plan.
- **Justification for selection of the proposed project**: Justification must be provided for the selection of the proposed solution after consideration of a range of options. Minimum criteria for a solution should include:

[53] 2 Code of Federal Regulations (CFR) §§ 200.317-327

- Analysis on why the selected approach was selected and at least two alternative proposals and why they were not selected.
- Performance based criteria establishing the level of protection for the long-term solution along with the anticipated remaining risk after the proposed project is complete.
- List of missing technical data to be collected and developed during Phase I, including a vulnerability assessment, engineering practices, established codes, standards, modeling techniques and best practices to which the design will conform.
- Proposed conceptual drawings or design.
- List of minimum deliverables and milestones to be completed during Phase I.

- **Scope of work**: The scope of work must identify the steps and deliverables needed to complete Phase I and preliminary actions to complete Phase II. Based on the pre-screening review, FEMA may use the Request for Information procedures to adjust the scope of work to ensure all program requirements can be addressed. The Phase II scope of work can be adjusted as part of the Phase II approval process.
- **Budget**: A detailed budget must be included in the subapplication. The estimated costs within this budget must identify all line items associated with the Phase I deliverables and an estimate for the Phase II costs. The Phase II estimate can be adjusted based on the findings of the Phase I deliverables through the budget amendment process.
- **Potential schedule and milestones**: The project demonstrates that it can likely be completed within the period of performance allowed by the program.
- **Potential cost-effectiveness**: The project must demonstrate potential cost-effectiveness based on a preliminary assessment of anticipated project benefits and cost. The subapplicant must be aware that this preliminary assessment is solely for the purpose of the Phase I pre-screening process and is not the final cost-effectiveness determination. A preliminary BCA is required at the time of subapplication. This must be based on feasible assumptions and available data regarding risk and must be determined by using the latest version of the BCA Toolkit.
- **Other relevant technical data**: The subapplicant must provide available data, including hydrologic and hydraulic data, based on existing models and other relevant technical data, as appropriate.
- **EHP review**: FEMA will complete an initial review and provide technical assistance to identify major EHP compliance issues and information needs. Additional EHP review by FEMA of the revised project design is required before Phase II approval. When a project is submitted for phased review and the Phase I scope of work is limited to developing engineering and architectural design plans, the Phase I review will likely meet a specified categorical

exclusion (CATEX), which is a type of work categorically excluded from the National Environmental Policy Act[54] review. If applicable, FEMA will document the CATEX to a proposed action in a Record of Environmental Consideration, which would record that the Phase I aligns with the scope of the specified CATEX and documents any extraordinary circumstances.[55] Also, Phase I must comply with other EHP requirements such as Section 106 of the National Historic Preservation Act,[56] Section 7 of the Endangered Species Act,[57] and Executive Order (EO) 11988 on *Floodplain Management* (May 24, 1977) as amended by EO 13690 on *Establishing a Federal Flood Risk Management Standard and a Process for Further Soliciting and Considering Stakeholder Input* (Jan. 30, 2015), among others. FEMA will provide technical assistance during the Phase I review to identify any potential EHP compliance issues, specify any information that would be needed to conduct a Phase II review, and determine what level of National Environmental Policy Act review is applicable to the action.[58] Applicants must address EHP requirements before construction can be funded. It is important for applicants to identify all data needs during the pre-screening process and update the Phase I scope of work to ensure they are completed.

If required, FEMA will use the Request for Information procedures to request adjustments to the subapplication Phase I scope of work, schedule and budget so that it includes all required elements to complete Phase I.

D.3.2. PHASE I: CONDITIONAL APPROVAL

The applicant and FEMA may approve projects meeting the above pre-screening requirements for technical assistance under a Phase I conditional approval. FEMA and the applicant must coordinate closely to ensure mutual concurrence on all data and technical information as the Phase I technical review process proceeds. The sequence for the process is as follows:

- **Other relevant technical data**: If appropriate, the applicant and FEMA review the hydrologic and hydraulic or other technical data provided by the subapplicant.
- **Preliminary engineering design**: Based on the technical data, the subapplicant develops a preliminary engineering and design layout and budget with project-specific technical assistance from the applicant and FEMA.
- **Compliance with EO 11988 as amended by EO 13690**: If applicable, based on the technical data and revised engineering design, the subapplicant must demonstrate the project's compliance with floodplain management requirements under EO 11988 on *Floodplain Management* (May 24, 1977), as amended by EO 13690 on *Establishing a Federal Flood*

[54] Public Law 91-190 (Jan. 1, 1970)
[55] If warranted by the extraordinary circumstances analysis, FEMA will conduct an Environmental Assessment.
[56] Public Law 89-665 (Oct. 15, 1966), as amended; 36 CFR Part 800
[57] Public Law 93-205 (Dec. 28, 1973), as amended; 16 U.S.C. § 1531
[58] Public Law 91-190 (Jan. 1, 1970), 42 U.S.C. § 4321

Risk Management Standard and a Process for Further Soliciting and Considering Stakeholder Input (Jan. 30, 2015). If a Flood Insurance Rate Map amendment or revision is necessary, the applicant and FEMA will provide the subapplicant with technical assistance to meet this requirement.

- **Refinement of the cost-effectiveness assessment**: Based on the revised design, budget and calculations made by the BCA Toolkit, the applicant and FEMA must refine the preliminary assessment of cost-effectiveness conducted prior to Phase I approval. This will result in a final benefit cost ratio to evaluate the project's cost-effectiveness, which must include all the project costs, including Phase I. The BCA, developed through the BCA Toolkit, should be supported by available information including:
  - Risk information supporting the pre-mitigation losses (e.g., Flood Insurance Rate Maps/Flood Insurance Study, loss history, structural risk assessments).
  - Mitigation effectiveness information supporting the risk reduction (e.g., commitment to a design standard,[59] level of protection [1% annual chance recurrence interval]).
  - Cost estimate for the anticipated project cost (including design costs) along with supporting assumptions.
- **Key assumptions**: The applicant describes the key assumptions, along with justification or rationale for these assumptions, regarding risk, project effectiveness and cost.
- **EHP review**: The applicant and FEMA must conduct a review of the revised project design to ensure EHP compliance. The project must meet EHP requirements before Phase II is approved.

After Phase I work has been completed and submitted to FEMA, FEMA will review the data to determine if the project remains eligible to move forward to Phase II. If the project does not meet eligibility requirements, FEMA will notify the recipient and proceed with closing out the subaward. Phase II funding will not be obligated.

If after reviewing the Phase I data, the recipient and subrecipient decide they do not want to complete Phase II, they must submit a change in budget request justifying their request to withdraw the project so they can closeout the award. For more information regarding budget and scope of work changes, refer to Part 8.F.

[59] Such as American Society of Civil Engineers Standard 24, *Flood Resistant Design and Construction* (2015) or FEMA P-361, *Safe Rooms for Tornadoes and Hurricanes* (April 2021).

D.3.3. PHASE II: APPROVAL – CONSTRUCTION PROCESS

If FEMA determines the project to be eligible, technically feasible, cost-effective and compliant with EHP requirements under the Phase I technical review, FEMA may then approve the project for construction under Phase II.

D.4. Pre-Award Costs

Pre-award costs directly related to developing a subapplication that are incurred prior to the date of the grant award are allowed, subject to FEMA approval at the time of the award. Pre-award costs may be incurred, for example, when gathering National Environmental Policy Act data or developing a BCA, preparing design specifications, or when holding workshops or meetings related to reviewing proposed alternatives and designs. Pre-award costs are allowable only to the extent that they would have been allowable if incurred after the date of the federal award.[60]

Pre-award costs may be cost shared or applicants and subapplicants may identify them as their non-federal cost share. For more information on cost share requirements, refer to Part 4.

In general, pre-award costs are eligible for activities that involve no commitment of resources other than staffing and associated funding. Costs for activities, such as ground disturbance or construction, or activities that would affect historic properties and/or threatened and endangered species and that are initiated or completed outside of the application period and period of performance are not eligible. In addition, any ground disturbance or construction activity completed before FEMA approval is not allowed and therefore their associated costs are not eligible. Projects initiated or completed prior to the federal award or full approval of the project are not eligible.[61]

Activities directly related to the project, including management costs and project costs, may be eligible for pre-award costs. Any pre-award costs designated as management costs count toward the 5% limit for subrecipient management costs. Eligible management costs activities may include developing the application or subapplication, preparing the BCA, and gathering EHP data. For more on management costs, refer to Part 13.

To be eligible for HMA, pre-award costs must be identified as separate line items in the budget of the subapplication and cannot have been funded by another project, award or program. Applicants and subapplicants who are not selected for awards or subawards will not receive reimbursement for the corresponding pre-award costs.

For HMGP and HMGP Post Fire, eligible pre-award costs are those incurred after the date when HMGP is authorized, which is generally the date of the major disaster declaration.[62]

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[60] 2 CFR § 200.458

[61] For HMGP, refer to 44 CFR § 206.434(d)(2) and 44 CFR § 206.439(c); for FMA, refer to 44 CFR § 77.7(b); for BRIC, refer to the relevant NOFO.

[62] 2 CFR § 206.439

For BRIC and FMA, the period of eligibility for pre-award costs is addressed in the NOFO.

E. HMGP and Public Assistance

During the activity development phase, applicants and subapplicants should consider two types of FEMA mitigation assistance available post-disaster: HMGP assistance under Section 404 of the Stafford Act (including HMGP Post-Fire) and PA under Section 406 of the Stafford Act. PA is available to fund mitigation of disaster-damaged facilities and for post-disaster code enforcement activities.

HMGP and PA are two distinct assistance sources but can sometimes be used together to more completely fund a hazard mitigation project and promote resilience. While applicants and subapplicants have the discretion to apply for PA or HMGP (while the HMGP application period is open), FEMA encourages applicants and subapplicants to maximize assistance from PA.

If a subapplicant is seeking both HMGP and PA, HMGP subapplications still must meet HMGP program requirements, including submission in accordance with HMGP program timelines, consistency with hazard mitigation plans, and approval by the hazard mitigation officer or designated representative. Evaluating opportunities to leverage HMGP and PA can facilitate project scoping and development. Additionally, exploring these opportunities can maximize the use of PA Mitigation for disaster-damaged facilities while preserving limited HMGP assistance for use on other activities. If HMGP and PA are considered to fund a mitigation activity, applicants and subapplicants should also assess potential duplication of benefits issues. For more on duplication of benefits, refer to Part 4.

E.1. Public Assistance Mitigation

Under Section 406 of the Stafford Act, FEMA has the authority to provide funding for cost-effective hazard mitigation measures for disaster-damaged facilities. FEMA refers to PA-funded hazard mitigation as PA Mitigation. To be eligible for PA Mitigation, the mitigation measures must reduce future damage to the facility, as well as be cost-effective, technically feasible and compliant with EHP requirements. Generally, PA-eligible mitigation measures are intended to protect the damaged portion(s) of the facility. If the applicant proposes mitigation measures that are distinct and separate from the damaged portion(s) of the facility, FEMA evaluates the proposal and determines eligibility on a case-by-case basis. FEMA considers how the mitigation measure protects the damaged portion(s) of the facility and whether the mitigation measure is reasonable based on the extent of the damage.

Applicants may use both PA Mitigation and HMGP assistance to implement mitigation measures at the same facility but not for the same work. Applicants cannot use assistance from one of these mitigation programs to meet the non-federal cost share of work funded under the other mitigation program. A combination of PA and HMGP assistance may be appropriate where PA Mitigation is used to provide protection to portions of a facility that were damaged by a declared disaster and HMGP assistance is used to protect undamaged portions of the facility or a nearby, undamaged facility (refer to examples in callout box).

FEMA Policy #104-009-2, *Public Assistance Program and Policy Guide, Version 4* (June 1, 2020), provides further details on PA Mitigation.

Examples of HMGP and PA Mitigation

The following project examples illustrate how an applicant or subapplicant can use both HMGP and PA mitigation to maximize the protection of a facility or facilities from future damage:

- A school damaged by wind can be repaired and mitigated with shutters or impact-protective glazing using PA assistance and enhanced with an HMGP-assisted safe room.
- Damaged portions of a building in a seismic risk zone damaged by flooding can be repaired and mitigated with dry floodproofing and seismic upgrades using PA Mitigation. On a case-by-case basis, PA Mitigation funding may also be available for the undamaged portions of the facility. If the undamaged portions of the facility are not eligible for PA Mitigation, HMGP funds may be used to protect those undamaged portions of the building from flood and seismic hazards.
- While a road damaged by a landslide is being repaired and mitigated using PA, HMGP assistance can be used to bury undamaged aboveground power lines running along the road.

E.2. Post-Disaster Code Enforcement

In addition to mitigating damage to a facility, PA and HMGP can be used for post-disaster building code enforcement. As part of PA, FEMA is authorized to provide assistance to state and local governments for building code and floodplain administration and enforcement, including inspections for substantial damage compliance, for a period of not more than 180 days after the major disaster is declared. More information can be found in FEMA Policy #204-079-01, *Building Code and Floodplain Management Administration and Enforcement* (Oct. 15, 2020).

HMGP can also provide assistance for post-disaster building code activities during recovery and to continue past the 180-day PA limit if needed. If a recipient or subrecipient receives PA for building code enforcement and administration activities and intends to continue these activities after PA is no longer available, they should submit a subapplication under HMGP as soon as possible. This way, the subapplication can be reviewed and approved before the 180-day PA limit expires.

HMGP and HMGP Post Fire post-disaster code enforcement projects are eligible to cover extraordinary post-disaster code enforcement costs that ensure disaster-resistant codes are implemented during disaster reconstruction after normal costs of the building department are deducted. For more information, refer to Part 11.

In addition to HMGP post-disaster code enforcement projects, building code activities may be funded under the 5 Percent Initiative and the 5 Percent Codes and Standards. For more on codes and standards, including eligibility and assistance restrictions, refer to Part 11.

F. Cost Review

Conducting a cost review at the earliest possible stage allows for improved activity scoping and development and facilitates FEMA's review. All costs included in the subapplication should be reviewed to ensure they are necessary, reasonable and allocable along with being consistent with the provisions of 2 Code of Federal Regulations (CFR) §§ 200.402 – 411.

G. Cost-Effectiveness

By statute and regulations, mitigation activities under HMGP, HMGP Post Fire, BRIC and FMA must be cost-effective; specific requirements for each program can be found in Part 10. FEMA generally assesses the cost-effectiveness of hazard mitigation projects through a BCA—a quantitative analysis used to assess the cost-effectiveness of a hazard mitigation measure by comparing the project's avoided future damage to the costs over the project lifetime. Considering cost-effectiveness at the earliest possible stage of the decision-making process can facilitate project scoping and improve project design. For more information on cost-effectiveness, refer to Part 5.

H. Technical Feasibility and Effectiveness

Mitigation projects submitted to HMA programs must be both feasible and effective at mitigating the risks of the hazard for which the projects are designed. The feasibility of a project is demonstrated through conformance with accepted engineering practices, established codes, standards, modeling techniques or best practices.

Effective mitigation measures funded under HMA should provide a long-term or permanent solution and should consider changing climate and weather conditions, development, settlement and demographic patterns, as appropriate. Considering technical feasibility and effectiveness during the scoping process facilitates project development.

For specific feasibility and effectiveness requirements by project type, refer to Part 12.

I. Environmental and Historic Preservation Review and Compliance

Subapplicants can leverage EHP requirements in the scoping process to develop resilient mitigation projects and avoid, minimize and mitigate any adverse effects of mitigation projects on natural and cultural resources and on minority and low-income populations and tribes. All projects proposed for FEMA funding must comply with EHP laws, regulations and executive orders. The National Environmental Policy Act requires FEMA and other federal agencies to assess the environmental impacts of proposed federal actions prior to making decisions or funding projects. Like the National

Environmental Policy Act, Section 106 of the National Historic Preservation Act requires federal agencies to consider the effect of their actions on historic properties.[63]

FEMA must also ensure a proposed project is compliant with other federal laws, regulations, and executive orders such as the Federal Water Pollution Control Act (Clean Water Act);[64] the Endangered Species Act of 1973;[65] and EO 11988, as amended by EO 13690 and EO 11990 on the *Protection of Wetlands* (May 24, 1977). EO 12898 on *Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations* (Feb. 11, 1994) requires federal agencies to consider disproportionately high and adverse effects on minority and low-income communities related to federal programs, policies and activities. Environmental justice is considered during the National Environmental Policy Act process, when individual projects are reviewed or programmatic actions are considered. Furthermore, EO 13985 on *Advancing Racial Equity and Support for Underserved Communities Through the Federal Government* (Jan. 20, 2021) requires the federal government to pursue a comprehensive approach to advancing equity for all, including people of color and others who have been historically underserved, marginalized and adversely affected by persistent poverty and inequality.

Many EHP laws, regulations and executive orders require a decision-making process to consider alternatives and impacts to resources during project scoping. Early consideration of EHP resources in the project scoping phase will allow communities to design projects that avoid, minimize and mitigate adverse impacts of projects to natural and cultural resources as well as minority and low-income populations and tribes.

For example, some key EHP considerations include:

- Whether the proposed project is in an area with threatened and endangered species or in the threatened and endangered species' designated critical habitat.
- Whether the proposed project might impact historic or cultural resources.
- Whether the proposed project will have a disproportionate impact on low-income and minority populations or tribes.
- Whether the proposed project will involve work in water, floodplains, wetlands or coastal zones.

If the project could result in adverse impacts to natural and cultural resources or have disproportionately high and adverse impacts on low-income and minority populations or tribes, then EHP laws, regulations or executive orders may:

[63] 36 CFR Part 800; Public Law 89-665 (Oct. 15, 1966), 16 U.S.C. § 470
[64] Public Law 92-500 (Oct. 18, 1972), 33 U.S.C. § 1251 et seq.
[65] Public Law 93–205 (Dec. 27, 1973), 16 U.S.C. § 1351 et seq.

- Have time and cost implications for a project.
- Include additional award conditions (such as permits or timing restrictions) imposed by FEMA.
- Require the applicant or subapplicant to consider alternatives, identify alternate locations, and, as necessary, modify the project.
- Require mitigation measures to resolve adverse effects or impacts resulting from the project.

By considering natural and cultural resources in the project scoping phase, applicants and subapplicants may be able to resolve issues of concern earlier in the process, prior to significant commitment of time and resources. Refer to Part 4 for an overview of incorporating the EHP and the National Environmental Policy Act process in project scoping.

Early consideration of natural and cultural resources in the project scoping process can also help develop resilient mitigation projects and advance environmental stewardship in communities. Applicants and subapplicants should consider those resources to identify opportunities for the design of projects to enhance, restore or preserve natural and cultural resources and to provide additional ecosystem services to a community. This approach can lead to better mitigation outcomes. For example, mitigation project types that create open space, such as property acquisitions and innovative drought and flood mitigation activities, can provide conservation benefits to species and habitats. Early consideration of cultural resources can help identify mitigation approaches that preserve historical resources from hazards without adversely affecting their historic, aesthetic or cultural value.

During project scoping, applicants and subapplicants should research prior activities close to the proposed project location, such as identifying EHP reviews undertaken by federal, state or local commissions or agencies for previously completed projects, gathering EHP data, and reaching out to stakeholders and regulatory agencies for pertinent information. Applicants and subapplicants should use the EHP Checklist (refer to Table 7) and the FEMA "Environmental & Historic Preservation Grant Preparation Resources" webpage to help identify EHP issues and consider natural and cultural resources when scoping a project and developing a project application. Advance assistance, pre-award costs, phasing assistance and technical assistance are available mechanisms to consider the EHP requirements in the early stages. For more information, refer to Part 6.

To help applicants and subapplicants develop project scopes, federal and state regulatory agencies may offer pre-application consultation meetings to provide informal discussions about proposed activities, alternatives and measures for reducing impacts. These agencies may include but are not limited to the U.S. Fish and Wildlife Service and the National Marine Fisheries Service for impacts to federally listed threatened and endangered species; U.S. Fish and Wildlife Service for impacts to Coastal Barrier Resource System zones and bald or golden eagles; National Marine Fisheries Service for impacts to essential fish habitat or marine mammals; and the U.S. Army Corps of Engineers (USACE) for projects in navigable waters or that involve dredging or filling in waters of the United

States. State and tribal agencies may include the departments of environmental protection, historic preservation offices, and local floodplain administrators.

Public engagement is an integral part of EHP reviews and project development and is required for compliance with many EHP laws, regulations and executive orders. Public input can help identify potential impacts to natural and cultural resources, low-income and minority communities, and tribes. Public input can also help shape project scopes to provide better mitigation outcomes.

Subapplicants may assist FEMA in planning public engagement strategies and with publishing public notices on community websites, in newspapers or on social media. In their subapplications, subapplicants should describe any existing or planned public engagement activities and feedback received from the public regarding the project.

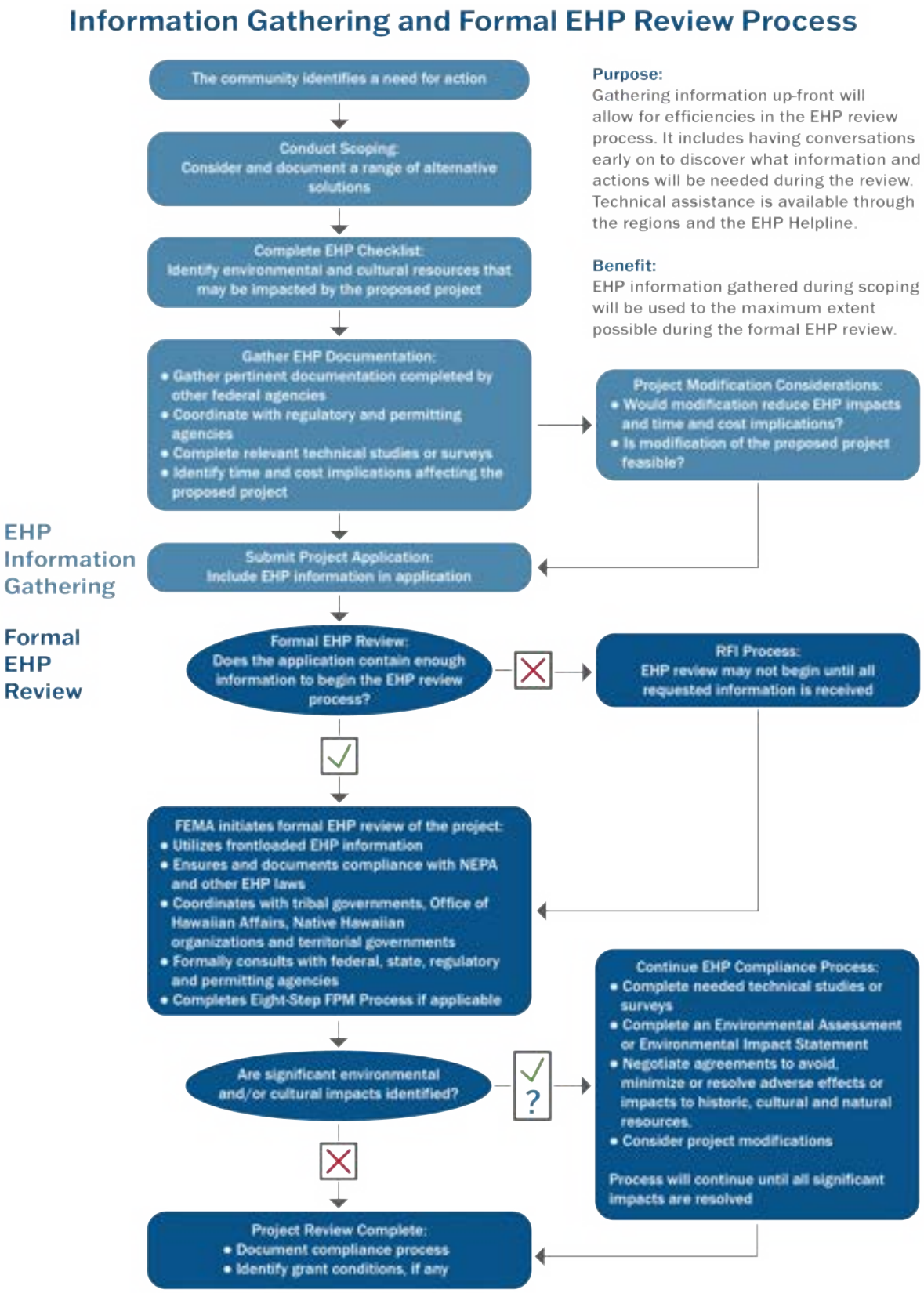


Figure 4. EHP Information Gathering and the Formal Review Process

J. Unified Federal Review

In some cases, HMA may approve funding for a portion of a larger project that involves other FEMA programs (e.g., PA, Individual Assistance [IA]); other federal agencies (e.g., USACE); or agencies with delegated federal authority (e.g., the Department of Housing and Urban Development).

In these cases, the Sandy Recovery Improvement Act of 2013[66] added Section 429 to the Stafford Act,[67] which directed the development of an expedited and unified interagency EHP review process, also known as Unified Federal Review, to ensure federal agencies coordinate EHP compliance for activities. When two or more federal agencies are involved with a project, or if any applicant EHP coordination has occurred, relevant environmental and historic or cultural resource considerations may have already been identified and addressed in previous EHP project planning activities. FEMA may be able to use or adopt EHP documentation if that documentation addresses the scope of the FEMA-approved activity, and the agency verifies it meets EHP compliance requirements.

Projects proposed for FEMA funding may involve more than one federal agency and can require significant interagency collaboration and stakeholder engagement. Federal agencies use the Unified Federal Review process to address the coordination challenges when multiple agencies are engaged in the same disaster recovery effort. The Unified Federal Review process recognizes the important role of federal agencies, states, tribes, localities and the public in EHP reviews. Applicants and subapplicants should identify for FEMA the other federal agency or agencies from which they are seeking approval, funding or permitting, as well as provide any relevant information to help streamline and inform the EHP review.

The Unified Federal Review process coordinates federal agency EHP reviews for proposed projects associated with Presidentially declared disasters under the Stafford Act. The purpose of the Unified Federal Review process is to improve federal decision-making to allow for more timely and planned processes that yield better outcomes for communities and the environment when federal funds and permits are used for disaster recovery projects. The Unified Federal Review process does not change EHP requirements under existing federal law. Instead, it identifies ways to use existing efficiencies, with new tools and mechanisms, to expedite the EHP review of proposed projects involving multiple federal agencies and avoid duplication of effort.

These efforts include identifying and addressing gaps and inconsistencies within federal regulations, policies and programs related to natural and cultural resource issues, which result in the following outcomes:

- Faster delivery of federal assistance to rebuild following a disaster.

[66] Public Law 113-2 (Jan. 29, 2013), 42 U.S.C. § 5121
[67] 42 U.S.C. § 5189g

- Transparent EHP review process for disaster recovery projects and what may be required before a federal agency may award assistance.
- Streamlined application processes for federal assistance, in which federal agencies accept data in multiple formats so duplicate EHP information is no longer needed.
- Up-to-date contact information for federal and state agencies that can provide federal assistance and relevant information.

The Unified Federal Review process may assist a jurisdiction's project review if any of the following statements is true:

- Other federal resource/regulatory agencies are involved.[68]
- Other federal funding or actions are involved.
- The proposed project is covered by existing analyses or agreements.

To learn more about the Unified Federal Review process and how it may apply to a project, consult the Practitioner's Guide to Unified Federal Review contact the Regional Unified Federal Review Coordinator or send an email to federal-unified-review@fema.dhs.gov.

K. Floodplain Management and Protection of Wetlands

HMA programs and awards must conform to 44 CFR Part 9, which incorporates the requirements of EO 11988, as amended by EO 13690 and EO 11990. Applicants and subapplicants must review all proposed actions to determine whether they are in the floodplain or wetland. In accordance with EO 11988, as amended, and EO 11990, FEMA must complete an eight-step decision-making process for proposed actions located in the 1% annual chance floodplain (or 0.2% annual chance floodplain for critical actions) and proposed actions that have the potential to affect or be affected by a floodplain or wetland (refer to Figure 5).

As part of the eight-step decision-making process, FEMA must consider alternative locations to determine whether the floodplain or wetland is the only practicable location for that action. Applicants and subapplicants must document alternatives considered as part of their scoping process to assist FEMA in facilitating this decision-making process. If the floodplain or wetland is the only practicable location, the applicant/subapplicant must avoid or must minimize adverse impacts to the floodplain or wetland. For more information on floodplain management requirements, refer to Part 4.

[68] Other federal resources and regulatory agencies may be found in the multiagency *Memorandum of Understanding Establishing the Unified Federal Environmental and Historic Preservation Review Process for Disaster Recovery Projects* (2014).

L. Accessibility

FEMA is committed to achieving accessible and fully inclusive emergency management. Considerations for individuals with disabilities should be contemplated as part of holistic community-based mitigation. With respect to HMA, this requires active engagement in meeting access and functional needs of people with disabilities as applications are scoped and developed. FEMA and recipients of HMA must comply with any federal law addressing accessibility, as applicable, such as the Americans with Disabilities Act of 1990,[69] Architectural Barriers Act of 1968 (ABA) [70] or the Rehabilitation Act of 1973.[71] This document generally refers to the ADA regarding accessibility requirements but HMA recipients should be aware that the ABA and Rehabilitation Act may also apply. As appropriate, factors for accessible design should be incorporated into HMA activities to serve the whole community to the greatest extent possible. When communities integrate the access and functional needs of the Whole Community in all phases of community-wide emergency management, they strengthen their ability to prepare for, protect against, respond to, recover from and mitigate all hazards.

For more on accessibility, refer to the FEMA Section 504 of the Rehabilitation Act of 1973 Overview.

M. Develop the HMA Subapplication

The next step in the HMA process is developing or assembling the subapplication. The principal components of a subapplication are the scope of work, budget and schedule. These pieces may be developed based on previous similar activities by the subapplicant through construction estimates, property appraisals and other technical evaluations.

Once the subapplicant prepares the subapplication, it is submitted to the applicant. Once the subapplications are collected, the applicant reviews and prioritizes submissions based on specific criteria that align with its mitigation strategy with regard to available funding and activity type.

Finally, the application is submitted to FEMA for determination of eligibility based on cost-effectiveness, technical feasibility, EHP review and the approved mitigation plan as applicable to activity type. FEMA may send the applicant a Request for Information. A Request for Information is often used to help clarify and strengthen the subapplication. For more information on the Request for Information process, refer to Part 6.

Applications and subapplications submitted to FEMA must meet all program eligibility criteria outlined in the law, regulation and HMA Guide. FEMA does not accept incomplete or placeholder applications or subapplications. Incomplete applications or subapplications delay award and

[69] Public Law 101-336 (July 26, 1990),
[70] Public Law 90-480 (Aug. 12, 1968), 42 U.S.C. § 4151
[71] Public Law 93-112 (Sep. 26, 1973), 42 U.S.C. § 701

subaward approval if they do not contain sufficient information for FEMA to make a program eligibility determination.

If an application lacks the necessary eligibility information, FEMA cannot determine eligibility and approve an application.

The following documentation, which is needed to demonstrate eligibility, should be contained in the subapplication and application. Criteria may vary depending on the proposed activity, but applications/subapplications generally include all the elements below:

- Eligible applicant and subapplicant.
- Identification of mitigation activity.
- Alternate mitigation actions.
- Conformance with FEMA-approved mitigation plan.[72]
- Scoping narrative that provides an outline of the proposed activities and outcomes and contains the following:
  - Detailed scope of work.
  - Work schedule demonstrating that the activity will be completed within the period of performance for the applicable program (refer to Part 8.G).
  - Budget that supports the scope of work, including the schedule, and reflects the total activity cost.
  - Cost share information that clearly identifies the source of the non-federal cost share and establishes that the non-federal cost share meets program eligibility requirements.
  - Cost-effectiveness information (refer to exceptions in Part 5).
  - Feasibility and effectiveness information (mitigation project types only).
  - EHP compliance documentation as required by EHP guidance (refer to Table 7 for EHP Compliance Checklist).
- Assurances and approved forms in accordance with programming requirements (refer to Part 6 and Part 10).
- Additional documentation as required by FEMA.

[72] For HMGP, refer to 44 CFR § 206.434(c)(1); for FMA, refer to 44 CFR § 77.6(b); for BRIC, refer to the NOFO.

Subapplication requirements and the Environmental and Historic Preservation Checklist have been incorporated into FEMA's electronic application system. For additional information on the above outlined elements of the subapplication, refer to Part 6.

Subapplication and Scoping Resources

- *Considerations for Local Mitigation Planning Grant Subapplications* FEMA job aid: https://www.fema.gov/sites/default/files/documents/fema_hma-considerations-local-planning-grant-job-aid.pdf
- *Tribal Mitigation Planning and HMA Grant Application Development* FEMA job aid: https://www.fema.gov/sites/default/files/documents/fema_hma-tribal-job-aid.pdf
- Public Assistance program policy, guidance and fact sheets: https://www.fema.gov/assistance/public/policy-guidance-fact-sheets
- FEMA Policy 204-079-01, *Building Code and Floodplain Management Administration and Enforcement*: https://www.fema.gov/sites/default/files/2020-10/fema_building-dode-floodplain-management-ddministration-enforcement-policy_drra-1206_signed_10-15-2020.pdf
- National Environmental Policy Act: https://www.epa.gov/nepa
- EHP Guidance for FEMA Grant Applications: https://www.fema.gov/grants/guidance-tools/environmental-historic
- FEMA Section 504 of the Rehabilitation Act of 1973 Overview: https://www.fema.gov/about/offices/equal-rights/504
- Americans with Disabilities Act Title II Regulations: https://www.ada.gov/regs2010/titleII_2010/titleII_2010_regulations.htm
- *DHS Instruction Manual, Appendix A: DHS List of Categorical Exclusions*: https://www.fema.gov/emergency-managers/practitioners/environmental-historic/laws/nepa/categorical-exclusion

Part 4. Eligibility and Requirements

This part identifies eligibility and requirements for all Hazard Mitigation Assistance (HMA) programs, which include the following components:

- Eligible applicants and subapplicants.
- Eligible and ineligible activities.
- Hazard mitigation plan requirements.
- Cost-effectiveness.
- Feasibility and effectiveness.
- Environmental and historic preservation (EHP).
- Cost eligibility.
- Cost sharing.
- Restrictions on the use of HMA.
- Other program requirements.

To be eligible for HMA programs, applicants and subapplicants must apply in the manner described in the HMA Guide.

A. Eligible Applicants

Entities eligible to apply to the HMA programs include the emergency management agency or a similar office of the 50 states (e.g., the office that has primary emergency management or floodplain management responsibility), the District of Columbia, American Samoa, Guam, the U.S. Virgin Islands, Puerto Rico, the Northern Mariana Islands, and federally recognized tribal governments, including Alaska Native villages and organizations. Each state, commonwealth, federally recognized tribal government[73] (including Alaska Native villages and organizations) or territory must designate

[73] The term "Indian tribal government" means the governing body of any Indian or Alaska Native tribe, band, nation, pueblo, village, or community that the Secretary of the Interior acknowledges to exist as an Indian tribe under the Federally Recognized Indian Tribe List Act of 1994 (Section 102 of the Stafford Act, 42 United States Code (U.S.C.) § 5122(6)). This does not include Alaska Native corporations, the ownership of which is vested in private individuals. (Also refer to 44 CFR § 201.2 definitions, referring to 25 U.S.C. § 479a.).

one agency to serve as the applicant for each HMA program. Alaska Native corporations are ineligible, as they are privately owned.

B. Eligible Subapplicants

A subapplicant is generally defined as a non-federal entity that receives a subaward from a pass-through entity (recipient) to carry out part of a federal program.[74] This does not include an individual that is a beneficiary of such a program.

In general, which entity can be a subapplicant depends on the eligibility spelled out in the governing legislation or regulation of the HMA program under which assistance is sought.

Eligible subapplicants may include:

- State agencies.
- Local governments.
- Federally recognized tribal governments.
- Private nonprofit organizations (for the Hazard Mitigation Grant Program [HMGP] and Hazard Mitigation Grant Program Post Fire [HMGP Post Fire] only).[75]

As indicated in Part 4, individuals, businesses and certain private nonprofits are generally ineligible to directly apply for HMA. Applying for HMA happens through eligible subapplicants, who, in turn, submit a subapplication to applicants on behalf of individuals, businesses and private nonprofit organizations. This arrangement ensures consistency with the mitigation priorities established by state, local, tribal and territorial governments.

Table 3 highlights the eligibility of subapplicants under HMGP, HMGP Post Fire, BRIC and FMA.

Table 3: Eligible Subapplicants

Entity	HMGP	HMGP Post Fire	BRIC	FMA
State agencies	Yes	Yes	Yes	Yes
Local governments, including tribal governments*	Yes	Yes	Yes	Yes

[74] 2 CFR § 200.1

[75] For HMGP, refer to 44 CFR § 206.434(a); for the FMA program, refer to 44 CFR § 77.6; for HMGP and Building Resilient Infrastructure and Communities, refer to 44 CFR § 206.2(a)(16); for local governments, refer to 42 U.S.C. § 5122(8) and 44 CFR § 201.2; for private nonprofit organizations, refer to 44 CFR § 206.221(e).

Entity	HMGP	HMGP Post Fire	BRIC	FMA
Federally recognized tribal government	Yes	Yes	Yes	Yes
Private nonprofit organizations and institutions that own and operate a facility that provides an essential government service as defined in 44 CFR § 206.221(e)†	Yes	Yes	No	No
Qualifying conservation private nonprofit organization‡	Yes	Yes	No	No

* Local governments may include non-federally recognized tribes or, consistent with the definition of local government in 42 U.S.C. § 5122(8), may include any tribe, authorized tribal organization, or Alaska Native village or organization that is not federally recognized according to 25 U.S.C. § 479(a) et seq.

† Private nonprofit organizations are defined in 44 CFR 206.221(f).

‡ Limited to acquisition and demolition/relocation projects

B.1. State Agencies

State agencies are any department, commission, council, board, educational institution or official of the executive, legislative or judicial branch of a state or territorial government.

B.2. Local Governments

Local governments are any county, municipality, city, town, township, public authority, school district, special district, intrastate district, council of government, regional or interstate government entity, or an agency or instrumentality of a local government; any tribe or authorized tribal organizations, or Alaska Native village or organization; and any rural community, unincorporated town or village, or other public entity.[76]

B.3. Private Nonprofit Organizations

Under HMGP and HMGP Post Fire, only certain private nonprofits are eligible subapplicants. To be an eligible subapplicant, the private nonprofit must own and operate a private nonprofit facility.[77] A

[76] 42 U.S.C. § 5122(8), 2 CFR § 200.1

[77] 44 CFR § 206.221(e)

qualified conservation organization[78] is the only private nonprofit organization (that does not own or operate a nonprofit facility) that is eligible to apply for acquisition or relocations for open space projects.[79]

To be eligible, a private nonprofit organization must show that it has either one of the following:

- A ruling letter from the Internal Revenue Service that was in effect as of the date of the declaration for HMGP and granted tax exemption under Sections 501(c), (d) and (e) of the Internal Revenue Code of 1954.[80]
- Documentation from the state substantiating it is a nonrevenue producing nonprofit, organized or doing business under state law.[81]

To determine private nonprofit eligibility, the Federal Emergency Management Agency (FEMA) must also determine whether the private nonprofit organization owns or operates a private nonprofit that provides one of the services listed below:

- A facility that provides a critical service, defined as education, utility, irrigation, emergency, medical, or custodial care.[82]
- A facility that provides a noncritical but essential government service and provides those services to the general public.[83]
- Certain types of facilities, such as senior centers, that restrict access in a manner clearly related to the nature of the facility and are still considered to provide essential government services to the general public.

Under Building Resilient Infrastructure and Communities (BRIC) and Flood Mitigation Assistance (FMA), private nonprofit organizations are not eligible subapplicants and cannot apply for HMA. However, an eligible subapplicant may apply on their behalf. Likewise, partnerships that are formed in support of a BRIC project must have an eligible subapplicant submit a subapplication. Partnerships may include private nonprofits as well as other private sector entities.

B.4. Federally Recognized Tribal Government

A federally recognized tribal government has the option to apply for the HMA programs through the state as a subapplicant (when permitted) or directly to FEMA as an applicant. This choice is independent of a designation under other FEMA grants and programs but is not available on a case-

[78] 44 CFR § 80.3(h)
[79] 44 CFR § 206.434
[80] Public Law 591 – Chapter 736 (Aug. 16, 1954), as amended
[81] 44 CFR § 206.221(f)
[82] 44 CFR § 206.221(e)
[83] 44 CFR § 206.221(e)(7)

by-case basis within a single grant program in the same year. If a federally recognized tribe chooses to apply directly to FEMA and an award is made, it bears the full responsibility of a recipient.

Alaska Native Corporations are ineligible, as they are privately owned.

C. Hazard Mitigation Plan Requirements

To be eligible for HMA, all applicants and subapplicants must have a FEMA-approved mitigation plan. Applicants and subapplicants must adopt the mitigation plan before FEMA approves it. This section presents information on how applicants and subapplicants can meet the mitigation plan requirement. It also presents information on extraordinary circumstances and the requirement for conformance with hazard mitigation plans for HMA activities. Guidance for developing and updating mitigation plans can be found on the "Hazard Mitigation Planning" webpage.

C.1. Applicant Mitigation Plan Requirements

All applicants for BRIC and FMA must have a FEMA-approved state or tribal (standard or enhanced) mitigation plan by the application deadline and at the time of obligation of the award.[84] State agencies and federally recognized tribal governments applying for HMGP and HMGP Post Fire assistance must have a FEMA-approved state or tribal (standard or enhanced) mitigation plan at the time of the major disaster declaration or FMAG declaration and at the time HMGP or HMGP Post Fire assistance is obligated to the recipient or subrecipient.[85] A lapse in the FEMA-approved mitigation plan will result in a temporary hold on additional obligations until the mitigation plan regains FEMA approval.

C.2. Subapplicant Mitigation Plan Requirements

All subapplicants for BRIC and FMA must have an approved local or tribal mitigation plan by the application deadline and at the time of obligation of grant assistance, unless otherwise noted by the applicable NOFO.[86] All subapplicants (except for private nonprofits) for HMGP and HMGP Post Fire must have an approved local or tribal mitigation plan at the time of obligation of grant assistance.[87] Private nonprofit subapplicants do not have mitigation plan requirements as a condition of subapplicant eligibility. While a private nonprofit does not need to have a local or tribal mitigation plan itself, the jurisdiction in which the proposed activity is located must have a current, FEMA-approved local or tribal mitigation plan. Subapplicants without current mitigation plans may apply to any of the HMA programs for assistance to develop a new plan. State agencies are eligible

[84] 44 CFR Part 201, 44 CFR § 77.6(b)
[85] 44 CFR § 206.434(c)(1)
[86] 44 CFR § 201.6, 44 CFR § 201.7
[87] 44 CFR § 206.434(b)

subapplicants under HMGP, HMGP Post Fire, BRIC or FMA; a FEMA-approved state mitigation plan is required as a condition of the state agencies receiving assistance.[88]

The way tribal governments apply as a subapplicant determines how the tribe must meet the mitigation requirement. The three scenarios are as follows:

1. If a federally recognized tribal government agency or department applies as a subapplicant under HMGP, HMGP Post Fire, BRIC or FMA, then a tribal mitigation plan is required as a condition of receiving assistance.[89]
2. If a tribal government that meets the definition of local government (such as tribal governments that are not federally recognized) applies as subapplicant under HMGP, HMGP Post Fire, BRIC or FMA, then a tribal mitigation plan is required as a condition of receiving assistance.[90]
3. If a federally recognized tribal government coordinates the review of its tribal mitigation plan with the recipient, it can apply as a subapplicant through that recipient (i.e., a state or another federally recognized tribe).[91]

A lapse in the FEMA-approved mitigation plan may result in a temporary hold on additional obligations until the mitigation plan regains FEMA approval.

C.2.1. EXTRAORDINARY CIRCUMSTANCES

A local government or tribal government applying as a subapplicant must have a mitigation plan approved to receive HMA project subawards. However, the FEMA regional administrator may grant an exception to the plan requirements in extraordinary circumstances when the appropriate justification is provided.[92]

For HMGP, HMGP Post Fire, BRIC and FMA, extraordinary circumstances exist when FEMA or the applicant determine that the proposed project is consistent with the priorities and strategies identified in the state or tribal (standard or enhanced) mitigation plan and that the jurisdiction meets at least one of the criteria below:

- The jurisdiction meets the small impoverished community criteria.[93]
- The jurisdiction has been determined to have had insufficient capacity because of lack of available assistance, staffing or other necessary expertise to satisfy the mitigation planning requirement prior to the current disaster or application deadline.

[88] 44 CFR § 201.4
[89] 44 CFR § 201.7
[90] 44 CFR § 201.7
[91] 44 CFR § 201.7
[92] 44 CFR § 201.6(a)(3), 44 CFR § 201.7(a)(2)
[93] 42 U.S.C. § 5133(a)

- The jurisdiction experienced significant disruption from a declared disaster or another event that impacts its ability to complete the mitigation planning process prior to award or final approval of a project award.

- The jurisdiction does not have a mitigation plan for reasons beyond the control of the state, federally recognized tribal government or local community, such as Disaster Relief Fund restrictions, that delay FEMA from granting a subaward prior to the expiration of the local or tribal mitigation plan.

The applicant must provide written justification that identifies the specific criteria from the above list and explains why the jurisdiction will be able to have a plan both approved by FEMA and adopted by the jurisdiction within 12 months. The justification must identify the specific actions or circumstances that have eliminated or will eliminate the deficiency that prevented the jurisdiction from previously having an approved plan. The justification must clearly demonstrate how the above circumstances impacted the community beyond just stating the above circumstances.

If FEMA grants an extraordinary circumstances exception, a local or tribal mitigation plan must be approved by FEMA within 12 months of the award of the project subaward to that community. The recipient must acknowledge in writing to the regional administrator that the jurisdiction will complete a plan within 12 months of the subaward. The recipient must provide a Compliance Action Plan for completing the local or tribal mitigation plan, including milestones and a timetable, to ensure the jurisdiction will complete the plan in the required time. This requirement must be incorporated into the award (both the planning and project subaward agreements if a planning subaward is also awarded). If a plan is not provided within this time frame, the project subaward will be terminated, and any costs incurred after notice of subaward termination will not be reimbursed by FEMA.[94] FEMA must notify the recipient of the subaward termination. For more information on award termination, refer to Part 8.

If the mitigation plan is not approved by FEMA within 12 months of the award, and if the subaward also involved a mitigation planning award, FEMA should notify the recipient of its failure to meet the additional specific award or subaward conditions and request that the issue be corrected following remedies for non-compliance procedures in Part 8. If compliance cannot be achieved, FEMA will apply a remedy action to the planning subaward to address the non-compliance and may, as a result, withhold assistance, recoup assistance, suspend or terminate the planning subaward.[95]

C.2.2. CONSISTENCY WITH HAZARD MITIGATION PLANS

Activities submitted for consideration for HMA must be consistent with the current, FEMA-approved state or tribal (standard or enhanced) mitigation plan as well as the local or tribal mitigation plan for the jurisdiction in which the activity is located.[96] Specifically, the activity must be consistent with the

[94] 44 CFR § 201.6(a)(3)
[95] 2 CFR § 200.339
[96] 44 CFR § 206.434(c)(1), 44 CFR § 201.4, 44 CFR § 201.6

goals and objectives of the plan, and it must directly reduce the vulnerabilities identified in the risk assessment.

Often state agencies, acting as the subrecipients, administer subawards for state assets. In these instances, the state is required to have a FEMA-approved state mitigation plan, but a local or tribal mitigation plan is not required. For example, the mitigation of a state-owned transportation facility located within the jurisdiction of a local government that does not have a mitigation plan may be eligible for HMA programs. The state's Department of Transportation (DOT) may submit a subapplication to protect the facility, provided its assets are covered in the state's mitigation plan, even if the local jurisdiction does not have a mitigation plan.

Additionally, a local or tribal mitigation plan is not required when a state agency or private nonprofit, acting as a subapplicant, proposes an activity that meets all of the following criteria:

- The activity will be administered by the state agency or private nonprofit as a statewide initiative or program.
- The statewide initiative or program is consistent with the goals and objectives of the current FEMA-approved state or tribal (standard or enhanced) mitigation plan.
- The state agency or private nonprofit is not applying on behalf of or instead of a local government to circumvent the local or tribal mitigation plan requirement.
- The community in which the activity is located does not have any financial interest in the subaward (e.g., property ownership, long-term maintenance) or significant authority over the activity (except for permits under current building codes).

Where there is a local or tribal government planning requirement (for the subrecipient), statewide plans will not be accepted as multi-jurisdictional plans.[97]

D. Eligible Activities

To be eligible, activities must meet all requirements referenced in the HMA Guide. Table 4 summarizes eligible activities that may be funded by the HMA programs. This table is not comprehensive, and FEMA encourages subapplicants to submit new and innovative activities that may not be specifically outlined below.

Eligible activities fall into three categories:

1. Capability- and Capacity-Building (non-construction) (Part 11).
    a. Mitigation planning and planning-related activities.

[97] 44 CFR § 201.6(a)(4)

b. Project scoping/advance assistance.

c. Partnerships.

d. Technical assistance (financial/non-financial).

e. Codes and standards.

2. Mitigation projects (construction) (Part 12).

3. Management costs (Part 13).

Table 4: Eligible Activities by Program

Eligible Activities	HMGP	HMGP Post Fire	BRIC	FMA
1. Capability- and Capacity-Building				
New Plan Creation and Updates	Yes	Yes	Yes	Yes*
Planning-Related Activities	Yes	Yes	Yes	No
Project Scoping/Advance Assistance	Yes	Yes	Yes	Yes
Financial Technical Assistance	No	No	No	Yes
Direct Non-financial Technical Assistance	No	No	Yes	No
Partnerships	No	No	Yes	Yes
Codes and Standards	Yes	Yes	Yes	No
Innovative Capability- and Capacity-Building†	Yes	Yes	Yes	Yes
2. Mitigation Projects				
Property Acquisition	Yes	Yes	Yes	Yes
Structure Elevation	Yes	Yes	Yes	Yes
Mitigation Reconstruction	Yes	Yes	Yes	Yes
Localized Flood Risk Reduction	Yes	Yes	Yes	Yes
Non-Localized Flood Risk Reduction	Yes	Yes	Yes	Yes**
Stabilization	Yes	Yes	Yes	Yes
Dry Floodproofing Non-Residential Building	Yes	Yes	Yes	Yes
Tsunami Vertical Evacuation	Yes	Yes	Yes	No
Safe Room	Yes	Yes	Yes	No

Eligible Activities	HMGP	HMGP Post Fire	BRIC	FMA
Wildfire Mitigation	Yes	Yes	Yes	No
Retrofit	Yes	Yes	Yes	Yes†
Secondary Power Source	Yes	Yes	Yes	No
Warning System (excluding earthquake early warning system)	Yes	Yes	Yes	No
Earthquake Early Warning System	Yes	Yes	Yes	No
Aquifer Recharge, Storage and Recovery	Yes	Yes	Yes	Yes***
Innovative Mitigation Project††	Yes	Yes	Yes	Yes
3. Management Costs	Yes	Yes	Yes	Yes

* For FMA, new plans and plan updates must provide for the reduction of flood losses to structures for which National Flood Insurance Program (NFIP) coverage is available.[98]

** For FMA, non-localized flood risk reduction projects such as dikes, levees, floodwalls, seawalls, groins, jetties, dams and large-scale waterway channelization projects are not eligible unless the administrator specifically determines in approving a mitigation plan that such activities are the most cost-effective mitigation activities for the National Flood Mitigation Fund.

*** For FMA, aquifer recharge, storage and recovery projects may be eligible under FMA if the purpose of the project is to provide flood mitigation benefits to NFIP participating communities and is demonstrated to eliminate future claims against the NFIP.

† Only flood-related retrofitting projects are eligible.

†† Innovative Capability- and Capacity-Building Activities and Innovative Mitigation Projects not described in the HMA Guide will be evaluated on their own merit against program requirements. Eligible activities will be approved on a case-by-case basis if assistance is available.

D.1. Capability- and Capacity-Building

The following assistance strategies can be used to develop mitigation activities. For a complete description of eligibility criteria for each of these categories, refer to Part 11.

D.1.1. NEW PLAN CREATION AND PLAN UPDATES

Natural hazard mitigation planning consists of the process used by state, local and tribal governments to engage stakeholders, identify hazards and vulnerabilities, develop a long-term strategy to reduce risk and future losses, and implement the plan, taking advantage of a wide range of resources. New plan creation and plan update activities must result in a mitigation plan adopted

[98] 44 CFR § 77.6(b).

by the jurisdiction(s) and approved by FEMA. New plan creation and plan updates are eligible under HMGP, HMGP Post Fire, BRIC and FMA.

D.1.2. PLANNING-RELATED ACTIVITIES

To strengthen hazard mitigation across the country, FEMA supports a variety of planning-related activities under HMGP, HMGP Post Fire and BRIC. This assistance provides flexibility to state, local and tribal governments to reduce risk and integrate hazard mitigation principles into planning for resilience.

D.1.3. PROJECT SCOPING/ADVANCE ASSISTANCE

Project scoping/advance assistance refers to the same set of activities that enable applicants and subapplicants to develop mitigation strategies and obtain data to prioritize, select and develop complete applications in a timely manner.

D.1.4. TECHNICAL ASSISTANCE (FINANCIAL AND NON-FINANCIAL)

Financial technical assistance awards are only available under FMA and are meant to allow applicants to maintain a viable FMA program over time.[99] Eligible activities include program promotion, site visits, application development and review, planning and grants management workshops and staff assistance.

Non-financial technical assistance is available under BRIC to allow communities to support mitigation outcomes to improve resilience to natural hazards, sustain successful mitigation programs, submit high-quality applications and implement innovative activities to reduce risk.[100] Through non-financial Direct Technical Assistance, FEMA will provide support for both activity-specific needs and community-wide resilience needs. Refer to the applicable Notice of Funding Opportunity (NOFO) for more information.

D.1.5. PARTNERSHIPS

Community resilience cannot be achieved without leveraging a broad network of partners that include (but are not limited to) all levels of government, the private sector, private nonprofits, and educational institutions. These partners are key to driving investments in mitigation projects, building capability through training and technical assistance, planning for increased resilience, promoting mitigation activities, and sharing information to promote and sustain a ready FEMA and prepared nation.

[99] 42 U.S.C. § 4104c(c)(3)(J)
[100] Section 203(e) of the Stafford Act, 42 U.S.C. § 5133(e)

To ensure applicants and subapplicants can build partnerships to support their mitigation efforts, partnership activities may be eligible under BRIC and FMA. For more information, refer to Part 11 and the applicable BRIC and FMA NOFOs.

Partnership activities are not eligible under HMGP.

D.1.6. CODES AND STANDARDS

FEMA will fund the development, adoption, evaluation, enhancement and enforcement of building codes and standards through HMA. Assistance for building code-related activities is available through the HMGP, HMGP Post Fire and BRIC programs. Eligible activities under these three programs are generally the same; program-specific restrictions are detailed in Part 11.

D.2. Mitigation Projects

Eligible mitigation project types are described below. More information regarding these project types can be found in Part 12.

D.2.1. PROPERTY ACQUISITION

Property acquisition is the purchase of an existing at-risk structure and, typically, the underlying land from a voluntary owner, as well as the conversion of the land to open space. The existing structure is either demolished or physically relocated to an area outside of a hazard-prone area (e.g., outside of the Special Flood Hazard Area [SFHA], high fire zone area or a regulatory erosion zone). In some cases, undeveloped, at-risk land adjacent to an eligible property with existing structures may be eligible. The property must be deed restricted in perpetuity to open space uses to restore and/or conserve the natural floodplain functions.[101]

D.2.2. STRUCTURE ELEVATION

Structure elevation is the physical raising and/or retrofitting of an existing structure. Elevation may be achieved through a variety of methods, including elevating on continuous foundation walls; elevating on open foundations, such as piles, piers, posts or columns; elevating on fill; and second-story conversion.

D.2.3. MITIGATION RECONSTRUCTION

Mitigation reconstruction is the construction of an improved, elevated structure that conforms to the latest building codes on the same site where an existing structure and/or foundation has been partially or completely demolished or destroyed.

[101] 44 CFR § 80.11

D.2.4. FLOOD RISK REDUCTION

Flood risk reduction projects are designed to lessen the frequency of flooding or depth of flood water. Flood risk reduction project types fall into two categories: localized and non-localized.

Localized flood risk reduction projects are used to lessen the frequency or severity of flooding and decrease predicted flood damage within an isolated and confined drainage or catchment area that is not hydraulically linked or connected to a larger basin. Examples of these projects include the following:

- Installation or modification of culverts and other stormwater management facilities.
- Flood diversion and storage measures.
- Slope stabilization or grading.
- Flood protection measures for sewer or other utility systems.
- Vegetation management for shoreline stabilization.
- Flood protection and stabilization for roads and bridges.

Non-localized flood risk reduction projects should lessen the frequency or severity of flooding and decrease predicted flood damage within an area that is hydraulically linked or connected to a drainage basin that is regional in scale. These projects reduce flood hazards in areas larger than that of localized flood reduction projects. The projects may include the construction, demolition or rehabilitation of dams; the construction or modification of dikes, levees, floodwalls, seawalls, groins, jetties, breakwaters and stabilized sand dunes; and the large-scale channelization of a waterway.

D.2.5. STABILIZATION

Stabilization projects reduce risk to structures or infrastructure from erosion and landslides by installing geosynthetics, stabilizing sod, installing vegetative buffer strips, preserving mature vegetation, decreasing slope angles, and stabilizing with riprap and other means of slope anchoring.

D.2.6. FLOODPROOFING

Dry floodproofing techniques are applied to keep structures dry by sealing the structure to keep floodwaters out. Dry floodproofing of historic residential structures is permissible only when other techniques that would mitigate the Base Flood Elevation would cause the structure to lose its status as a historic structure. Dry floodproofing projects are eligible for non-residential and historic residential structures under all HMA programs. Wet floodproofing consists of the use of flood-damage-resistant materials and construction techniques to minimize flood damage to areas below the flood protection level of a non-residential structure, which is intentionally allowed to flood. Wet floodproofing projects are eligible for non-residential structures under all HMA programs.

D.2.7. TSUNAMI VERTICAL EVACUATION

Tsunami vertical evacuation projects are designed to provide immediate life-safety protection in the event of a tsunami, with sufficient height to elevate evacuees above the tsunami inundation depth. This type of project includes retrofitting existing structures, constructing new vertical evacuation structures, or converting natural topographic features to enable vertical evacuation.

D.2.8. SAFE ROOM

Safe room projects are designed and constructed to provide immediate life-safety protection for people in public and private structures from severe wind events, including hurricanes and tornadoes. For HMA programs, the term "safe room" only applies to structures that meet the criteria in FEMA P-361, *Safe Rooms for Tornadoes and Hurricanes, Fourth Edition* (April 2021), to provide protection from tornadoes and/or hurricanes, including residential and community safe rooms. This type of project includes retrofits of existing facilities or new safe room projects and applies to both sole-use and multiuse facilities.

D.2.9. WILDFIRE MITIGATION

Wildfire mitigation projects mitigate at-risk structures and associated loss of life from the threat of future wildfire through:

- **Defensible space**: Creation of perimeters around homes, structures and critical facilities through the removal or reduction of flammable vegetation.
- **Ignition-resistant building materials**: Application of ignition-resistant techniques and/or non-combustible materials on new and existing homes, structures and critical facilities.
- **Fire suppression systems**: Exterior sprinkler systems to help extinguish flames and prevent the spread of fire to nearby buildings or combustible vegetation.
- **Fuels reduction/vegetation management**: Removal of vegetative fuels proximate to at-risk structures that, if ignited, pose a significant threat to human life and property, especially critical facilities.
- **Post-wildfire flooding prevention and sediment reduction measures**: Preventative measures that protect property at the base of slopes made vulnerable to erosion and/or flooding because of loss of vegetation or changes in soil composition post-wildfire.

D.2.10. RETROFIT

Retrofits are modifications to existing structures to reduce or eliminate the risk of future damage and to protect inhabitants. Retrofits can be structural or non-structural and can be done for a range of hazards.

Structural retrofits address the structural elements of a building or facility that are essential to prevent damage, including foundations, load-bearing walls, lateral load-resisting systems, beams, columns, building envelope, structural floors and roofs, and the connections between these elements. An example of an earthquake structural retrofit would be the installation of base isolation or energy dissipation systems in accordance with the latest building codes and standards.

Non-structural retrofits modify the non-structural elements of a building or facility to reduce or eliminate the risk of future damage and to protect inhabitants. Non-structural retrofits may include anchoring major mechanical, electrical, plumbing and architectural components to load-bearing structure or foundation and bracing of building contents to prevent earthquake damage or the elevation of utilities.

Structural and non-structural retrofits reduce or eliminate risk of future damage to existing infrastructure. Retrofits may include existing roads and bridges or infrastructure/lifelines such as energy utilities, communications systems and public water systems.

D.2.11. SECONDARY POWER SOURCE

Secondary power sources increase power system resilience and mitigate the impacts of natural hazards while increasing the resilience of critical functions.

The purchase and installation of secondary power sources and related equipment, such as generators, microgrids, solar photovoltaic systems, and battery back-up systems are generally eligible if they are cost-effective, contribute to a long-term solution to the problem they are intended to address, and meet all other program eligibility criteria. Additional secondary power sources not listed in the HMA Guide may be eligible and will be reviewed on a case-by-case basis.

D.2.12. WARNING SYSTEMS

Warning systems projects include equipment and systems to warn people about natural hazards such as earthquakes, tornadoes, wildfire, tsunamis and flash floods.

D.2.13. AQUIFER RECHARGE, STORAGE AND RECOVERY

Aquifer recharge, storage and recovery projects serve primarily as a drought management tool, but they can also be used to reduce flood risk, mitigate saltwater intrusion and restore aquifers that have been subject to overdraft.

D.3. Management Costs

Management costs are any indirect costs, any direct administrative costs, and any other administrative expenses associated with the administration of HMA awards and subawards. Management costs are provided under HMGP, HMGP Post Fire, BRIC and FMA. More information on management costs can be found in Part 13.

E. Ineligible Activities

The following list provides examples of activities that are not eligible for HMA:

- Activities that do not reduce the risk to people, structures or infrastructure.
- Activities that are dependent on a contingent action to be effective and/or feasible (i.e., not a stand-alone mitigation activity that solves a problem independently or constitutes a functional portion of a solution).[102]
- Projects with the sole purpose of the open space acquisition of unimproved land.[103]
- Property acquisition projects that do not maintain open space in perpetuity according to the requirements of 44 Code of Federal Regulations (CFR) Part 80.
- The cost of any functionality or finishing not directly required for meeting FEMA-approved performance criteria, such as interior or exterior decorative elements and fixtures and floor treatments.
- Projects for which actual physical work, such as groundbreaking, demolition or construction of a raised foundation, has occurred prior to award or final approval, with two exceptions:
    - Properties where private individuals have demolished damaged structures using private assistance or other non-federal assistance prior to application for HMA are eligible for inclusion in HMA project applications if the demolition is not connected to the project.
    - Projects for which demolition and debris removal related to structures proposed for acquisition or mitigation reconstruction has already occurred may be eligible when such activities were initiated or completed under the FEMA Public Assistance (PA) program to alleviate a health or safety hazard as a result of a disaster.
- Activities that establish hazard mitigation revolving loan funds.[104]
- Activities required as a result of negligence or intentional actions that contributed to the conditions to be mitigated; activities intended to remedy a code violation; or the

[102] 44 CFR § 206.434(c)(4)

[103] 44 CFR § 80.11(b)

[104] Public Law 116-284 (Jan. 1, 2021) created Section 205 of the Stafford Act (42 U.S.C. § 5135), authorizing the creation of the Safeguarding Tomorrow through Ongoing Risk Mitigation Revolving Loan Fund (Safeguarding Tomorrow RLF) program. The Safeguarding Tomorrow RLF program provides capitalization grants to states, eligible federally recognized tribes, territories and the District of Columbia to establish revolving loan funds to provide hazard mitigation assistance to local governments to reduce risks from natural hazards and disasters. As of the date of publication of the HMA Guide, FEMA is still developing the Safeguarding Tomorrow RLF program and will issue separate guidance at a later date.

reimbursement of legal obligations, such as those imposed by a legal settlement, court order or state law.

- All projects located in Coastal Barrier Resources System units, other than property acquisition for open space or nature-based stabilization projects provided they qualify for one of the exceptions in Section 6 of the Coastal Barrier Resources Act.[105] For more information, refer to Part 12.
- Projects located in Otherwise Protected Areas that require flood insurance after project completion.
- Activities associated with facilities or land owned by another federal entity where the specific authority relating to the activities lies with another federal entity.
- Retrofitting facilities primarily used for religious purposes, such as places of worship (or other projects that solely benefit religious organizations). However, a place of worship may be included in a property acquisition and structure demolition or relocation project provided that the project benefits the entire community, such as when a significant part of the community is being removed from the hazard area.
- Activities that only address manmade hazards.
- Landscaping for ornamentation (e.g., trees, shrubs).
- Site remediation of hazardous materials (except for eligible activities, such as the abatement of asbestos and/or lead-based paint and the removal of household hazardous wastes for disposal at an approved landfill).
- Projects that address water quality improvement without mitigating hazards to water quality infrastructure.
- Projects that primarily address ecological or agricultural issues.
- Forest management.
- Prescribed burning or clear-cutting.
- Creation and maintenance of access roads or staging areas for wildfire response equipment.
- Creation and maintenance of fire breaks.
- Irrigation systems.

[105] 16 United States Code (U.S.C.) § 3505

- Preparedness and response measures and equipment. (e.g., construction of emergency operations centers and fire stations; installation or purchase of sandbags, bladders, geotubes, and interoperable communications equipment; development/offering of response training).
- Projects that, without an increase in the level of protection, address the operation, deferred or future maintenance, rehabilitation, restoration or replacement of existing structures, facilities or infrastructure (e.g., dredging; debris removal; replacement of obsolete utility systems or bridges; or maintenance/rehabilitation of facilities, including dams and other flood risk reduction structures).
- Activities that address unmet needs from a disaster that are not related to mitigation.
- Studies not directly related to the design and implementation of a proposed mitigation project.
- Activities excluded from funding because of duplication of programs or duplication of benefits. For more information refer to Part 4.K.

FEMA may, at its discretion, choose not to fund activities subject to ongoing litigation if such litigation may affect the eligibility of the activity or may substantially delay implementation of the activity. All projects must also comply with any additional project-specific guidance provided in Part 11 or Part 12.

F. Feasibility and Effectiveness

Subapplicants will have to document that their projects are feasible and effective at mitigating the risks for which the project was designed.[106] In the project narrative, the subapplicant may need to demonstrate the engineering practices, established codes and standards, and modeling applicable to the project.

For specific feasibility and effectiveness requirements by project type, refer to Part 12.

F.1. Hazard Mitigation Assistance Efficiencies

FEMA accepts the engineering design for a project if a licensed professional engineer (or other design professional licensed by the state to practice in the discipline being certified by the individual) certifies that the design meets the appropriate code or industry design and construction standards. FEMA will accept the certified engineering design in lieu of the FEMA comprehensive technical feasibility review. For example, if a licensed professional engineer certifies that the design of a

[106] 44 CFR § 206.434(c)

community safe room project meets or exceeds FEMA P-361 criteria for design and construction, FEMA will not perform a detailed design review to ensure compliance with the criteria.

G. Environmental and Historic Preservation Requirements

HMA programs, and assistance awarded pursuant to these programs, must conform to FEMA Directive 108-1, *Environmental Planning and Historic Preservation Responsibilities and Program Requirements* (Oct. 10, 2018), and with all applicable EHP laws, implementing regulations, and executive orders. This includes but is not limited to the National Environmental Policy Act,[107] the National Historic Preservation Act,[108] the Endangered Species Act,[109] Executive Order (EO) 11988 on *Floodplain Management* (May 24, 1977), as amended by EO 13690 on *Establishing a Federal Flood Risk Management Standard and a Process for Further Soliciting and Considering Stakeholder Input* (Jan. 30, 2015), EO 11990 on *Protection of Wetlands* (May 24, 1977), and EO 12898 on *Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations* (Feb. 11, 1994). By taking the proposed project's impacts to the human environment into account in the decision-making process, EHP requirements ensure that reasonable alternatives are considered. All activities must comply with all federal laws, regulations and executive orders applicable to the environment and historic preservation. To ensure compliance with all EHP laws, regulations and executive orders, additional EHP conditions may be included in the award agreement.

FEMA has the responsibility to ensure a project complies with federal laws, regulations and executive orders related to EHP, which includes coordination with other federal and state agencies and consultation with tribal governments. Applicants and subapplicants should assist FEMA by identifying EHP reviews previously completed by other agencies, gathering data, and reaching out to stakeholders and regulatory agencies for pertinent information. If EHP issues are identified, the applicant and subapplicant should initiate coordination with the relevant federal and state agencies as early in the project planning stages as possible to address any potential EHP issues associated with proposed activities. This coordination does not substitute for, and shall not be interpreted to mean, formal consultation has occurred between FEMA and the applicable federal/state agency or tribal government.

Below is a general summary of the EHP compliance review process before a federal award may be made.

FEMA will:

[107] Public Law 91-190 (Jan. 1, 1970), 42 U.S.C. § 4321
[108] Public Law 89-665 (Oct. 15, 1966), 36 CFR Part 800
[109] Public Law 93-205 (Dec. 28, 1973), 16 U.S.C. § 1531

- Evaluate any potential impacts to EHP resources and provide the required information and documentation to identify the impact on these resources.
- Complete any required consultation and/or coordination with the appropriate agencies (e.g., the state/tribal Historic Preservation Office, the U.S. Fish and Wildlife Service and the National Marine Fisheries Service) or tribal governments to evaluate potential effects of the proposed project and to identify any measures necessary to avoid or minimize these effects.
- Complete an evaluation of, and document alternatives to, the proposed action that will avoid or minimize these impacts, including consideration of the environmental impact of taking no action.
- Demonstrate that the project will incorporate any EHP mitigation measures required to mitigate the adverse effects on EHP resources.
- Ensure all EHP projects costs, including the costs of known measures to treat adverse effects, are reflected in the project budget estimate.

EHP compliance considers and documents the following resource types or actions: biological, water, coastal, pollution control, debris management, socioeconomic, historical and cultural.

Applicants and subapplicants may apply for projects that are a functional portion of a long-term solution. If this approach is taken, each project must be able to function independently and meet all HMA project eligibility requirements, EHP compliance included. Applicants should include EHP reviews, surveys or studies previously completed as part of the planning process or for other related projects that may be able to help FEMA assess the proposed project with their application.

FEMA is responsible for reviewing connected actions associated with a proposed project, even if the agency is not funding the connected action. Applicants and subapplicants must include information on actions connected to the proposed project in the application even if FEMA is not funding the connected action.

Actions are connected if they:

- Automatically trigger other actions that may require environmental impact statements.
- Cannot or will not proceed unless other actions are taken previously or simultaneously.
- Are interdependent parts of a larger action and depend on the larger action for their justification.[110]

Assistance will not be awarded and the applicant/subapplicant may not initiate the project, other than planning or preparatory work not involving construction or alteration of the land, until FEMA has

[110] 40 CFR 1501.9(e)(1).

completed this review and determines that the project, when completed, will comply with all EHP laws, regulations and executive orders.

FEMA developed guidance to assist in completing the EHP information section of a project subapplication, including online training and information about historic preservation. Technical assistance is also available through the FEMA regional offices, via the toll-free Project Technical Assistance for EHP Helpline 866-222-3580, or via email at ehphelpline@fema.dhs.gov.

G.1. Coastal Barrier Resources System Eligibility Requirements

In accordance with the Coastal Barrier Resources Act,[111] HMA programs may assist projects in otherwise Protected Areas if they do not require flood insurance after project completion.[112] Projects in a John H. Chafee Coastal Barrier Resources System (CBRS) unit are eligible only if they qualify for one of the exceptions in Section 6 of the Coastal Barrier Resources Act.[113] That is, projects are eligible if they are consistent with the purposes of the Coastal Barrier Resources Act and qualify as projects for the study, management, protection and enhancement of fish and wildlife resources and habitats.[114]

- All projects that occur in or adjacent to CBRS units must meet one of the Coastal Barrier Resources Act exceptions and require that FEMA consult with the appropriate U.S. Fish and Wildlife Service Ecological Services field office.
- Proposed actions carried out within or adjacent to an Otherwise Protected Areas do not require consultation with the U.S. Fish and Wildlife Service.

[111] Public Law 97-348 (Oct. 18, 1982), as amended. To remove federal incentives to develop coastal areas, the Coastal Barrier Resources Act designated relatively undeveloped land along the Atlantic and Gulf Coast as part of the John H. Chafee Coastal Barrier Resources System (CBRS) and made these areas ineligible for most new federal assistance.
[112] Congress reauthorized the Coastal Barrier Resources Act with the Coastal Barrier Improvement Act of 1990 (Public Law 101-591 [Nov. 16, 1990], expanding the CBRS to include undeveloped costal barriers along the Florida Keys, Great Lakes, Puerto Rico and the U.S. Virgin Islands. It also added a new category of undeveloped barriers called Otherwise Protected Areas. Otherwise Protected Areas consist of conservation or recreation areas such as national wildlife refuges, state and national parks, local conservation areas and private conservation areas, although they may also contain private areas not for conservation.
[113] 16 United States Code (U.S.C.) § 3505
[114] 16 U.S.C. § 3505(a)(6)(A), 44 CFR § 206.345

EHP Resources

- Environmental & Historic Preservation Grant Preparation Resources: https://www.fema.gov/grants/guidance-tools/environmental-historic/preparation-resources
- FEMA Directive 108-1: *Environmental Planning and Historic Preservation Responsibilities and Program Requirements* https://www.fema.gov/sites/default/files/2020-07/fema_ehp_requirements_2018.pdf
- National Environmental Policy Act: https://www.fema.gov/emergency-managers/practitioners/environmental-historic/laws/nepa
- National Historic Preservation Act: https://www.fema.gov/emergency-managers/practitioners/environmental-historic/laws/nhpa
- Endangered Species Act: https://www.fws.gov/law/endangered-species-act
- Executive Order 11988 on *Floodplain Management* https://www.archives.gov/federal-register/codification/executive-order/11988.html
- Executive Order 11990 on the *Protection of Wetlands* https://www.archives.gov/federal-register/codification/executive-order/11990.html
- Executive Order 12898 on *Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations* https://www.archives.gov/files/federal-register/executive-orders/pdf/12898.pdf
- U.S. Fish and Wildlife Service Coastal Barrier Resources Act Project Consultation: https://www.fws.gov/cbra/Consultations.html

For a comprehensive list of EHP resources, refer to the FEMA EHP webpage: https://www.fema.gov/emergency-managers/practitioners/environmental-historic/laws.

H. Floodplain Management and Protection of Wetlands

All activities assisted by HMA programs must conform to FEMA regulations on floodplain management and protection of wetlands in 44 CFR Part 9 and the eight-step decision-making process (refer to Figure 5). Proposed actions located in the 1% annual chance floodplain (or 0.2% annual chance floodplain for critical actions), and proposed actions that have the potential to affect or be affected by a floodplain or wetland will only be eligible for an award or subaward if the applicant or subapplicant demonstrates that there is no practicable alternative to locating the action in a floodplain or wetland in accordance with 44 CFR §§ 9.9-11.

A critical action is an action for which even a slight chance of flooding poses too great of a risk. It may or may not be associated with a critical facility.[115] FEMA is responsible for determining if an action is a critical action. If FEMA identifies a critical action, FEMA must evaluate potential harm to the action from the 0.2% annual chance flood.

Critical Action Definition

Critical actions are defined in 44 CFR § 9.4, which includes examples of actions for which even a slight chance of flooding is too great. If an action is not specified in 44 CFR Part 9, FEMA uses the U.S. Water Resource Council Floodplain Management Guidelines for Implementing EO 11988, amended by EO 13690, and the following series of questions about the subject structure or facility to determine whether a proposed action is deemed a critical action:

- If flooded, would the proposed action create an added dimension to the disaster, such as for liquefied natural gas terminals and facilities producing and storing highly volatile, toxic or water-reactive materials?
- Given the flood warning lead-time available, would the occupants of buildings such as hospitals, schools and nursing homes be sufficiently mobile to avoid loss of life and injury?
- Would essential and irreplaceable records, utilities and/or emergency services be lost or become inoperative if flooded?

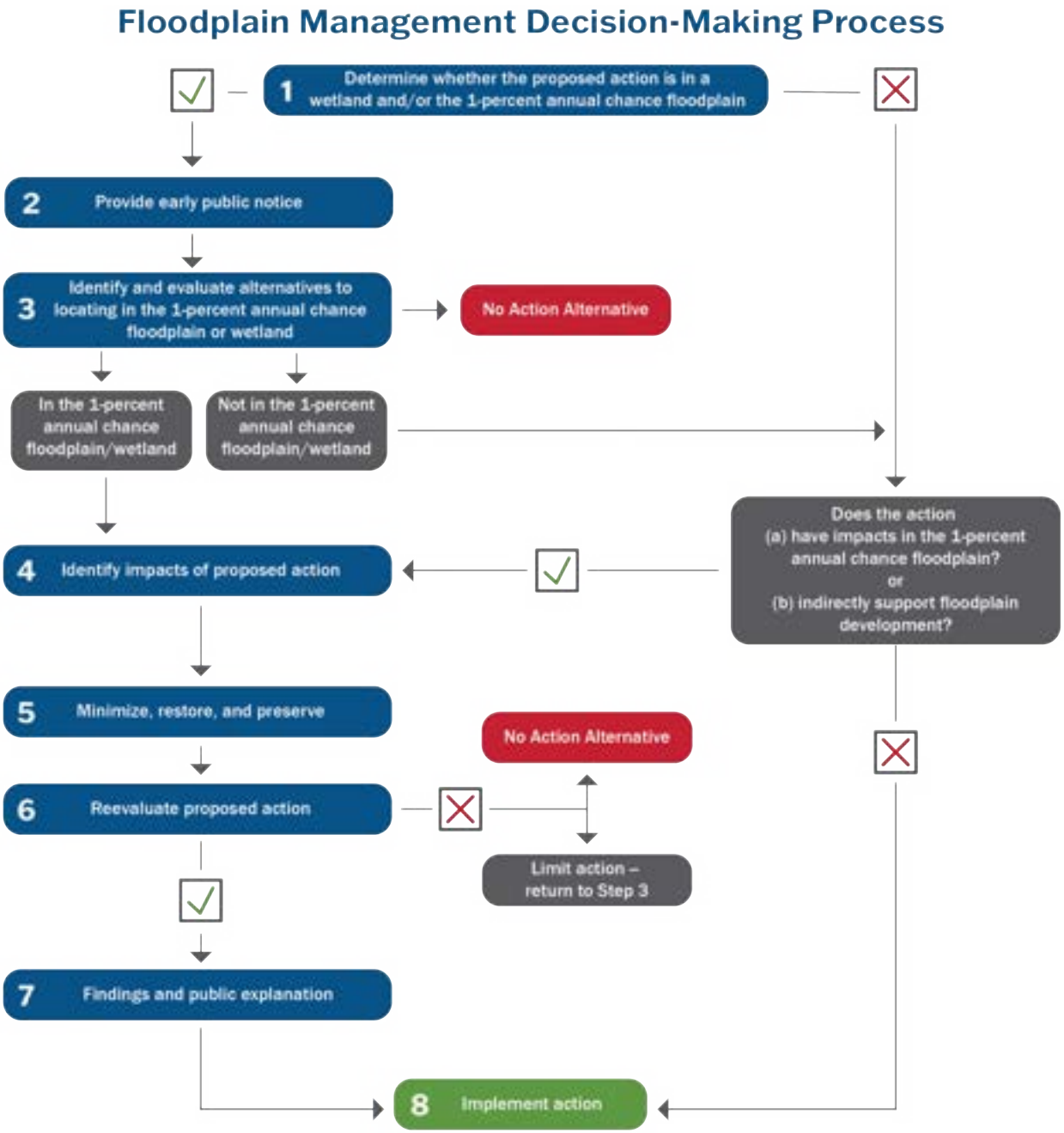
If any of the answers are "yes," then the proposed action is a critical action.

HMA cannot be used to assist new construction or substantial improvements in a floodway or new construction in a Coastal High Hazard Area unless it constitutes a functionally dependent use or facilitates an open space use.[116] Substantial improvement is defined as any reconstruction, rehabilitation, addition or other improvement of a structure, the cost of which equals or exceeds 50% of the market value of the structure before the start of construction of the improvement.[117] However, the costs to elevate or dry floodproof a damaged structure or facility are not included in determining whether the substantial improvement threshold is triggered.

[115] Critical actions and critical facilities are not used interchangeably in the regulation but have specific meanings. Critical facilities are structures and institutions that are deemed by the local community and other jurisdictions as critical to the continuity of the community before, during and after an event. Although the affected jurisdiction has the primary responsibility for determining what structures and institutions are critical facilities, FEMA reserves the right to make a final determination as needed to support the review and approval of an HMA project application.

[116] 44 CFR § 9.11(d)

[117] 44 CFR § 9.4.



Note: Substitute "0.2-percent annual chance floodplain" for "1-percent annual chance floodplain" for critical actions in all eight steps.

Figure 5. Eight-Step Decision-Making Process for Floodplain Management Considerations and Protection of Wetlands

I. Federal Flood Risk Management Standards – Partial Implementation

Certain HMA-funded structure mitigation projects must meet the minimum standards of FEMA's partial implementation of the Federal Flood Risk Management Standards:

- All structure elevation, mitigation reconstruction, and dry floodproofing projects; and
- All projects where HMA funds are used for new construction, substantial improvement, or to address substantial damage to structures.[118]

The identification of the flood hazard must be based on the best available data.[119] This information may be found in Flood Insurance Rate Maps (FIRMs),[120] Flood Insurance Studies or non-FEMA sources as described below:

- If the FIRM is up to date and available and FEMA determines that the best flood hazard information is the FIRM, then applicants must use the 1% and 0.2% annual chance floodplains on that map.
- If FEMA has provided advisory flood hazard information because the effective FIRM is out of date, FEMA will designate the advisory information to be used if the advisory information is at least as restrictive as the effective information. If assistance is provided post-disaster (such as HMGP), FEMA will communicate the availability of floodplain maps or advisory flood hazard information to be used.

The design standards differ depending on whether the action is critical or non-critical and whether the structure is in a 1% or 0.2% annual chance floodplain based on the best available data.[121] If a state, local, tribal, territorial government or federal agency has adopted a higher standard applicable to the specific project, FEMA will require the higher standard.[122]

For non-critical actions in a 1% annual chance floodplain:

[118] Refer to 44 CFR § 9.4 for the definitions of "new construction" and "substantial improvement;" Refer to 44 CFR § 59.1 for the definition of "substantial damage."
[119] Refer to FEMA Policy #104-008-2: *Guidance on the Use of Best Available Flood Hazard Information* for additional information.
[120] Refer to 44 CFR § 59.1 for the definition of "Flood Insurance Rate Map."
[121] Refer to 44 CFR § 9.4 for the definition of "critical action." Non-critical actions are any actions that are not defined as a critical action in 44 CFR § 9.4.
[122] 44 CFR § 9.11(d)(6)

- Applicants must elevate or floodproof structures to the 0.2% annual chance flood elevation or an additional 2 feet above the Base Flood Elevation, whichever is lower.[123] [124]
- For those areas where the 0.2% annual chance flood elevation has not been established, applicants must elevate or floodproof structures an additional 2 feet above the Base Flood Elevation.

For critical actions in the 1% annual chance floodplain:

- Applicants must elevate or floodproof structures to the 0.2% annual chance flood elevation or an additional 3 feet above the Base Flood Elevation, whichever is higher.
- For those areas where the 0.2% annual chance flood elevation has not been established, applicants must elevate or floodproof structures an additional 3 feet above the Base Flood Elevation.

For critical actions in the 0.2% annual chance floodplain:

- Applicants must elevate or floodproof structures to the 0.2% annual chance flood elevation or an additional 3 feet above the Base Flood Elevation, whichever is higher.

This policy does not affect non-critical actions involving structures that are within the 0.2% annual chance floodplain, but outside the 1% annual chance floodplain.

J. Flood Insurance Requirements

J.1. National Flood Insurance Program Requirements

HMA eligibility is related to the National Flood Insurance Program (NFIP) as follows:

- **Applicant and subapplicant eligibility:** States, state agencies, tribal governments and communities participating in the NFIP may apply for FMA planning and project awards and subawards and associated management costs. Communities withdrawn, suspended, on probation or not participating in the NFIP are not eligible to apply for FMA. Certain political subdivisions (i.e., regional flood control districts or county governments) may apply and act as subrecipients if they are part of a community that is participating in the NFIP where the

[123] Under 44 CFR § 9.11(d)(3)(iii), the floodproofing option is limited to non-residential structures. This limitation applies to each section of this policy in which FEMA has referenced floodproofing.
[124] In coastal locations, there may be occasions in which the established 0.2% annual chance flood elevation is lower than the established 1% flood elevation. In those circumstances, applicants must elevate or floodproof the structures an additional 2 feet above the Base Flood Elevation.

political subdivision provides zoning and building code enforcement or planning and community development professional services for that community.

- **Mitigation project eligibility**: HMGP, HMGP Post Fire and BRIC subapplications for mitigation projects sited within a SFHA are eligible only if the jurisdiction in which the project is located is participating in the NFIP. There is no NFIP participation requirement for HMGP, HMGP Post Fire and BRIC subapplications for mitigation projects located outside of the SFHA.

- **Mitigation planning eligibility**: There are no NFIP participation requirements for HMGP, HMGP Post Fire and BRIC hazard mitigation planning subapplications. However, under FMA, the subapplicant and the communities within the planning scope must be participating in the NFIP to be eligible for planning assistance.

- **Property eligibility**: Properties included in a project subapplication for FMA assistance must be NFIP-insured at the time of application start date.[125] Flood insurance must be maintained for the life of the structure regardless of whether the property is subsequently removed from the SFHA.

J.2. Flood Insurance Conditions

For structures in the SFHA at the time of project completion, regardless of HMA funding type, and for all structures receiving assistance through FMA, flood insurance must be maintained after the completion of the mitigation project for the life of the structure (1) to an amount at least equal to the project cost or (2) to the maximum limit of coverage made available with respect to the particular property, whichever is less.[126] The maximum limit of coverage made available is defined as the replacement cost value of the structure up to $250,000 for residential and $500,000 for non-residential. Insurance coverage on the property must be maintained during the life of the property regardless of the transfer of ownership of such property. Insurance must also be maintained regardless of whether the structure is subsequently removed from the SFHA.

The subrecipient (or property owner) must legally record, with the county or appropriate jurisdiction's land records, a notice that includes the name of the current property owner (including book/page reference to record of current title, if readily available), a legal description of the property and the following notice of flood insurance requirements:

> This property has received federal Hazard Mitigation Assistance. Federal law, regulations, and policy require that flood insurance coverage on this structure must be maintained during the life of the property regardless of transfer of ownership of such property [for HMGP, HMGP Post Fire and BRIC, refer to 42 U.S.C. §4012a. For FMA, see 44 CFR 77.6(a)(2)]. Failure to maintain flood insurance coverage will result in the property owner being ineligible for future Hazard Mitigation Assistance awards. The property owner is also

[125] 44 CFR § 77.6(a)(2).
[126] 42 U.S.C. § 4012a(a), 44 CFR § 77.6(a)(2).

> required to maintain this property in accordance with the floodplain management criteria of 44 CFR § 60.3 and any city/county ordinance.

Applicants/subapplicants must ensure that these requirements are met by requesting that the participating property owner(s) sign an *Acknowledgement of Conditions for Properties Using FEMA Hazard Mitigation Assistance* form and providing the form to FEMA prior to award or final approval. This form is available on the FEMA website or can be provided by the appropriate FEMA regional office. Properties that do not meet these requirements will not be eligible to receive assistance under the HMA programs. Additionally, failure to maintain flood insurance coverage will result in the property owner not being eligible for future HMA awards.

If an approved HMA project affects the accuracy of an applicable Flood Insurance Rate Map or requires a map amendment to meet a locally adopted floodplain management ordinance, the subrecipient is responsible for ensuring the appropriate map amendments or revisions are made. Costs associated with these map amendments are to be identified in the budget section of a subaward application and may be eligible costs under the HMA programs.

K. Cost Eligibility

Costs are evaluated both during the application review stage as well as when recipients submit claims and during monitoring activities completed by FEMA. To be eligible, costs must meet the following criteria:[127]

- Be necessary and reasonable to accomplish the work properly and efficiently and be allocable according to the cost principles.
- Conform to any limitations or exclusion set forth in the award. Such limits can be statutory or policy based and are typically set forth in the award or subaward terms that include the program's NOFO announcement by reference.
- Be consistent with the recipient and subrecipient policies and procedures governing the expenditures and activities that are not charged to federal awards. Recipients and subrecipients are not allowed to charge costs to federal awards if those costs are prohibited by their own policies and procedures.
- Be consistent under the recipient and subrecipient policies and practices with respect to classifying them as a direct or indirect cost. For example, recipients may only charge costs to the federal award as indirect costs and the recipient consistently records those same costs as indirect costs when no federal award is involved or is being charged.

[127] 2 CFR § 200.403

- Be determined in accordance with generally accepted accounting principles, as applicable to the recipient and subrecipient.
- Not be federally financed as part of the recipient's cost share.
- Be adequately documented.
- Be incurred during the approved period of performance.

In addition, eligible costs must be reduced by applicable credits,[128] such as duplication of benefits (e.g., insurance claims) [129] and program income.[130]

K.1. Reasonable Costs

A cost is reasonable if, in its nature and amount, it does not exceed that which would be incurred by a prudent person under the circumstances prevailing at the time the non-federal entity decides to incur the cost.[131]

K.1.1. REASONABLE COSTS ANALYSIS

In conducting a reasonable cost analysis, FEMA performs a preliminary review of the documentation to assess the complexity of the activity and the expertise required to complete the analysis. If specialized expertise is required, a subject matter expert with the appropriate specialized skills, knowledge, experience or capability in the appropriate field such as engineering, architecture or cost estimating conducts the analysis.

Considerations include:

- Whether the costs were of a type generally recognized as ordinary and necessary for the operation of a non-federal entity or the proper and efficient performance of the award.
- Restraints or requirements imposed by sound business practices, arm's-length bargaining, applicable laws and regulations, and terms and conditions of the award.
- Market prices.
- Whether the non-federal entity acted prudently in the circumstances concerning its responsibilities.

[128] Stafford Act § 312 and 2 CFR § 200.406
[129] Stafford Act § 312
[130] Stafford Act § 312
[131] 2 CFR § 200.404

- Whether the non-federal entity significantly deviated from its established practices and policies when incurring costs that may have unjustifiably increased the award's costs.[132]

FEMA determines reasonableness by evaluating:

- Whether the skill level and level of effort are necessary to complete the required activity. If the type of employee or skill level is not appropriate for the specific task, FEMA limits HMA to a rate based on the appropriate employee type or skill level. For complex activities, staff with a higher level of technical proficiency and experience may be appropriate.

- Whether the individuals concerned acted with prudence under the circumstances considering their responsibility to the non-federal entity, its employees, its students or membership, the public and the federal government.[133]

- Whether the applicant complied with procurement requirements (Part 4.M.3). FEMA generally considers contract costs reasonable when the non-federal entity adheres to full and open competition under applicable federal procurement requirements, and the scope of services or work in the contract and level of effort is consistent with respect to the eligible scope of work. FEMA evaluates reasonableness when price competition is lacking or when the selection was non-compliant with the applicable procurement under award requirements even though there may have been price competition.

- Whether the non-federal entity selected the lowest responsible bidder based on the selection criteria. If the non-federal entity selected a contractor with a higher bid than others, it must substantiate its selection based on the selection criteria set forth in its request for proposal.

FEMA generally considers the non-federal entity's own labor, equipment and supply costs as reasonable provided the costs are consistent with the non-federal entity's policies including but not limited to pay rates, labor policies and cost schedules used during its normal operations.

The cost or price analysis is one component of documentation that FEMA may review as part of its evaluation of reasonable costs. If the non-federal entity does not submit a cost or price analysis, FEMA may evaluate the elements that would have been part of such analysis. The non-federal entity may need to provide this information if it is not included in the documentation submitted.

FEMA will evaluate whether costs are comparable to the current market price for similar goods or services in the same geographical area.[134] FEMA makes its determination based on one or more of the following:

[132] 2 CFR § 200.404(e)
[133] 2 CFR § 200.404(d)
[134] 2 CFR § 200.404(c)

- Historical documentation (previous contracts, invoices or other documentation). FEMA may compare costs to the non-federal entity's historical costs for similar scope of work or items.
- Average costs in the area.
- Weighted average unit pricing. FEMA may determine the average costs in the area using weighted average unit prices. These consist of the average costs of historical bid tabulations and related specifications from competitive bid pricing solicitations respective to the area and usually includes all factors required to bid on public works projects, such as performance bonds, bid bonds, overhead and profit, and general conditions. The non-federal entity or respective state, territorial or regional agency, such as the state's Department of Transportation may provide weighted average unit pricing and related specifications for FEMA's review.
- Other non-federal entity activity costs. FEMA may compare the costs with other non-federal entity activities of similar scope of work and similar circumstances.
- Published unit costs from national cost-estimating databases. When using this method, FEMA confirms that the cost publication is current and the appropriate locality adjustment factor is applied.
- Industry cost estimating resources. When appropriate local data cannot be developed or obtained, FEMA uses industry-standard construction cost-estimating resources to prepare an estimate against which to evaluate the reasonableness of the non-federal entity's actual costs. These costing methods include but may not be limited to RSMeans, BNi Costbooks, Marshall and Swift, and Sweet's Unit Cost Guide, which are widely accepted in the industry and available for use nationwide.
- Federal, state or territorial unit costs. When industry-standard construction cost estimating resources do not provide work items that are appropriate or applicable to the construction activities required to complete the project, FEMA considers local cost data from other federal agencies or state or territorial agencies responsible for the construction of similar facilities in or near the locality.

When a reasonable cost analysis has been conducted and costs appear high for an activity, FEMA reviews the non-federal entity's justification in the budget narrative, to determine whether any additional factors justify the higher cost as a reasonable amount.

The non-federal entity is responsible for providing documentation to demonstrate its claimed costs are reasonable. Documentation may include, but is not limited to:

- Documentation showing current market price for similar goods or services, such as:
    - Historical documentation.

- Average costs in the area.
- Published unit costs from national cost estimating databases.

- Documentation supporting necessity of unique services or extraordinary level of effort.
- Documentation supporting challenging circumstances, such as news stories or supply chain vendor reports.

If FEMA determines any of the costs to be unreasonable based on its evaluation after completing the evaluation and ensuring that all appropriate costs and factors are included as described above, FEMA may disallow all or part of the costs by adjusting eligible assistance to an amount it determines to be reasonable. When determining the reasonable amount, FEMA may use the least-cost alternative, the lowest bid received by the applicant, or the pricing of another applicant's properly procured and selected contractor.

L. Cost Share

Under the HMA programs, the total cost to implement approved mitigation activities is generally assisted by a combination of federal and non-federal sources. Cost share means the portion of activity costs not paid by federal assistance.[135] Both the federal and non-federal cost shares must be for eligible costs used in direct support of the approved activities in the HMA Guide and the award. Contributions of cash donated or third-party in-kind services, materials or any combination thereof may be accepted as part of the non-federal cost share.

FEMA administers cost share requirements consistent with 2 CFR § 200.1, 2 CFR § 200.306 and 2 CFR § 200.434. To meet cost share requirements, the non-federal contributions must be verifiable from the subrecipient's records; reasonable, allowable, allocable and necessary under the federal program; and compliant with all federal requirements and regulations.

In general, HMA may be used to pay up to 75% of the eligible activity costs.[136] The remaining 25% of eligible activity costs are derived from non-federal sources. Exceptions to the 75% federal and 25% non-federal share are as follows:

- HMGP and HMGP Post Fire: FEMA provides 100% cost share for management costs.
- BRIC:

[135] 2 CFR § 200.1

[136] For HMGP refer to 42 U.S.C. § 5170c(a) and 44 CFR § 206.432(c); for BRIC refer to 42 U.S.C. § 5133(h); for FMA refer to 42 U.S.C. § 4104c(d) and 44 CFR § 77.4(b)(3)

- Small impoverished communities may be eligible for up to a 90% federal cost share. For information about small impoverished communities, refer to Part 10.
- FEMA provides 100% cost share for management costs.

- FMA:
  - FEMA may contribute up to 100% federal cost share for severe repetitive loss structures.[137]
  - FEMA may contribute up to 90% federal cost share for repetitive loss structures.

For BRIC and FMA, the appropriate year's NOFO may contain additional information about cost share availability.

Structures with different federal cost share can be submitted in a single project subapplication. The overall project federal cost share documented in the cost share section of the project subapplication must reflect the combined federal cost share of the structures.

For Insular areas, including American Samoa, Guam, the Northern Mariana Islands and the U.S. Virgin Islands:[138]

- FEMA automatically waives the non-federal cost share when the non-federal cost share for the entire award is less than $200,000 and not an individual subaward.
- Under HMGP, if the non-federal cost share for the entire award is $200,000 or greater, FEMA may waive all or part of the cost share; such a waiver is usually consistent with that provided for PA under the major disaster declaration. If FEMA does not waive the cost share, the insular area must pay the entire cost-share amount, not only the amount greater than $200,000.
- Under FMA and BRIC, if the non-federal cost share for the entire award is $200,000 or greater, FEMA may waive all or part of the non-federal cost share at the request of the recipient. The recipient may request 100% cost share in its application.

Management costs are any indirect costs, any direct administrative costs, and any other administrative expenses associated with the administration of HMA awards and subawards. Management costs are provided under HMGP, HMGP Post Fire, BRIC and FMA.

[137] 44 CFR § 77.4(b)(1)
[138] 48 U.S.C. § 1469a

L.1. Global Match

For HMGP and HMGP Post Fire, global match allows flexibility in which the non-federal cost share does not need to be 25% for each individual subaward; rather, the non-federal cost share for all the applicant's submitted subawards combined must equal 25% of the award. Global match allows the applicant to use any cost share match that exceeds the minimum requirement (referred to as overmatch) from certain subawards to alleviate the financial burden on other activities. For more information on global match, refer to Part 10, Part 10.A.11, and Part 10.B.10.

L.2. Federal Assistance Allowed to be Used as Non-Federal Cost Share

In general, the non-federal cost share requirement may not be met with assistance from other federal agencies; however, some authorizing statutes explicitly allow some federal assistance to be used as a cost share for other federal grants.[139] For example, the Department of Housing and Urban Development Community Development Block Grants program and the Department of Defense Readiness and Environmental Protection Integration program are authorized to allow recipients to use program funds as non-federal cost share, and these funds can be applied to the HMA non-federal cost share.[140] Federal assistance that is used to meet a non-federal cost share requirement must meet the eligibility and compliance requirements of both the other federal source program and the HMA program.[141] More information on allowable funds for non-federal cost share can be found in the *Hazard Mitigation Assistance Cost Share Guide*.

L.3. Increased Cost of Compliance as Non-Federal Cost Share

Increased Cost of Compliance coverage is available to most NFIP policyholders and can be used as non-federal cost share. To qualify for Increased Cost of Compliance, a community must determine that a home or business has sustained substantial damage or the structure meets the local community's repetitive loss provision. The NFIP Increased Cost of Compliance claim payment from a flood event may be used to contribute to the non-federal cost share requirements so long as the claim is made within the timelines allowed by the NFIP. Increased Cost of Compliance payments can only be used for costs that are eligible for Increased Cost of Compliance benefits, which are elevation, floodproofing, relocation or demolition (or any combination of these activities). For example, Increased Cost of Compliance coverage cannot pay for property acquisition but can pay for structure demolition or relocation. In addition, federal assistance cannot be provided where Increased Cost of Compliance assistance is available. If the Increased Cost of Compliance payment exceeds the required non-federal share, the federal assistance award will be reduced to the difference between the cost of the activity and the Increased Cost of Compliance payment.

[139] Section 312 of the Stafford Act, 42 U.S.C. § 5155. 2 CFR § 200.306(b)(5)
[140] 42 U.S.C. § 5305(a)(9); 10 U.S.C. § 2684(a)(h)
[141] Refer to the Community Development Block Grant and Readiness and Environmental Protection Integration program websites for more information about their specific program requirements.

If an Increased Cost of Compliance payment is used as a subapplicant's non-federal cost share, the NFIP policyholder must assign that part of the Increased Cost of Compliance benefit that pertains to the property to the subapplicant. The NFIP policyholder can only assign the Increased Cost of Compliance benefit to the subapplicant; in no case can the policyholder assign the Increased Cost of Compliance benefit to another individual. Steps for the assignment of Increased Cost of Compliance coverage can be found in FEMA P-1080, *Answers to Frequently Asked Questions About Increased Cost of Compliance* (Feb. 2017).

In some cases, individual policyholders can take advantage of federal assistance to supplement the cost of mitigation activities in their community. Policyholders can assign their Increased Cost of Compliance benefits to their community and enable the community to file a single claim on behalf of a community mitigation project. FEMA will count the Increased Cost of Compliance claim monies as non-federal matching assistance in mitigation subapplications because Increased Cost of Compliance coverage is a direct contract between the policyholder and the insurer. The community can then use FEMA mitigation assistance to help pay for any additional portion of the cost of elevation, floodproofing, relocation or demolition that is more than the Increased Cost of Compliance claim payment. Policyholders and community officials must work closely together at every stage of this process.

Individual participation in a FEMA-assisted community mitigation project is voluntary and the community is required to provide mitigation assistance to any property owner whose Increased Cost of Compliance payment was counted toward the matching assistance.

L.3.1. STEPS FOR THE ASSIGNMENT OF COVERAGE D—INCREASED COST OF COMPLIANCE COVERAGE

Policyholders should follow these steps for the assignment of Coverage D:

1. The policyholder consents to the assignment of the Increased Cost of Compliance claim payment.
2. The community official provides the policyholder with an Assignment of Coverage D Form.
3. The policyholder signs the form and provides the signed form to the community official.
4. The community official sends a copy of the completed form, along with the community's signed declaration of substantial damage to the NFIP at the following address:

   NFIP Bureau and Statistical Agent

   8400 Corporate Drive, Suite 350

   Landover, MD 20785

5. The NFIP maintains a database of the increased cost of compliance information submitted by the community. The Bureau then sends the documents to the appropriate Write Your Own company with instructions. The company will then assign an adjuster.

6. The assigned adjuster contacts the policyholder to notify them of receipt of the claim and contacts the local community official to coordinate and help complete the claim.
7. The adjuster receives/reviews the contract for demolition, elevation, relocation or floodproofing to determine the cost.
8. The adjuster has the community official sign the proof of loss once the claim value has been determined.
9. The adjuster sends the final report, along with the proof of loss, to the insurance company for payment.
10. The insurance company issues the check to the community and advises the NFIP of the amount of the claim payment.

For additional information on increased cost of compliance, visit the FEMA "Increased Cost of Compliance Coverage" webpage.

Increased Cost of Compliance Resources

- Increased Cost of Compliance Coverage: https://www.fema.gov/floodplain-management/financial-help/increased-cost-compliance
- FEMA P-1080, *Answers to Frequently Asked Questions About Increased Cost of Compliance*: https://www.fema.gov/sites/default/files/2020-11/fema_p1080_icc_faq_20170817.pdf

M. Additional Requirements

This section presents information on non-discrimination compliance, conflict of interest, procurements by states and other entities, the Uniform Relocation Assistance and Real Property Acquisition Policies Act, duplication of programs, and duplication of benefits.

M.1. Non-Discrimination Compliance

Federal civil rights statutes, such as Section 308 of the Stafford Act[142], Section 504 of the Rehabilitation Act of 1973[143], and Title VI of the Civil Rights Act of 1964[144], along with DHS and FEMA regulations, require HMA programs to be administered in an equitable and impartial manner, without discrimination on the basis of race, color, national origin, sex, religion, age, disability, limited English proficiency, or economic status, as applicable.

[142] 42 U.S.C. § 5151
[143] 29 U.S.C. § 794
[144] 42 U.S.C. § 2000d

Applicants and subapplicants must ensure that no discrimination is practiced in the implementation of HMA programs. Applicants and subapplicants must consider fairness, equity and equal access when prioritizing and selecting subapplications to submit with their grant application. Subapplicants also must ensure fairness and equal access to property owners and individuals that benefit from mitigation activities.

M.2. Conflicts of Interest

Conflicts of interest may arise when FEMA makes a federal award. For example, a conflict of interest may occur in situations where a FEMA employee, officer, or agent; any members of the individual's immediate family; or the individual's partner has a close personal, business, or professional relationship with an applicant, subapplicant, recipient, subrecipient or employee.

The applicant/recipient and subapplicant/subrecipient must maintain written standards of conduct covering conflicts of interest and governing the performance of its employees engaged in the selection, award and administration of subawards and procurement contracts.[145] No employee, officer or agent may participate in the selection, award, or administration of a subaward or contract supported by a federal award if that person has a real or apparent conflict of interest.

The recipient must disclose to FEMA in writing any real or potential conflict of interest, as defined by the federal, state, local or tribal statutes or regulations or their own existing policies, that arise during the administration of the federal award. Recipients must disclose any real or potential conflicts to the federal approving official within 15 calendar days of learning of the conflict of interest. Similarly, subrecipients must disclose any real or potential conflict of interest to the recipient as required by the recipient's conflict of interest policies or any applicable state, local or tribal statutes or regulations. This requirement starts when the application period opens, continues during the entire period of performance, and ends when the last audit is completed.

M.3. Procurement

All applicants, subapplicants and non-federal entities must follow the requirements under the procurement regulations.[146] Federal procurement requirements for state and territorial government agencies are different from those for tribal and local government agencies and private nonprofits. This section provides information on federal procurement and contracting requirements.

In the case of non-compliance, FEMA applies an appropriate remedy in accordance with its authorities.[147] Additional procurement resources may be found on the FEMA "Contracting with Federal Funds for Goods and Services Before, During and After Disasters" webpage.

[145] 2 CFR § 200.112, 2 CFR § 200.318(c)(1)
[146] 2 CFR §§ 200.317-327
[147] 2 CFR § 200.339

M.3.1. PROCUREMENT REQUIREMENTS FOR STATE AND TERRITORIAL GOVERNMENT ENTITIES

When procuring property and services under a federal award, state and territorial governments (acting as either a recipient or subrecipient) must comply with 2 CFR § 200.317, Procurement by States, which includes:

- Following the same policies and procedures used for procurements issued from non-federal assistance.
- Complying with the socioeconomic contracting steps in 2 CFR § 200.321, domestic preferences for procurement guidelines in 2 CFR § 200.322 and the Environmental Protection Agency (EPA) guidelines for procurement of recovered materials in 2 CFR § 200.323.
- Including required provisions[148] in all contracts awarded. Some provisions are based on sound contracting practices while others are required by federal law, executive orders and regulations.

M.3.2. PROCUREMENT AND CONTRACTING REQUIREMENTS FOR TRIBAL AND LOCAL GOVERNMENT AGENCIES AND PRIVATE NONPROFITS

Non-state entities such as tribal and local governments and private nonprofits, must comply with 2 CFR §§ 200.318 - 327. A non-state entity must use its own documented procurement procedures which refelect applicaible state, local, and Tribal laws and regulations provided that the procurements conform to applicable federal law and regulations.

If a federal requirement is different from the state, local, tribal or territorial government requirement or the applicant's own requirements, the applicant must use the requirement that allows for compliance at all levels. Additionally, territorial governments should consult their legal counsel when a project involves a public building or public works facility, as the Buy American Act[149] may apply to the procurement process.

M.3.2.1. Pre-Procurement Considerations

Tribal and local governments and private nonprofits must:

- Establish or update written procurement procedures that reflect applicable state, local, tribal or territorial laws and regulations.[150]

[148] 2 CFR § 200.327
[149] 41 U.S.C. §§ 8301 – 8305
[150] 2 CFR § 200.318(a)

- Maintain required written standards of conduct covering conflicts of interest and governing the performance of employees who engage in the selection, award and administration of contracts.[151]

M.3.2.2. General Federal Procurement Requirements

Federal procurement requirements for tribal and local governments and private nonprofits are found in 2 CFR §§ 200.318 - 327. The requirements include but are not limited to:

- Providing full and open competition.[152] Tribal government applicants may provide preference to Indian organizations or Indian-owned economic enterprises if the non-state, non-federal entity substantiates that it met the Indian Self-Determination and Education Assistance Act[153] requirements.

- Ensuring the use of small and minority businesses, women's business enterprises and labor surplus area firms when possible by conducting the following steps:[154]

  1. Place such organizations that are qualified on solicitation lists.

  2. Ensure such organizations are solicited whenever they are potential sources.

  3. Divide total requirements, when economically feasible, into smaller tasks or quantities.

  4. Establish delivery schedules, where the requirement permits, which encourage their participation.

  5. Use the services and assistance, as appropriate, of the Small Business Administration and the Minority Business Development Agency of the Department of Commerce.

  6. Require prime contractor to conduct the above steps if subcontracting.[155]

- Performing a cost or price analysis in connection with every procurement action above the simplified acquisition threshold,[156] including contract modifications. The non-state, non-federal entity must make independent estimates before receiving bids or proposals.[157] Additionally, the non-state, non-federal entity must negotiate profit as a separate element of

[151] 2 CFR § 200.318(c)(1)
[152] 2 CFR § 200.319
[153] Public Law 93-638 (Jan. 4, 1975), 25 U.S.C. Chapter 46
[154] 2 CFR § 200.321
[155] Tribal government applicants using the Indian Self-Determination and Education Assistance Act preference do not need to separately follow the six socioeconomic steps outlined above.
[156] According to 2 CFR § 200.1, the simplified acquisition threshold for procurement activities administered under federal awards is set by the Federal Acquisition Regulation at 48 CFR Part 2, Subpart 2.1.
[157] 2 CFR § 200.324(a)

the price when it performs a cost analysis and for each contract in which there is no price competition.[158]

- Evaluating and documenting the contractor's integrity, compliance with public policy, record of past performance, and financial and technical resources.
- Ensuring the contractor was not suspended or debarred.[159]
- Prohibiting the use of statutorily or administratively imposed state, local or tribal geographic preferences in evaluating bids or proposals except where expressly encouraged by applicable federal law.[160]
- Excluding contractors that develop or draft specifications, requirements, statements of work, or invitations for bids or requests for proposals from competing for such procurements to ensure objective contractor performance and eliminate unfair competitive advantage.[161]
- Maintaining records to detail the history of the procurement including but not limited to:
  - Rationale for the method of procurement.
  - Selection of contract type.
  - Contractor selection or rejection.
  - The basis for the contract price.[162]

M.3.2.3. Procurement Methods

Tribal and local governments and private nonprofits must use one of the following procurement methods:

- Micro-purchase.
- Small purchase procedure.
- Sealed bid (formal advertising).
- Competitive proposal.

[158] 2 CFR § 200.324(b)
[159] 2 CFR § 200.318(h)
[160] 2 CFR § 200.319(c)
[161] 2 CFR § 200.319(b)
[162] 2 CFR § 200.318(i)

- Non-competitive proposal (sole source).[163]

M.3.2.4. Non-Competitive Procurement

FEMA may reimburse costs incurred under a contract procured through a non-competitive proposal, also referred to as sole source contract, only when one or more of the following circumstances apply:

- The aggregate dollar amount of the acquisition of property or services does not exceed the micro-purchase threshold.
- The item is only available from a single source.
- The public exigency or emergency for the requirement will not permit a delay resulting from competitive solicitation (this exception to competitive procurement is only for work specifically related to the circumstance and only while the circumstances exist). Applicants or subapplicants need to immediately begin the process of competitively procuring similar goods and services and transition to a competitively procured contract as soon as the circumstances cease to exist.
- FEMA or the pass-through entity expressly authorizes a non-competitive proposal in response to a written request from the subapplicant.
- After solicitation of several sources, competition is determined inadequate.[164]

For each non-competitive procurement besides micro-purchases non-state or non-federal entities must identify which of the four circumstances listed above apply and provide all the following information, documentation and justification:

- A brief description of the product or service being procured, including the expected amount of the procurement.
- Explanation of why a non-competitive procurement is necessary. If there was a public exigency or emergency, the justification should explain the specific conditions and circumstances that clearly illustrate why competitive procurement would cause an unacceptable delay in addressing the public exigency or emergency. Failure to plan for the transition to competitive procurement cannot be the basis for continued use of non-competitive procurement based on public exigency or emergency.
- Length of time the non-competitive contract will be used for the defined scope of work, and the impact on that scope of work should the non-competitively procured contract not be available for that amount of time (e.g., how long the applicant anticipates the exigency or emergency circumstances to continue, how long it would take to identify requirements and

[163] 2 CFR § 200.320
[164] 2 CFR § 200.320(c)

award a contract that complies with all procurement requirements, or how long it would take another contractor to reach the same level of competency).

- The specific steps taken to determine that the applicant could not have used, or did not use, full and open competition for the scope of work (e.g., research conducted to determine that there were limited qualified resources available that could meet the contract provisions).
- Any known conflicts of interest and any efforts that were made to identify potential conflicts of interest before the non-competitive procurement occurred. If no efforts were made, explain why.
- Any other justifications.

In the case of non-compliance with non-competitive procurement requirements, FEMA applies an appropriate remedy in accordance with its authorities.[165]

M.3.2.5. Federal Emergency Management Agency Review of a Pass-Through Entity's Approval of Non-Competitive Procurement

A pass-through entity may approve a subrecipient's written request to procure a product or service through a non-competitive proposal method.[166] In cases where a pass-through entity approves a request to use a non-competitive proposal, the approval must be consistent with all applicable state, local, and federally recognized tribal laws and regulations, as well as the pass-through entity's and subrecipient's written procurement standards. Additionally, pass-through entities' and subrecipients' procurements must continue to comply with the requirements, even in cases where the pass-through entity approves a request to use non-competitive proposals.

FEMA may review a pass-through entity's decision to allow a procurement using non-competitive proposals, such as during the award monitoring process, in response to an audit finding or other similar circumstances, or for the reasons specified in 2 CFR § 200.325. During its review, FEMA will inspect the written procurement records for the transaction, including the rationale for the method of procurement, selection of contract type, and contractor selection or rejection.

FEMA will not substitute its judgment for that of the pass-through entity in cases where the pass-through entity has documented justification for allowing a non-competitive procurement. However, FEMA will review the documented justification for approving the non-competitive procurement to ensure it otherwise complies with the requirements of 2 CFR §§ 200.318-327. FEMA may also require the pass-through entity to demonstrate that the decision to approve the non-competitive proposal is consistent with applicable state, local, and federally recognized tribal laws and

[165] 2 CFR § 200.339
[166] 2 CFR § 200.320(c)(4)

regulations, as well as all applicable written procurement standards. FEMA may also assess whether the costs incurred under the procurement are reasonable.

M.3.3. PROHIBITION ON CERTAIN TELECOMMUNICATIONS AND VIDEO SURVEILLANCE SERVICES OR EQUIPMENT

According to 2 CFR § 200.216,[167] recipients and subrecipients, as well as their contractors and subcontractors, may not obligate or expend any FEMA award funds to:

- Procure or obtain any equipment, system or service that uses covered telecommunications equipment or services as a substantial or essential component of any system or as critical technology of any system.
- Enter into, extend or renew a contract to procure or obtain equipment, systems or service that use covered telecommunications equipment or services as a substantial or essential component of any system, or as critical technology of any system.
- Enter into, extend or renew contracts with entities that use covered telecommunications equipment or services as a substantial or essential component of any system, or as critical technology as part of any system.

Covered telecommunications and surveillance equipment are described in Section 889(b)(1) of the John S. McCain National Defense Authorization Act for Fiscal Year 2019 and 2 CFR § 200.216. [168]

FEMA recipients and subrecipients are required to include a provision in their contracts explaining the prohibitions under Section 889(b)(1) of John S. McCain National Defense Authorization Act for Fiscal Year 2019 and 2 CFR § 200.216. This applies to subcontractors under any new, extended or renewed contract. Recipients and subrecipients may draft their own provisions that meet these requirements or use language provided on the FEMA "Contracting with Federal Funds for Goods and Services Before, During and After Disasters" webpage.

M.3.4. BUILD AMERICA, BUY AMERICA ACT REQUIREMENTS

The Build America, Buy America Act[169] requires all federal agencies, including FEMA, to ensure that no federal financial assistance for "infrastructure" projects is provided "unless all of the iron, steel, manufactured products, and construction materials used in the project are produced in the United

[167] According to Section 889(b)(1) of the John S. McCain National Defense Authorization Act for Fiscal Year 2019. On May 10, 2022, FEMA issued Policy #405-143-1, Prohibitions on Expending FEMA Award Funds for Covered Telecommunications Equipment or Services. For the most updated policy and additional information, visit FEMA's "Procurement" webpage.
[168] Public Law 115-232 (Aug. 13, 2018)
[169] Public Law 117-58, Sec. 70901-52

States." BRIC and FMA awards are subject to Buy America requirements. HMGP and HMGP Post Fire are not subject to the Build America, Buy America Act.[170]

Awards under FEMA financial assistance programs subject to the Build America, Buy America Actrequirements, as well as new funding FEMA obligates to existing awards, must comply with the following domestic preference requirements:[171]

- All iron and steel used in the project are produced in the United States.
- All manufactured products purchased with FEMA financial assistance must be produced in the United States.
- All construction materials are manufactured in the United States.

Recipients and subrecipients may request a waiver of the application of the the Build America, Buy America Act requirements in certain limited circumstances. FEMA may approve a waiver request if it finds that:[172]

- Application of the the Build America, Buy America Actrequirements would be inconsistent with the public interest
- Types of iron, steel, manufactured products, or construction materials are not produced in the United States in sufficient and reasonably available quantities or of a satisfactory quality; or
- The inclusion of iron, steel, manufactured products, or construction materials produced in the United States will increase the cost of the overall project by more than 25%.

For more information about the applicability of the the Build America, Buy America Actrequirements and how to submit a waiver, refer to FEMA Interim Policy #207-22-0001 and the FEMA "'Buy America' Preference in FEMA Financial Assistance Programs for Infrastructure" webpage.

M.3.5. REQUIRED CONTRACT CLAUSES

Applicants and subapplicants must include the required contract provisions in 2 CFR § 200.327 in all contracts awarded. Some provisions are based on sound contracting practices while others are required by federal law, executive orders and regulations.

For more information about required and recommended contract provisions, including sample language, refer to Contract Provisions Guide: Navigating Appendix II to Part 200 - Contract Provisions

[170] Public Law 117-58; Sec. 70912(4)(B)
[171] Public Law 117-58; Sec. 70912(2) and Sec. 70914(a)
[172] Public Law 117-58; Sec. 70914(b)

for Non-Federal Entity Contracts Under Federal Awards (fema.gov) and Contracting with Federal Funds for Goods and Services Before, During and After Disasters webpages.

M.3.6. DOCUMENTATION REQUIREMENTS

The recipient or subrecipient should submit the following to support contract costs claimed (not an all-inclusive list):

- Procurement policy (required when requested by FEMA or recipient or subrecipient).
- Procurement documents, such as request for proposals, bids, selection process, etc. (required when requested by FEMA or recipient or subrecipient).[173]
- Federal awarding agency or recipient or subrecipient review.
- A cost or price analysis (required for contracts above the simplified acquisition threshold).
- Contracts, change orders and summary of invoices (required).
- Dates worked (to validate that work was completed within the award's period of performance).
- Documentation that substantiates monitoring, such as weekly logs.

M.3.7. CONFLICTS OF INTEREST

The non-federal entity must maintain written standards of conduct covering conflicts of interest and governing the performance of its employees engaged in the selection, award and administration of contracts.[174] No employee, officer or agent may participate in the selection, award, or administration of a contract supported by a federal award if that person has a real or apparent conflict of interest.

If the non-federal entity has a parent, affiliate or subsidiary organization (that is not a state, local government or federally recognized tribe), then the non-federal entity must also maintain written standards of conduct covering organizational conflicts of interest. Organizational conflicts of interest occur when the non-federal entity is or appears to be unable to be impartial in conducting a procurement action involving a related organization because of relationships with a parent company, affiliate or subsidiary organization.[175]

To ensure objective contractor performance and eliminate an unfair competitive advantage, contractors that develop or draft design plans and specifications, requirements, statements of work

[173] 2 CFR §§ 200.317 - 327
[174] 2 CFR § 200.318(c)(1)
[175] 2 CFR § 200.318(c)(2)

and invitations for bids or requests for proposals must be excluded from competing for such procurements as required.[176]

M.4. Reimbursement for Costs Incurred by Homeowners Contracting to Perform Mitigation Scope of Work

States and non-federal entities are subject to the procurement requirements addressed in 2 CFR Part 200. However, in providing financial assistance under the HMA programs, FEMA may approve a subrecipient's request to use federal assistance to reimburse individual property owners who contract for the performance of eligible mitigation work on their own homes.

Subrecipients may allow property owners to secure contractors to implement the project and then reimburse the property owner with federal assistance. However, the recipient and subrecipient will retain their legal obligations for oversight of the assistance under all applicable program regulations, program guidance, and requirements of 2 CFR Part 200. Program regulations and guidance require the recipient and subrecipient to properly monitor, report on and account for the use of assistance with documentation showing costs are reasonable, necessary, allowable and allocable, and at closeout, all approved projects were completed consistent with award and subaward terms, program requirements and applicable law.[177]

M.5. Uniform Relocation Assistance and Real Property Acquisition Policies Act

HMA projects involving acquisition, rehabilitation or demolition may be subject to the requirements of the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970 (URA).[178] Property owners participating in FEMA-funded property acquisition and structure demolition or relocation projects are not entitled to relocation benefits because the voluntary program meets URA exceptions.[179] However, any displaced person as defined by 42 U.S.C. § 4601(6) (such as a displaced tenant), who is temporarily or permanently displaced from their home or business as a direct result of a HMA-funded project, is entitled to compensation in accordance with 49 CFR Part 24. Costs incurred to meet URA requirements are eligible and should be included in the subapplication budget. The URA requirements detailed under the acquisition project type in Part 12 provide additional information. These requirements apply to all project types where acquisition, rehabilitation or demolition is involved.

M.6. Duplication of Programs

FEMA will not provide assistance for activities for which it determines the more specific authority lies with another federal agency or program. Other programs and authorities should be examined before

[176] 2 CFR § 200.319(b)
[177] 44 CFR §206.433(a), 206.434(c)(5), 206.438(a)(c) and (d), and 206.439; and 2 CFR §§ 200.328 - 200.330, 200.344, 200.403, and 200.405.
[178] Public Law 91-646 (Jan. 2, 1971), 42 U.S.C. Chapter 61
[179] 2 CFR §§ 24.2(a)(9)(ii)(E) or (H) and 2 CFR § 24.101(b)(2)

applying for HMA. HMA programs are not intended to be used as a substitute for other available program authorities. Available program authorities may include other FEMA programs and programs under other federal agencies, such as the EPA, the U.S. Army Corps of Engineers (USACE), and the Natural Resources Conservation Service. FEMA may disallow or recoup amounts that duplicate other authorities. For more information about exceptions to duplication of programs prohibitions on USACE projects, refer to Part 12.B.5.2.3.1.

M.6.1. FEDERALLY AUTHORIZED WATER RESOURCES DEVELOPMENT PROJECTS

Section 1210(b) of the Disaster Recovery Reform Act of 2018 creates an exception for HMGP to the prohibition under HMA that FEMA will not provide financial assistance for activities FEMA has determined another federal agency has more specific authority to conduct.[180] Specifically, section 1210(b) of the Disaster Recovery Reform Act provides that FEMA may use HMGP assistance to fund the construction of federally authorized water resources development projects that would normally fall under the primary authority of USACE, as long as those activities are also eligible under HMGP. For more information, refer to Part 12.B.5.2.3.1.

M.7. Duplication of Benefits and Reporting Requirements

HMA cannot duplicate assistance received by or available to applicants or subapplicants from other sources for the same purpose.[181] If the recipient or subrecipient receives assistance from another source for the same work that FEMA assisted, FEMA reduces the eligible cost or de-obligates assistance to prevent a duplication of benefits.

Recipients, subrecipients and individual property owners are responsible for accurately reporting the availability or receipt of duplicative grants, loans, insurance payments, legal claims, gifts or other payments pertaining to the property being mitigated using HMA. Reporting should occur at any point that such information becomes available, including:

- During application development, pre-award and approval.
- During the award period of performance.
- During closeout.
- After award closeout, if duplicative assistance is received later.

Examples of other sources include insurance claims, other assistance programs (including previous project or planning awards and subawards from other FEMA programs), legal awards or other benefits associated with properties or damage that are subject to litigation.

[180] Division D of Public Law 115-254 (Oct. 5, 2018)
[181] Section 312 of the Stafford Act, 42 U.S.C. § 5155

Duplication of Benefits

Duplication of benefits is used to describe assistance that is from more than one source and that is used for the same purpose or activity. The purpose may apply to the entire activity or only part of it.

Duplication of benefits may apply when assistance for the same purpose:

- Has been received.
- Will be received.
- Is reasonably available from another source, such as insurance or legal settlements due to the property owners.

Because the availability of other sources of mitigation award or loan assistance is subject to available information and the means of each individual applicant, HMA does not require that property owners seek assistance from other sources (except for insurance). However, it is the responsibility of the property owner to report other benefits received, any applications for other assistance, the availability of insurance proceeds, or the potential for other compensation, such as compensation from pending legal claims for damage relating to the property. If the property owner has an insurance policy that could potentially cover mitigation activities (including Increased Cost of Compliance coverage), FEMA will generally require that the property owner file a claim prior to the receipt of aid from HMA.

According to the Privacy Act of 1974,[182] information regarding other assistance received by properties in HMA activities may be shared under 5 U.S.C. § 552a(b). Uses may include sharing with custodians of property records, such as other federal or other governmental agencies, insurance companies, or any public or private entity, to ensure the property has not received money that is duplicative of any possible HMA awards received. When obtaining information from property owners about other sources of assistance, a Privacy Act statement must be distributed to each owner. For more information about the process of verifying potential duplication and Privacy Act requirements, access the Hazard Mitigation Assistance Tool for Identifying Duplication of Benefits. For a copy of the Privacy Act statement, refer to Appendix F of that document.

Eligibility and Requirements Resources

- Hazard Mitigation Planning: https://www.fema.gov/emergency-managers/risk-management/hazard-mitigation-planning

[182] Public Law 93-579 (Dec. 31, 1974), 5 U.S.C. § 552a

- FEMA P-361: *Safe Rooms for Tornadoes and Hurricanes: Guidance for Community and Residential Safe Rooms* https://www.fema.gov/sites/default/files/documents/fema_safe-rooms-for-tornadoes-and-hurricanes_p-361.pdf
- *Hazard Mitigation Assistance Cost Share Guide*: https://www.fema.gov/sites/default/files/2020-08/fema_hma_cost-share-guide.pdf
- FEMA P-1080: *Answers to Frequently Asked Questions About Increased Cost of Compliance* https://www.fema.gov/sites/default/files/2020-11/fema_p1080_icc_faq_20170817.pdf
- Increased Cost of Compliance Coverage: https://www.fema.gov/floodplain-management/financial-help/increased-cost-compliance
- System for Award Management: http://www.sam.gov/SAM/
- Contracting with Federal Funds for Goods and Services Before, During and After Disasters: https://www.fema.gov/grants/procurement

EHP Resources

- Environmental & Historic Preservation Grant Preparation Resources: https://www.fema.gov/grants/guidance-tools/environmental-historic/preparation-resources
- FEMA Directive 108-1: *Environmental Planning and Historic Preservation Responsibilities and Program Requirements* https://www.fema.gov/sites/default/files/2020-07/fema_ehp_requirements_2018.pdf
- National Environmental Policy Act: https://www.fema.gov/emergency-managers/practitioners/environmental-historic/laws/nepa
- National Historic Preservation Act: https://www.fema.gov/emergency-managers/practitioners/environmental-historic/laws/nhpa
- Endangered Species Act: https://www.fws.gov/law/endangered-species-act
- Executive Order 11988 on *Floodplain Management* https://www.archives.gov/federal-register/codification/executive-order/11988.html
- Executive Order 11990 on the *Protection of Wetlands* https://www.archives.gov/federal-register/codification/executive-order/11990.html
- Executive Order 12898 on *Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations* https://www.archives.gov/files/federal-register/executive-orders/pdf/12898.pdf

For a comprehensive list of EHP resources, refer to the FEMA EHP webpage: Environmental Planning and Historic Preservation | fema.gov

Part 5. Cost-Effectiveness

In accordance with authorizing statutes, only cost-effective mitigation measures are eligible for potential funding from the Federal Emergency Management Agency (FEMA).[183] FEMA has specified minimum project criteria via regulation and policy, including that applicants must demonstrate mitigation projects are cost-effective.[184]

FEMA developed several methodologies that applicants and subapplicants may use to demonstrate cost-effectiveness in accordance with Office of Management and Budget (OMB) Circular A-94, *Guidelines and Discount Rates for Benefit-Cost Analysis of Federal Programs*. FEMA generally assesses the cost-effectiveness of hazard mitigation projects through a Benefit-Cost Analysis (BCA)—a quantitative analysis used to assess the cost-effectiveness of a hazard mitigation measure by comparing the project's avoided future damage to the costs over the project lifetime. The result is a Benefit-Cost Ratio (BCR), which is the numerical expression of the cost-effectiveness of a project calculated as the net present value of total project benefits divided by the net present value of total project costs.[185] A project is generally considered to be cost-effective when the BCR is 1.0 or greater, indicating the benefits of a prospective hazard mitigation project are sufficient to justify the costs.

FEMA created the BCA Toolkit to help applicants perform benefit cost analyses in accordance with OMB's guidelines. Through the development of the BCA Toolkit, FEMA created a standardized methodology that is specific to mitigation activities and provides consistency across applicants and subapplicants.

In addition to the BCA Toolkit, FEMA provides several streamlined methodologies that applicants and subapplicants may use to demonstrate cost-effectiveness. While FEMA encourages the use of the BCA Toolkit, applicants and subapplicants may also use a non-FEMA BCA methodology if pre-approved by FEMA in writing.

For Building Resilient Infrastructure and Communities (BRIC) and Flood Mitigation Assistance (FMA), additional information on demonstrating cost-effectiveness may be found in the appropriate year's Notice of Funding Opportunity (NOFO).

[183] For Hazard Mitigation Grant Program (HMGP), refer to 42 United States Code (U.S.C.) § 5170c; for Building Resilient Infrastructure and Communities (BRIC), refer to 42 U.S.C. § 5133; for Flood Mitigation Assistance (FMA), refer to 42 U.S.C. § 4104c

[184] For HMGP, refer to 44 Code of Federal Regulations (CFR) § 206.434; for FMA, refer to 44 CFR Part 77.

[185] OMB Circular A-94 defines net present value as the difference between the discounted present value of benefits and the discounted present value of costs.

A. Exemptions

Certain activities are exempt from the requirement to demonstrate cost-effectiveness by completing a BCA. Exempt activities include:

- Management costs.
- Mitigation planning and planning-related activities.
- Any activities claimed under the 5 Percent Initiative (Refer to Part 10).
- Codes and standards activities.
- Advance assistance under the Hazard Mitigation Grant Program (HMGP) and Hazard Mitigation Grant Program Post Fire (HMGP Post Fire).
- Project scoping under BRIC and FMA.
- Partnership activities.
- Technical assistance awards.
- Earthquake early warning systems.

While OMB Circular A-94 describes an exemption for water resources projects (refer to the White House Council on Environmental Quality *Principles, Requirements and Guidelines for Water and Land Related Resources Implementation Studies* [PR&G] [Dec. 2014]), the cost-effectiveness requirement in the Hazard Mitigation Assistance (HMA) program authorizing statutes must be met. The cost-effectiveness determination should be supplemented by consideration of the PR&G criteria if applicable. Water resources projects may include aquifer recharge, storage and recovery and storage, flood diversion and storage, and floodplain and stream restoration.

More information about specific activities can be found in Part 11, Part 12 and Part 13. Activities may be subject to funding limitations to maintain the cost-effectiveness of the Hazard Mitigation Assistance (HMA) programs.

B. Calculating the Benefit-Cost Ratio

Unless stated otherwise in the HMA Guide or another authoritative source, all subapplications must demonstrate a BCR of 1.0 or greater. Depending on the project type, applicants must use one or more of the following methodologies to document cost-effectiveness.

B.1. Streamlined Benefit-Cost Analysis Methodologies

FEMA offers several streamlined methodologies as alternatives to completing the full BCA using the BCA Toolkit.

B.1.1. SUBSTANTIALLY DAMAGED STRUCTURES IN A RIVERINE SFHA

The acquisition of structures that are declared substantially damaged (from any hazard) and located in a riverine Special Flood Hazard Area (SFHA) on an advisory, preliminary, or effective Flood Insurance Rate Map is considered cost-effective. Substantial damage is defined as damage sustained by a building whereby the cost of restoring the building to its before-damaged condition would equal or exceed 50% of the market value of the building before the damage occurred.[186] If this methodology is used, the project subapplication must include a certification from the local floodplain administrator or a certified state/tribal floodplain specialist that identifies and declares each structure substantially damaged.

B.1.2. PRE-CALCULATED BENEFITS FOR MITIGATION PROJECTS

FEMA calculated several benefit-cost efficiencies to provide pre-calculated cost-effectiveness values. Using these pre-calculated benefits eliminates the requirement for applicants to conduct a separate BCA for eligible projects.

FEMA developed pre-calculated benefits for the following project types:

- Acquisitions, elevations, and mitigation reconstruction in the SFHA.
- Acquisitions of repetitive loss and severe repetitive loss structures outside of the SFHA.
- Residential hurricane wind retrofits.
- Non-residential hurricane wind retrofits.
- Residential tornado safe rooms.
- Post-wildfire mitigation (soil stabilization, flood diversion and reforestation).
- Generators for hospitals.

The precalculated benefits are not intended to drive actual project costs or to serve as a detailed project budget. Individual project budgets must be based on industry standards, vendor estimates or other acceptable sources. Projects must still meet all other applicable award and subaward requirements.

Pre-calculated benefits cannot be combined with benefits from a traditional BCR calculated using the FEMA BCA Toolkit for purposes of aggregation of benefits. The application of excess benefits from the pre-calculated structures cannot be applied to the structure(s) analyzed using the BCA Toolkit or other FEMA-approved methodology. If pre-calculated benefits for a project are not greater than the project costs, the BCA Toolkit can be used to perform BCA.

[186] 44 CFR § 59.1

Detailed information on using pre-calculated benefits can be found by project type in Part 12. Additionally, new pre-calculated benefits and updated values for existing benefits can be found on the FEMA "Benefit-Cost Analysis" webpage.

C. Calculation of the Benefit-Cost Ratio Using the Benefit-Cost Analysis Toolkit

FEMA developed the BCA Toolkit to facilitate the process of preparing a BCA. Using the BCA Toolkit will ensure the calculations are prepared in accordance with OMB Circular A-94 and FEMA's standardized methodologies.

The BCA Toolkit consists of modules for a range of major natural hazards and project types. Given the right data, the BCA Toolkit can analyze nearly any hazard mitigation project type.

The most recent version of the BCA Toolkit, including detailed instructions on how to download and use the tool, may be found on the FEMA "Benefit-Cost Analysis" webpage.

Other methods to demonstrate cost-effectiveness may be used when they address an uncorrectable flaw in the FEMA-approved methodologies or propose a new approach that is unavailable using current tools. New methodologies may be used only if FEMA approves the methodology before application submission. The request must provide justification of why the subapplicant cannot use the standard BCA tools and provide documentation to support the claim.

C.1. Key Elements of the Benefit-Cost Ratio

According to OMB Circular A-94, the BCR is expressed as the net present value of the benefits of the project divided by the costs. OMB Circular A-94 states that BCAs should count benefits and costs to society—meaning that the BCA should capture all benefits and costs of the project, not just benefits or costs accruing to particular entities.

To calculate the BCR, the BCA Toolkit uses hazard and risk data as well as information about the mitigation project such as project effectiveness. The four key elements of the BCR calculation are:

1. The benefits of the project.
2. The costs of the project.
3. The hazard risk (the likelihood and consequences of the hazard causing damage).
4. The economic factors of the analysis (i.e., discount rate and project useful life).

These four key elements are described in the following sections.

C.1.1. PROJECT BENEFITS

The benefits of a hazard mitigation project are any future costs or losses that can be avoided by completing a mitigation project. In other words:

$$Benefits = Costs\ Before\ Mitigation - Costs\ After\ Mitigation$$

The following "costs before mitigation" should be counted regardless of who pays for them, whether that be the federal government; state, local, tribal and territorial governments; or the property owner, and can include the following:

- Physical damage.
- Loss of service/function.
- Injury or death.
- Displacement costs.
- Emergency management costs.
- Maintenance costs.
- National Flood Insurance Program (NFIP) administration costs.

The "costs after mitigation" includes costs after the mitigation project has taken place. For example, if a home is elevated, it will not be damaged until the floodwaters reach the elevated first floor. Costs after mitigation are also known as residual damage. All project types have residual damage except for acquisitions, which demolish a structure and then leave the property as open space in perpetuity. The costs after mitigation reflect the level of protection that the mitigation measure provides (i.e., a house elevated to the 1% annual chance flood level or hurricane shutters that provide protection for up to 120 mile per hour winds).

BCAs should capture all project benefits to the extent feasible, even after the project has already achieved a BCR greater than 1.0. Capturing all possible benefits provides a more comprehensive account of a project's benefits and helps ensure the project remains cost-effective if a cost increase occurs.

C.1.1.1. Physical Damage

Avoided physical damage is one of the primary categories of benefits in FEMA BCAs. Buildings, contents, infrastructure, landscaping, vehicles, agricultural assets and equipment can be damaged by hazard events. This damage has a dollar value (i.e., the cost to repair or replace the damaged property). The benefits of a mitigation project are the reduction in future damage attributable to a mitigation project.

C.1.1.2. Loss of Service/Function

Another major benefit of a hazard mitigation project can be avoided loss of service or function of the facility. This benefit is only applicable to facilities that provide a service to the public, such as utilities, emergency operations facilities (i.e., police, fire), government facilities, infrastructure such as roads and bridges, and educational facilities.

For critical facilities such as police and fire stations and hospitals, the value of services is estimated based on the service population, impacts to service (e.g., increased distance to the nearest fire station, reduced number of hospital beds) and the societal benefits of maintaining that facility in the aftermath of a disaster. For critical and other public facilities such as emergency operations centers, schools or government buildings, the annual operating budget is used as a proxy to estimate the value of services.

C.1.1.3. Injury or Death

For some types of hazard mitigation projects, a major benefit may include avoided human injury and/or loss of life. This benefit is applicable to project types that address hazards having little to no warning time, protect populations that cannot evacuate (e.g., emergency personnel), or protect critical facilities that provide life safety services (such as hospitals).

The BCA Toolkit allows for benefits from avoided human injury and/or death for the following project types:

- Tornado safe rooms.
- Hurricane safe rooms.
- Seismic retrofits.
- Wildfire mitigation.
- Landslide acquisitions.

Injury or death are also considered within the BCA Toolkit methodology for projects mitigating risk to certain critical facilities (i.e., hospitals, emergency medical services and fire stations) based on service populations. Subapplicants may also include benefits for avoided injury and/or loss of life for additional project types, such as extreme temperature, tsunami vertical evacuation structures and dam retrofits, by including supporting documentation to demonstrate the avoided losses.

C.1.1.4. Displacement Costs

Avoided displacement costs may be counted as a benefit. Displacement costs occur when occupants of residential, commercial or public buildings are displaced to temporary quarters while damage is repaired. These costs include rent and other monthly costs, such as furniture rental and utilities, and one-time costs, such as moving and utility hookup fees.

C.1.1.5. Emergency Management Costs

Some projects may have the benefit of avoided emergency management costs. Emergency management costs include a range of disaster response and recovery costs that communities may incur during and immediately after a disaster. In many disasters, these costs are much smaller than physical damage or loss of service impacts.

C.1.1.6. Maintenance Costs

Some hazard mitigation projects may reduce long-term maintenance costs for the owner or operating entity. These benefits may be included in the BCA. For example, if power lines are buried, the utility company may no longer need to trim the trees surrounding the power lines. However, in some cases, the maintenance costs for the mitigation measure could increase and should be reflected in the maintenance cost section of the BCA.

C.1.1.7. National Flood Insurance Program Administration Costs

Properties insured under the NFIP incur administrative fees to run the program. If a property is acquired and demolished, there is no longer an administrative cost to the government for that property; it is therefore an avoided cost and may be counted as a benefit in the BCA. Avoided NFIP administration costs do not have to be calculated; these are standard values that are incorporated into the BCA Toolkit.

C.1.1.8. Volunteer Labor

Any hazard mitigation project that eliminates or reduces the need for volunteer labor can claim this benefit.

It must be clearly demonstrated in the application that the proposed project will reduce or eliminate the future need for the volunteer effort that is being claimed.

C.1.1.9. Social Benefits

Extensive epidemiological research shows there is a causal connection between natural disaster events and the onset of mental health issues, which can be valued as the cost of mental health treatment and lost productivity at work. Social benefits capture the avoided costs associated with mental stress, anxiety and lost wages that disaster survivors would otherwise experience when displaced from their primary residence.

Only projects that protect residential structures and are intended to keep residents from being displaced from their primary residence may include social benefits in the BCA. Social benefits do not apply to projects such as seismic retrofits or residential tornado safe rooms, where the primary benefits are life-safety protection.

Where applicable, a project's BCA may include the precalculated values for social benefits in Table 5. These values are one-time benefits, meaning they do not occur on an annual basis. Any updates to these values will be accounted for in the BCA Toolkit.

Table 5: BCA Social Benefits Values

Social Benefit	Value
Mental stress and anxiety	$2,443/person
Lost productivity	$8,736/person

C.1.1.10. Ecosystem Service Benefits

Ecosystem service benefits are the contributions the project provides to an ecosystem that benefits the environment and human populations such as air quality, water filtration and recreational space. These benefits accrue when a parcel's land use is changed or enhanced by a mitigation activity to one that provides a higher level of natural benefits. For example, the change from urban land use to green space because of mitigating a structure within an acquisition/demolition project will mean improved ecosystem services benefits for water infiltration, habitat, nutrient cycling, climate regulation and other natural environmental and floodplain functions.

Values for these depend on the post-mitigation land cover category and may be found in Table 6. These benefits apply to any project type that results in an improved or restored natural environment. Eligible project types include but are not limited to acquisitions; relocations; post-wildfire revegetation; and floodplain, stream, or coastal restoration. Certain types of projects, such as vegetation management or bank stabilization, may be eligible for ecosystem services benefits depending on the project. These benefits occur on an annual basis over the project useful life. Ecosystem service benefits may only be used when performing a BCA to demonstrate cost-effectiveness; they cannot be combined with precalculated benefits.

Wildfire mitigation projects may qualify for ecosystem services benefits if they protect an existing natural area. Applying ecosystem services benefits to wildfire mitigation projects should be evaluated on a case-by-case basis, as the design of these projects can vary widely. In general, defensible space and ignition-resistant construction projects are not likely to qualify for ecosystem services benefits. A wildfire mitigation project may not include ecosystem services benefits if:

- It does not protect at least one contiguous acre of natural space, such as a forest or grassland.
- It involves the application of chemicals or other unnatural substances.

Table 6: Ecosystem Services Benefits Values

Land Cover Category	Value (2021 U.S. Dollars per acre per year)
Forest	$12,589
Urban Green Open Space	$15,541
Rural Green Open Space	$10,632
Riparian	$37,199
Coastal Wetland	$8,955
Inland Wetland	$8,171
Coral Reefs	$7,120
Shellfish Reefs	$2,757
Beaches and Dunes	$300,649

The land cover category definitions can be found in the *FEMA Ecosystem Service Value Updates* report (June 2022). Any updates to values for ecosystem services benefits can be found in the BCA Toolkit and the FEMA "Benefit-Cost Analysis" webpage.

C.1.1.11. Unallowable Benefits

In general, the following benefits may not be counted in FEMA BCAs:

- Anything that is subjective or unquantifiable (e.g., ease of implementation or aesthetic value of project).
- Anything not impacted by the proposed project.

A definitive connection must be made between the project and claimed benefits. This is especially important when using historical damage in the BCA; the project must reduce or eliminate this damage to include them.

In addition, OMB Circular A-94 guidelines also do not allow the inclusion of the following benefits:

- Employment or output multipliers intended to measure the secondary effects of government expenditures on employment and economic output.
- Anything that is considered a transfer payment may not be counted as an avoided cost. A transfer payment is the reallocation of money by means of an entity (such as the government or a homeowner) making a payment without goods or services being received in return. For example:

- Insurance premiums.
- Government subsidies.
- Fines or penalties, such as Environmental Protection Agency fines.

C.1.2. PROJECT COSTS

The project cost is the denominator in the BCR equation. Any annual maintenance costs associated with the project are discounted by 7% over the project useful life and added to the total project cost.[187]

The costs captured in the BCA must reflect the total project cost required to complete the mitigation activity, not just the federal share. Similarly, some subapplicants may not request HMA up to the available federal cost share. In these cases, the BCA must still use the sum of all required (not just requested) costs necessary to achieve the hazard mitigation purpose of the project. Management costs, as defined in this guide, may be excluded from the project cost for the purpose of the BCA.

Costs should be consistent with the project budget. Refer to Part 6.B.3. Costs of a mitigation project include (but are not necessarily limited to):

- Construction costs.
- Any other project-related costs, such as title searches, appraisals and permits.
- Maintenance costs specifically related to the project that are necessary to sustain the mitigation function.
- Any in-kind contributions or match from the recipient or subrecipient.

C.1.3. RISK

Hazard risk is a key factor in the benefit calculation. The Department of Homeland Security defines risk as "the potential for an unwanted outcome resulting from an incident, event, or occurrence as determined by its likelihood and the associated consequences."[188]

The BCA Toolkit factors in risk by calculating the likelihood of a hazard event occurring and the projected impacts of that event. The BCA Toolkit measures the likelihood of an event using recurrence intervals and calculates different impacts based on the size and severity of the hazard.

[187] OMB Circular A-94
[188] *DHS Risk Lexicon* (Sep. 2008)

The BCA Toolkit weights higher-frequency events more than those that occur less frequently. The probabilities of future events profoundly affect whether a proposed mitigation project is cost-effective.

Recurrence intervals are also location specific. The BCA Toolkit requires location information to assess risk. For example, the Midwest has a higher probability of tornadoes than the Northeast or the Pacific Northwest because that area experiences more tornadoes on an annual basis.

Additionally, risk is not always uniform across hazards within a single event. A hurricane might have windspeeds with a 200-year recurrence interval, but the storm surge might have only a 25-year recurrence interval in the same location.

Calculating risk also considers the potential consequences (or impacts) of a hazard event, which can vary based on facility type. For example, the estimated flood damage for a one-story building will typically be a larger proportion of the total building value than that of a multistory building or a building with a closed versus open foundation. Likewise, estimated deaths and injuries from a tornado are greater for individuals in mobile homes than in concrete structures. Hazard risk data can be found in the applicant's or subapplicant's hazard mitigation plan, including data on previous occurrences, probability (reoccurrence intervals) and potential consequences (impacts).

C.1.4. ECONOMIC FACTORS

C.1.4.1. Discount Rate

Future benefits must be reduced because benefits that are experienced sooner are worth more. The rate at which future benefits are reduced is called the discount rate.

FEMA must use a 7% discount rate in its BCAs for hazard mitigation projects.[189] The discount rate is built into the calculations in the BCA Toolkit and cannot be changed.

C.1.4.2. Project Useful Life

The project useful life is the estimated amount of time the project is expected to remain effective, assuming proper maintenance. In the BCA, the project useful life is the period during which the benefits are accumulated and then discounted to net present value. For example, a project with a 30-year life is assumed, on average, to produce a stream of benefits each year for 30 years. Each year's benefit is discounted to net present value and the sum of these annual benefits is the total benefits of the project.

More information may be found on the FEMA "Benefit-Cost Analysis" webpage.

[189] OMB Circular A-94

C.1.5. ANNUALIZED BENEFITS AND COSTS

Because of the unpredictable nature of hazard events, the BCA Toolkit estimates the benefits of a hazard mitigation project on an annual basis rather than in specific years. The BCA Toolkit uses hazard frequency, damage data and project effectiveness to estimate annualized benefits.

$$Annual\ Benefits = Annual\ Damages\ Before\ Mitigation - Annual\ Damages\ After\ Mitigation$$

C.1.6. DOCUMENTATION REQUIREMENTS

Guidance on appropriate documentation for the data elements in the BCA Toolkit can be found on the FEMA "Benefit-Cost Analysis" webpage. If FEMA standard values are used when completing the BCA Toolkit inputs, no additional documentation is required. If non-standard values are used documentation is required. Documentation must be accurate and sufficiently detailed for the analysis to be validated. FEMA recommends that supporting documentation be obtained from credible sources, such as a Flood Insurance Study or a signed and stamped engineering study.

C.1.7. SUBAPPLICATION SUBMISSION REQUIREMENTS

When using the BCA Toolkit to demonstrate cost-effectiveness, FEMA requires the submission of:

- The exported BCA file or Excel template file for the project.
- The BCA report pdf file for the project.
- All supporting documentation for the values entered in the BCA Toolkit.

For HMGP and HMGP Post Fire, the BCA documentation is required prior to FEMA approval. For BRIC and FMA, the BCA documentation is required at the time of subapplication submission unless otherwise specific in the NOFO.

If BCA file submission requirements change due to a version or platform update, the information will be reflected on the FEMA "Benefit-Cost Analysis" webpage.

D. Other Considerations

D.1. Aggregation of Benefits

Aggregation of benefits is when the benefits and costs of two or more individual structures or project components (referred to as mitigation actions in the BCA Toolkit) are strategically combined to create an average or composite BCR for a mitigation project overall. This approach allows individual structures or project components that are not cost-effective on a stand-alone basis to borrow excess benefits from cost-effective project elements or structures. Aggregation of benefits aims for optimal risk reduction while retaining project cost-effectiveness with an average BCR greater than or equal to 1.0.

An evaluation of the cost-effectiveness of a project should include all mitigation activities contained in the project application's scope of work. This may include various activities in multiple jurisdictions. It may also include combining benefits derived from mitigation activities associated with multiple hazards, such as wind and flood, if part of the same project. Aggregation of benefits must occur within the same HMA program and within a single subapplication (i.e., a subapplication is typically composed of multiple properties or sites and/or project types).

It is appropriate to aggregate benefits when the projects and groups within them are related in some aspect, and the project's BCR will be greater than or equal to 1.0 because of aggregating benefits. Based on these criteria, many HMA projects could gain an advantage through the aggregation of benefits, although some project types, such as the aggregation of benefits in property acquisition and structure demolition projects, present more obvious opportunities than others. If the overall BCR of an aggregated project is greater than or equal to 1.0, the project is deemed cost-effective and meets the regulatory requirements under the Robert T. Stafford Disaster Relief and Emergency Assistance Act.[190]

The purpose of the aggregation of benefits is to increase the number of cost-effective mitigation projects to maximize risk reduction in hazard-vulnerable communities. HMA encourages the consideration of aggregating benefits, as aggregation allows applicants and subapplicants to mitigate a greater number of structures or a larger area of the community than if each structure or project component were analyzed separately. In other words, aggregation of benefits expands opportunities for cost-effective mitigation by efficiently distributing all existing project benefits and not leaving potential benefits on the table.

Aggregation of benefits can be implemented across jurisdictional boundaries such as county lines, state lines and watershed boundaries. Aggregation of benefits can also take place across different project types, such as aggregation of benefits for a project combining structure elevation and wind retrofit, or flood and seismic retrofits. While aggregation of benefits across multiple hazards is less common, this form of aggregation is allowable if the BCA is deemed cost-effective. Applicants and subapplicants must maintain complete documentation for each structure included in the aggregation.

While undertaking aggregation of benefits is highly encouraged, there is a potential for increased administrative oversight and project management as projects increase in complexity and geographic extent. This complexity may be further increased when working across jurisdictional boundaries or project types.

Applicants and subapplicants may use project scoping/advance assistance, management costs or technical assistance funding to help address administrative and project management challenges.

[190] Public Law 100-707 (Nov. 23, 1988); amending the Disaster Relief Act of 1974, Public Law 93-288 (May 22, 1974)

The FEMA BCA Helpline can also provide support and guidance with questions regarding the aggregation of benefits.

D.1.1. AGGREGATION OF PRE-CALCULATED BENEFITS – MULTIPLE PROPERTIES WITHIN A SUBAPPLICATION

Subapplications may include multiple properties that use different approaches to demonstrating cost-effectiveness. Using a hybrid approach, the subapplicant may choose a subset of properties to which to apply pre-calculated benefits. The average cost of these properties must be below the designated pre-calculated benefit amount. The subapplicant would then analyze the remaining properties using the BCA Toolkit (or other FEMA-approved methodology), and the project costs and benefits for this subset would be aggregated to develop a composite BCR, which must be greater than or equal to 1.0. The application of excess benefits from the pre-calculated structures cannot be applied to the structure(s) being analyzed with the BCA Toolkit or any other FEMA-approved method.

D.2. Phased Projects

Phased projects are allowed under the HMGP, HMGP Post Fire, BRIC and FMA programs, and require a BCA for Phase I and Phase II. The purpose of phased projects is to provide assistance for design, engineering, environmental and historic preservation (EHP), or feasibility studies or analysis on a proposed project during Phase I. For this reason, BCAs for the Phase I subapplications should be based on the best available data and include a detailed explanation of any assumptions that went into the BCA, including any assumptions about after-mitigation (residual) damage. Phase I approval does not guarantee approval of future phases. After Phase I is completed, FEMA will complete an eligibility review that includes a cost-effectiveness determination to evaluate if the project meets all eligibility requirements to proceed to Phase II. BCAs should incorporate data from the Phase I deliverables/analysis and must reflect current site conditions and all revisions to scope and cost made to the project following Phase I analysis.

Cost-Effectiveness Resources

- OMB Circular A-94: *Guidelines and Discount Rates for Benefit-Cost Analysis of Federal Programs:* https://www.whitehouse.gov/wp-content/uploads/legacy_drupal_files/omb/circulars/A94/a094.pdf
- FEMA BCA: https://www.fema.gov/grants/guidance-tools/benefit-cost-analysis
- FEMA BCA Toolkit: https://www.fema.gov/grants/guidance-tools/benefit-cost-analysis/full-bca#download

Part 6. Application and Submission Information

This part provides information to HMA recipients and subrecipients about application requirements and the process for submitting applications. The following information is intended for guidance only and is not a request for information.

A. General Application and Subapplication Principles

For a subapplication to be eligible for Hazard Mitigation Assistance (HMA), the subapplicant and the applicant must provide the appropriate documentation, in the correct format, to establish eligibility. Eligibility is discussed in detail in Part 4 and subapplication considerations and project scoping are discussed in Part 3.

Subapplication packages are available from eligible applicants. The applicant selects and prioritizes subapplications and submits them to FEMA. HMA applications are processed through an electronic application system. The system generally encompasses the entire application process and provides the means to electronically create, review and submit an assistance application in a digital format. The applicant is required to use the electronic application system.

For the Hazard Mitigation Grant Program (HMGP) and Hazard Mitigation Grant Program Post Fire (HMGP Post Fire), the applicant may submit a single application representing all subapplications, or they may submit multiple applications. When multiple subapplications are submitted, they should be ranked in priority order. Application instructions for Building Resilient Infrastructure and Communities (BRIC) and Flood Mitigation Assistance (FMA) may be found in the appropriate year's Notice of Funding Opportunity (NOFO).

Applications and subapplications submitted to FEMA must meet all program eligibility criteria outlined in the law, regulations and the HMA Guide. FEMA does not accept incomplete or placeholder applications or subapplications. Incomplete applications or subapplications delay award or subaward approval if they do not contain sufficient information for FEMA to make a program eligibility determination.

If the subapplication is deficient, the applicant may revise or augment the subapplication in consultation with the subapplicant. Applicants must certify that they have evaluated the activities included in each subapplication and that activities will be implemented in accordance with applicable activity-type and program requirements.

Before forwarding subapplications to FEMA, applicants must review subapplications to document that:

- All program-specific and activity-specific requirements have been met and are documented, as appropriate.
- The subapplicant has documented its ability to manage the subaward assistance.
- The subapplicant has documented its ability to complete the mitigation activity in the time specified.
- Non-federal cost share assistance is available and will remain available for the total duration of the subaward's period of performance.
- The maintenance requirements have been sufficiently identified, and the subapplicant or another authorized entity has accepted the maintenance responsibility.
- The underlying cost-effectiveness data are accurate and complete.
- The application includes necessary Office of Management and Budget (OMB)-approved forms, where required.

FEMA will only consider applications and subapplications submitted to a specific HMA program. If an applicant would like to have a subapplication considered under multiple HMA programs, the applicant must submit that subapplication to each HMA program separately. If selected, applications will only be funded under one program.

For more information, applicants should contact the appropriate FEMA regional office. For information on FEMA contacts, refer to Part 15.

B. Application Package and Submission

B.1. Grants.gov Registration

Before applying for HMA, applicants and subapplicants must complete preliminary steps required to receive any federal funding. Applicants and subapplicants must complete a grants.gov registration (including registering with the System for Award Management) by visiting the grants.gov registration website. Applicants and subapplicants with existing registrations should verify their information is current and correct. Registration should remain current through the application period and period of performance.

B.2. Electronic Grants Management Systems

The FEMA Grants Management Modernization Initiative is modernizing and consolidating FEMA's grants management systems by moving away from using multiple systems (e.g., National Emergency Management Information System [commonly known as NEMIS] and eGrants). The previous grants systems' functionalities and business processes will continue to be updated and developed in the

new system, FEMA Grants Outcomes (FEMA GO), and the legacy systems will be decommissioned once FEMA GO is at full operating status across all of FEMA's grant programs.

FEMA GO allows users to apply, track and manage all disaster and non-disaster grants by performing all business functions that fall within all five phases of the grants management lifecycle: pre-award, award, post-award, closeout, and post-closeout. It also improves oversight and monitoring. For more information, refer to the "FEMA Grants Outcomes (FEMA GO)" webpage. To resolve any technical issues, contact the FEMA GO Help Desk at 1-877-585-3242 or femago@fema.dhs.gov.

B.3. Application Documentation and Assurance Forms

For FEMA to approve a subapplication, the subapplicant and the applicant must submit the necessary documentation. If an application lacks the eligibility information required, FEMA cannot determine eligibility and approve the application. If information is lacking, FEMA may request additional information during the review process.

The following documentation, which is needed to demonstrate eligibility, should be contained in the subapplication and application. Criteria may vary depending on the proposed activity, but applications/subapplications generally include all the elements below:

- An eligible applicant and subapplicant.
- Identification of mitigation activity.
- Consistency with FEMA-approved mitigation plans.[191]
- A scoping narrative that describes the proposed activities and their outcomes and contains the following:
    - Detailed scope of work that establishes the desired level of protection and/or risk reduction and describes the steps to complete the mitigation activity.
    - Work schedule demonstrating that the activity will be completed within the period of performance for the applicable program (refer to Part 8.G).
    - Budget that supports the scope of work, including the schedule, and reflects the total activity cost.
    - Cost share information that clearly identifies the source of the non-federal cost share and establishes that the non-federal cost share meets program eligibility requirements.
    - Cost-effectiveness information (refer to exceptions in Part 5).

[191] 44 Code of Federal Regulations (CFR) § 206.434(c)(1)

  - Feasibility and effectiveness information (mitigation project types only).
  - Environmental and historic preservation (EHP) compliance documentation as required by EHP guidance (refer to the FEMA "Environmental and Historic Preservation Grant Preparation Resources" webpage for the EHP Compliance Checklist).

- SF-424 Family of Forms, as applicable:
  - Application for Federal Assistance (SF-424).
  - Budget Information for Non-Construction Programs (SF-424A).
  - Assurances for Non-Construction Programs (SF-424B).
  - Budget Information for Construction Programs (SF-424C).
  - Assurances for Construction Programs (SF-424D).
- SF-LLL, "Disclosure of Lobbying Activities."
- Additional documentation, as required by FEMA.

Recipients are required to use FEMA's electronic application systems as indicated by the guidance or program NOFO. For HMGP, alternative methods may be used if they are approved by FEMA in the recipient's HMGP Administrative Plan.

The above information, collections and forms have been incorporated into FEMA's electronic application systems. FEMA reviews forms as often as required by OMB or more frequently if program statutes or regulations require updates. FEMA will publish updated forms on fema.gov and in electronic application systems.

B.4. Other Required Content

Supporting documentation that cannot be electronically attached to the application (e.g., engineering drawings, photographs, maps) must be submitted to the appropriate FEMA regional office. The entire application and all supporting documentation must be received by the appropriate FEMA regional office no later than the application deadline.

If a subapplicant does not use the electronic application system, the applicant must enter the paper subapplication(s) into the system on the subapplicant's behalf prior to the application deadline.

B.5. Intergovernmental Review

Executive Order (EO) 12372 on *Intergovernmental Review of Federal Programs* (July 14, 1982) fosters intergovernmental partnership and strengthens federalism by relying on state and local processes for the coordination and review of proposed federal financial assistance and direct federal

development. The executive order allows each state to designate an entity to perform this function. If required by state or local law, the applicant must follow the procedures outlined in the state or local intergovernmental review.

Applicants may need to allow additional time for the intergovernmental review process. If an applicant has chosen not to participate in the intergovernmental review process, the application may be sent directly to FEMA.

Applicants should contact the state single point of contact to determine whether the application is subject to the state intergovernmental review process. After confirming the program's intergovernmental review eligibility, the applicant must indicate if the application is subject to review on SF-424, *Application for Federal Assistance*.

For more information about intergovernmental review, refer to 44 Code of Federal Regulations (CFR) Part 4.

B.6. Application Submission

Submission dates and times generally vary by program. More details are outlined in the sections below.

B.6.1. HAZARD MITIGATION GRANT PROGRAM APPLICATION SUBMISSION

HMGP submission deadlines for applications are established by FEMA based on the major disaster declaration date. The recipient should submit all subapplications within 12 months of the date of the major disaster declaration.[192] Subapplications must include all costs for the proposed mitigation activity including subrecipient management costs.

The recipient may submit a written request to extend the application period if the application period has not yet expired. The recipient must include a justification in its request. The regional administrator may extend the application submission timeline in 30- to 90-day increments (not to exceed a total extension of 180 calendar days) if extraordinary conditions occur.[193]

FEMA encourages recipients to submit subapplications in excess of available assistance, as subapplications must be submitted within the application period to be considered for assistance.

The excess subapplications can be considered after the application period has closed (and the period of performance is open) when:

- FEMA increases the HMGP ceiling.

[192] 44 CFR § 206.436(d)
[193] 44 CFR § 206.436(e)

- Other subapplications are found ineligible or are withdrawn.
- There are cost underruns after the closeout of approved subapplications.

Subapplications submitted in excess of available assistance should also include associated management costs, as management costs requests must also be submitted within the application period.

FEMA may extend the application period beyond 180 calendar days based on meeting the criteria of Section 301 of the Robert T. Stafford Disaster Relief and Emergency Assistance Act (Stafford Act).[194] Section 301 of the Stafford Act provides relief for the rare and extraordinary circumstance when the magnitude of the event for which the extension is requested prevents the recipient from meeting program administrative requirements. These requests will be considered on a case-by-case basis. At a minimum, the request must describe the conditions that preclude the recipient from meeting the administrative requirements and must include a summary of current status, planned actions to meet the extension, and any resources that may be required.

The FEMA region submits the request and its recommendation to the Mitigation Directorate for final action. If the application deadline occurs while FEMA is reviewing a request, this will not preclude FEMA from granting the extension. For more information on HMGP, refer to Part 10.

B.6.2. HAZARD MITIGATION GRANT PROGRAM POST FIRE APPLICATION SUBMISSION

States, federally recognized tribes and territories that are affected by fires and receive a Fire Management Assistance Grant (FMAG) declaration are eligible to apply for HMGP Post Fire. The application period opens with the state or territory's first FMAG declaration of the fiscal year and closes six months after the end of that fiscal year. The regional administrator may grant up to two 90-day extensions. Additional extensions must be requested from the region and approved by the deputy associate administrator for mitigation. FEMA will send a formal assistance notification letter to eligible applicants with the first and each subsequent FMAG declaration.

B.6.3. BUILDING RESILIENT INFRASTRUCTURE AND COMMUNITIES PROGRAM AND FLOOD MITIGATION ASSISTANCE APPLICATION SUBMISSION

Application submission due dates and times are noted in the NOFO posted on grants.gov. Subapplicants should consult the official designated point of contact for more information regarding the application process and deadlines.

[194] Public Law 100-707 (Nov. 23, 1988); amending the Disaster Relief Act of 1974, Public Law 93-288 (May 22, 1974); 42 United States Code (U.S.C.) § 5141

C. Scoping Narrative: Scope of Work, Schedule and Budget

Each subapplication must include a scoping narrative, which is a description of the proposed activities and anticipated outcomes, as a means for FEMA to determine whether the activities are eligible, whether the applicant can complete the activities within the period of performance and whether the proposed costs are reasonable.

The scoping narrative stipulates the deliverables, identifies the tasks required to complete the proposed activity, and defines the tasks to be accomplished in clear, concise and meaningful terms. It typically consists of the scope of work, schedule and budget. All activities must be identified in the scoping narrative prior to the close of the application period. The scoping narrative becomes part of the conditions of the award.

C.1. Scope of Work

The following components may be included in the scope of work. Required information may vary between construction and non-construction activities.

C.1.1. INTRODUCTORY STATEMENT

The scope of work starts with a short statement that describes the proposed activity and what will be accomplished by the end of the period of performance.

C.1.2. ACTIVITIES DESCRIPTION

The scope of work describes the proposed approach, outcomes and level of effort, including key milestones and schedule, and each activity's relationship to the budget. The description explains how the outcome will be reached and identifies the responsible party for each task.

Other considerations that should be addressed in the activities description:

- **Geographic area(s) description and location**: Provide geographic information about the mitigation activity being scoped. The description of the geographic area(s) may vary based on the mitigation activity proposed and may be site specific (i.e., address and latitude/longitude to the nearest sixth decimal place) or include a description of the general area served by the proposed activity. Enter geospatial coordinates into the location section of the subapplication.

- **Hazard source(s)**: The hazard source(s) refers to the hazard type(s) that will be mitigated by the mitigation activity being scoped. Identify the hazard type(s) that will be mitigated by the mitigation activity being scoped.

- **Population affected**: Identify the percentage of the population that will be affected by the proposed project. The number of people who will benefit from the proposed activity should

be known for the scope of work. Divide this number by the total population to determine the percentage.

- **Need for the proposed project**: Describe past event(s) and damage history or risk assessment, if applicable. Explain how the proposed project will mitigate such damage or risk.

- **Describe how the mitigation activity will be completed**: Explain the process that the subapplicant will follow to complete the mitigation activity. Describe the proposed activities, including the desired level of protection and/or risk reduction, and define tasks to be accomplished. The scope of work should include key milestones. Explain who will complete the work. Include information about the procurement process that the subapplicant will follow, if applicable. Explain the proposed outcomes or deliverables. Proposed conceptual designs must be provided either through an identified industry standard or through project plans and specifications.

  For non-construction activities, describe existing operations and what gaps the mitigation activity is expected to address. For construction projects, describe the project site and conditions. If retrofit projects are proposed, describe how the project will tie into existing structures or facilities.

- **Technical feasibility and effectiveness (for construction subapplications)**: Technical feasibility refers to the extent that the completed project will mitigate damage and losses as claimed in the subapplication. Demonstrating technical feasibility often requires providing technical documentation, which requires consultation with design professionals such as professional engineers and licensed architects. Technical documentation may be attached to the subapplication.

  - Engineering design documentation demonstrates how the proposed project will reduce risk after it is completed. Documentation may include preliminary schematic or engineering drawings, a clear explanation of design parameters that will be followed, and the level of protection. Any engineering practices or best practices proposed in the design should be explained.

  - For certain hazard types, FEMA developed design standards that must be followed for a project to be considered eligible.

  - Technical feasibility should explain any required building codes or construction codes and standards.

- **Describe who will manage the mitigation activity**: Explain how the mitigation activity will be managed and who is responsible for completing the project. Explain whether existing or hired staff will be used.

- **Project alternatives**: For construction projects, multiple mitigation project alternatives are required as part of the subapplication. Indicate at least three alternative actions:
  - No action alternative and its consequences.
  - Alternative that was selected and why.
  - Alternative(s) that was considered but not selected and why.

  The selected action alternative should pertain to the project proposed in the subapplication. Explain why it is the most practical, effective and environmentally sound alternative.

- **Long-term maintenance**: Long-term maintenance helps to ensure that a mitigation project will remain effective at reducing risk beyond its initial construction and into the future. Certain types of projects will require an operations and maintenance plan. Name the entity that will perform the long-term maintenance and provide a schedule and cost information. Information on maintenance costs is likely to be contained in documentation used in the Benefit-Cost Analysis.

- **Alignment with hazard mitigation plan**: Explain how the mitigation activity is consistent with the approved local or tribal mitigation plan.

- **Management costs to support grants management activities**: Describe whether the subapplicant will manage the subaward with internal staff or intends to hire a contractor/consultant to manage the effort. This item refers to the oversight of the subaward and not to the oversight of the project construction. For more information, refer to Part 13.

- **Deviations from standard procedures**: Deviations from standard procedures, methods, techniques, and technical provisions of the applicable codes or best practices must be thoroughly explained and documented to determine eligibility and feasibility.

- **Mitigation activity components**: Activity-specific guidance is provided in Part 11, Part 12 and Part 13. Applicants should review the guidance to determine what elements should be addressed in the scope of work narrative.

- **Past assistance description**: The description should summarize past assistance provided to develop subapplication and activity work plans and specifications (such as project scoping/advance assistance).

C.1.3. PERSONNEL

The scope of work narrative identifies proposed staff and personnel requirements, describes relevant experience in managing proposed activities of federal awards, and identifies planned use of contractors and consultants.

C.1.4. TASK MANAGEMENT

The scope of work narrative describes the methods the subapplicant will use to manage the tasks and contractors as well as to monitor and report on progress, including proposed accountability measures.

C.1.5. RANKING FACTORS

The scope of work explains how the activities will address the goals and objectives or ranking factors of the relevant HMA program. For BRIC and FMA, FEMA will identify assistance priorities in the NOFO announcement. For HMGP and HMGP Post Fire, the recipient may identify assistance priorities.

C.2. Schedule

The schedule includes all tasks identified in the scope of work and the relationship of each activity for the budget. The schedule identifies major milestones with target dates for meeting each milestone, including anticipated quarterly usage of federal assistance. Proposed schedules must not exceed the period of performance for the award. The applicant and subapplicant must provide sufficient detail so that FEMA can determine whether the proposed activities can be accomplished within the period of performance.

The schedule should specify the duration of each process component required to complete the project. Although the components' occurrences are not necessarily sequential and activities may be carried out concurrently, the total timeline cannot exceed the period of performance.

C.3. Budget

The budget should match the proposed level of effort from the scope of work and work schedule.

All cost elements must match tasks and provide sufficient detail for FEMA to determine whether the application is eligible. The budget should include consideration regarding cost share, pre-award costs, closeout, format and contingency costs. Note that ineligible formats, such as lump sum estimates, are not eligible and will not be accepted.

Budgets must include cost item categories such as personnel (labor) and fringe benefits, travel, equipment, supplies (materials), contractual, construction, other pre-award costs, contingencies, program income and management costs. The budget should be supported with a budget narrative and documentation to support the basis of the estimate and substantiate that the budget is reasonable. Costs must be in accordance with applicable cost principles.[195]

The budget is essential for understanding if the requested costs are allowable (allocable, necessary and reasonable).

[195] 2 CFR Part 200, Subpart E.

C.3.1. BUDGET DOCUMENTATION

The budget documentation should indicate the method(s) used to determine the mitigation activity costs (e.g., the estimate was prepared by a consultant, previous assistance was used to inform the estimate).

Costs must be associated to each applicable cost category(s). All costs must be detailed and not contain lump sums. The budget must include a line-item breakdown of costs consistent with all elements described in the scope of work and schedule information.

Subapplicants should provide a budget narrative with explanations, justifications and line-item details of the costs. The budget narrative should explain how costs were derived and include details not in the line items.

The budget generally includes:

- **Personnel (labor) and fringe**: The number of personnel, number of hours per quarter, average pay rate and fringe benefit rates.
- **Travel**: A breakdown of travel costs, such as the type of transportation, lodging, mileage, per diem rates and estimated description of travel needs. Describe the travel involved and its purpose and explain how the proposed travel is necessary for the activity. If travel details are unknown, explain the basis for proposed costs. Lump-sums will not be accepted.
- **Equipment**: A list of equipment and the intended use of the equipment.[196] Provide a lease versus purchase analysis for each item with a value greater than the recipient's or subrecipient's capitalization level or $5,000, whichever is more restrictive.[197] Provide a copy of each rental agreement and pricing.
- **Supplies/materials**: A unit cost estimate for each major component or element.[198]
- **Contractual support**: The estimate must be supported by a method of selection (e.g., competitive, sole source with justification, sealed bids, small purchase or micro-purchase), request for proposal/scope of work, period of performance, criteria for measuring accountability, bid documents or contract. If bids have not been received, the applicant/subapplicant may submit an independent cost estimate.
- **Construction**: The estimate should include administrative and legal expenses; land, structure, right-of-way and appraisals; relocation expenses and payments; architectural and

[196] Refer to 2 CFR § 200.1 for the definition of equipment.
[197] 2 CFR § 200.318(d)
[198] Refer to 2 CFR § 200.1 for the definition of supplies.

engineering fees; inspection fees; site work; demolition and removal; and other construction costs.

- **Other**: Information in narrative form on how costs were identified.
- **Pre-award**: All pre-award costs must be noted in separate line items—including the date the cost was incurred and a narrative description of the task completed. For more information regarding pre-award costs, refer to Part 3.
- **Contingencies**: An allowance in the total budget to cover situations that cannot be fully defined when the budget is prepared but that will likely result in additional eligible costs. If contingency costs are requested, include them as a line item in the budget section of a subapplication. As with other line items in the budget, the subapplicant should justify the contingency estimate based on the nature of the proposed activity. For more information regarding contingencies, refer to Part 8.
- **Program income**: Anticipated program income must be identified in the budget.[199]
- **Management costs**: Direct administrative and indirect costs are only eligible as management costs. Subrecipients must identify management costs in the budget as a separate line item, supported by a schedule and narrative describing personnel and fringe benefits, travel, equipment, supplies, contractual, indirect costs and other management costs expenses.
- **Strategic funds management**: For activities greater than or equal to $1 million, strategic funds management or incremental assistance applies. For details on strategic funds management, refer to Part 8. Both the activity and management costs are subject to strategic funds management requirements. The applicant or subapplicant must develop their financial plan along with the work schedule for the mitigation activity by budget (or fiscal) year and include a roll-up of all budget years. The schedule and applicable budget year budget should support incremental obligations as each activity milestone is reached. If the applicant or subapplicant determines that strategic funds management is not feasible for the activity, a narrative explaining the rationale shall be provided.

In addition to the budget, the applicant must identify the cost categories and value for anticipated cash and third-party in-kind contributions for meeting the non-federal cost share.

FEMA accepts estimated costs when they are:

- Prepared by a licensed professional engineer or other estimating professional, such as a licensed architect or certified professional cost estimator, who certifies that the estimate was prepared in accordance with industry standards.

[199] Refer to 2 CFR § 200.1 for the definition of program income.

- Based on unit costs for each component of the scope of work and not a lump-sum amount.
- Of sufficient detail for FEMA to validate that all components correspond with the scope of work.
- Based on the current phase of design or construction inclusive of any known costs.
- Inclusive of actual costs for work completed at the time the cost estimate is developed.
- Reasonable.

When estimated cost data does not provide enough detail for FEMA to complete an analysis, the agency may issue a Request for Information (RFI) to the applicant for additional information or clarification.

C.3.2. NON-FEDERAL FUNDING SHARE

The budget must include a list of all sources and amounts used in the non-federal share, including all third-party in-kind contributions.[200] FEMA will not reimburse any in-kind contributions above the required non-federal share. If any portion of the non-federal share comes from nonapplicant sources (e.g., donated services, private donation), the applicant must attach letters of funding commitment for each non-applicant source.[201]

D. Cost-Effectiveness Documentation

For details on cost-effectiveness documentation (for mitigation project types only), refer to Part 5.

E. Feasibility and Effectiveness Documentation

FEMA will use the information provided in the subapplication—including the scope of work, the budget and supporting documentation—to determine the feasibility and effectiveness of the proposed mitigation project (for mitigation project types only).

FEMA accepts the engineering design for a project if a licensed professional engineer (or other professional licensed by the state to practice in the discipline being certified by the individual) certifies that the design meets the appropriate code or industry design and construction standards. FEMA will accept the certified engineering design in lieu of a comprehensive technical feasibility review. Specific design and construction standards are included by project type in Part 12. If accepted codes/standards are used, no additional documentation is required. The application must

[200] Refer to 2 CFR § 200.1 for the definition of third-party in-kind contributions.
[201] 2 CFR § 200.306

include the codes or standards that will be used for the design and the version and date of the codes or standards used.

If an alternative design is proposed, the application and subapplication should contain:

- Applicable building code/edition or engineering standard used.
- Level of protection provided by the proposed project and description of how the proposed activity will mitigate future losses.
- For the retrofit of existing buildings or infrastructure protection projects, an assessment of the vulnerabilities of the existing building.
- Any remaining risk to the structure after project implementation.
- Proposed schematic drawings or designs (as applicable).

Project subapplications lacking the appropriate documentation to support the determination of feasibility and effectiveness may be removed from consideration. Upon request, FEMA will provide technical assistance regarding engineering documentation.

If future conditions such as climate change–related factors (e.g., sea level rise or increased precipitation) are included in the analysis, the studies or reports documenting the increased risk and how it was applied to the project design must be included and document how the project effectiveness was calculated.

F. Environmental and Historic Preservation Documentation

Applicants and subapplicants are required to provide information to support the FEMA EHP compliance review. FEMA, in consultation with appropriate federal and state resource agencies, will use the information provided in the application/subapplication, including the scope of work and project budget, as well as any supporting documentation, to ensure compliance with EHP requirements.

FEMA reviews the completeness of the responses to the questions in the EHP review section of the project subapplication and any supporting documentation. HMA project subapplications must include the required information for each property identified in the subapplication and a detailed scope of work. Information needs include clearly labeled maps, photographs of buildings, ages of all buildings and structures, and copies of any coordination letters with other agencies. FEMA uses this information to complete and document the EHP review process. A lack of information may delay the identification of outstanding EHP compliance requirements and project implementation. Also, failing to provide the required information by the application deadline may prohibit FEMA from making an award or subaward.

F.1. Environmental and Historic Preservation Checklist

The applicant and subapplicant should ensure the project scope of work considers all potential EHP compliance issues and costs. To assist in preparing the subapplication, the applicant/subapplicant must complete the EHP Checklist and provide information and documentation about potential impacts on the pertinent environmental and cultural resources in the project area. The documents on the FEMA "Environmental & Historic Preservation Grant Preparation Resources" webpage detail the information the agency needs to carry out an EHP review by project type. Any relevant information, surveys or studies related to EHP considerations identified and addressed in previous project planning activities should also be provided and may be used to satisfy the EHP compliance requirements at FEMA's discretion.

Using the EHP Checklist, the applicant/subapplicant will identify applicable information that must be provided to FEMA, such as a complete scope of work narrative, documentation, maps, studies or correspondence related to:

- **Biological resources**: Any identified federally listed threatened and endangered species and/or designated critical habitats potentially affected by the proposed project.
- **Water and biological resources**: Vegetation, including amount (area), type and extent to be removed or affected.
- **Water resources**: Identification of all surface waters in the project area regardless of drainage area, size or perceived hazard level. Information about surface waters should include dimensions, the proximity of the project activity to the water and the expected and possible impacts of the proposed project on surface waters, if any.
- **Coastal resources**: Indication of whether the proposed project is located in a state's designated coastal zone or within a Coastal Barrier Resource System Unit or Otherwise Protected Area.
- **Pollution control and debris management**: Identification of any hazardous or toxic materials that will affect the project, including studies, investigations or enforcement actions related to the proposed project's location.
- **Socioeconomic and/or environmental justice requirements**: A description of any socioeconomic effects, including disproportionately high and adverse effects on low-income or minority populations (i.e., communities with environmental justice concerns) in the proposed project area.
- **Historic or cultural resources**: The property address; the original date of construction; and at least two color photographs for any buildings, structures, objects, or man-made site/landscape features 45 years or older in age. At least one of the two photographs of a building should be the front or primary façade showing the building's entire elevation.

The EHP Checklist in Table 7 outlines necessary items for EHP compliance. Additional items may be required. Any items marked with a "yes" in the EHP Checklist must be further described in the project subapplication. This checklist has been incorporated into the electronic application system for BRIC and FMA. For the most current information, refer to the FEMA "Environmental & Historic Preservation Grant Preparation Resources" webpage.

Table 7: Environmental and Historic Preservation Checklist

	Environmental Regulation or Statute	Yes	No
	National Historic Preservation Act		
1.A	Would the proposed project affect, or is the proposed project near, any buildings or structures 45 years or more in age?		
1.B	Will the proposed project involve disturbance of ground?		
	Endangered Species Act		
2.A	Are federally listed or endangered species, or their critical habitat, present in or near the project area and, if so, which species are present?		
2.B	Will the proposed project remove or affect vegetation?		
2.C	Is the proposed project in, near (within 200 feet), or likely to affect any type of waterbody or body of water?		
	Clean Water Act and Rivers and Harbors Act		
3.A	Will the proposed project involve dredging or the disposal of dredged material, excavation, the addition of fill material, or result in any modification to water bodies or wetlands designated as "waters of the United States" as identified by the U.S. Army Corps of Engineers or any water bodies or wetlands in the National Wetland Inventory?		
	Executive Order 11988 (*Protection of Floodplains*) and Executive Order 11990 (*Protection of Wetlands*)		
4.A	Does a Flood Insurance Rate Map, Flood Hazard Boundary Map, hydrological study or some other source indicate that the project is located in or will affect a 1% annual chance floodplain, a 0.2% annual chance floodplain (if a critical action), an identified regulatory floodway or an area prone to flooding?		
4.B	Is the proposed project located in, or will it affect, a wetland as listed in the National Wetland Inventory?		
4.C	Will the proposed project alter a watercourse, water flow patterns, or a drainage way, regardless of its floodplain designation?		
4.D	Is the proposed project located in, or will it affect, a floodplain or wetland? If yes, the eight-step process summarized in HMA job aids must be completed.		

	Environmental Regulation or Statute	Yes	No
	Coastal Zone Management Act and Coastal Barrier Resources Act		
5.A	Is the proposed project located in the state's designated coastal zone?		
5.B	Is the proposed project located in a Coastal Barrier Resources System Unit or Otherwise Protected Area?		
	Farmland Protection Policy Act		
6.A	Will the proposed project convert more than five acres of "prime or unique" farmland outside city limits to a non-agricultural use?		
	Resource Conservation Recovery Act and Comprehensive Environmental Response, Compensation, and Liability Act		
7.A	Is there reason to suspect there are contaminants from a current or past use on the property associated with the proposed project?		
7.B	Are there are any studies, investigations or enforcement actions related to the property associated with the proposed project?		
7.C	Will any project construction or operation activities involve the use of hazardous or toxic materials?		
7.D	Are any of the current or past land uses of the property associated with the proposed project or are any of the adjacent properties associated with hazardous or toxic materials?		
	Executive Order 12898 (*Environmental Justice for Low Income and Minority Populations*)		
8.A	Are there any low-income or minority populations in the project's area of effect or adjacent to the project area?		
	Other Environmental/Historic Preservation Laws (Including Applicable State Laws) or Issues		
9.A	Are other environmental/historic preservation requirements associated with this project?		
9.B	Are any controversial issues associated with this project?		
9.C	Have any public meetings been conducted, or public comment solicited, on the proposed project?		

FEMA may identify additional EHP compliance review activities necessary to facilitate project approval, such as the completion of environmental assessments, environmental impact statements, Phase I environmental site assessments, biological assessments, archeological or standing structures surveys and documentation, wetlands delineations, and air quality conformity analyses or determinations. The *Section 106 Process under the National Historic Preservation Act* FEMA job aid describes specific decision points made by FEMA during the Section 106 review process. The *NEPA Flowchart for HMA Projects* FEMA job aid describes how FEMA decides if an environmental

assessment or an environmental impact statement is needed for compliance with the National Environmental Policy Act.[202]

Unanticipated costs and delays may occur if, during the formal EHP compliance review, FEMA identifies an award condition (e.g., acquiring permits, timing restrictions) or scope change necessary for the project to remain in compliance with EHP laws or determines that a project will adversely impact an environmental or cultural resource. FEMA resolves adverse impacts to environmental or cultural resources through consultation processes that may involve federal and state agencies, federally recognized tribes and/or external stakeholders. The exact outcome of the consultation, and therefore the costs and time to resolve the impacts, will not be known until after project selection and consultation have concluded. The HMA programs have the discretion to determine, on a project-by-project basis, whether FEMA or the applicant and subapplicant will provide assistance for EHP mitigation measures to resolve adverse impacts.

Applicants and subapplicants may incur costs for significant EHP compliance review activities and/or EHP mitigation measures. FEMA will consider the following factors to determine whether to reimburse costs:

- Nature of the analysis or study required (e.g., environmental impact statement) and the degree to which the activity is related to accomplishing the mitigation goals.
- Costs of EHP activities compared to project costs.
- Complexity of the proposed project.
- Nature and extent of potential adverse impacts to environmental, cultural and/or historic resources.

Applicants should consider potential EHP costs during application development and submission and should seek to avoid activities that may negatively impact EHP resources.

FEMA may remove projects from consideration for full approval and/or assistance when EHP compliance review activities are not progressing and the applicant/subapplicant has not dedicated resources and/or provided required and requested documentation in a timely manner.

For more information, visit the FEMA "Environmental Planning and Historic Preservation" webpage, contact the appropriate FEMA regional office, or call the EHP Helpline (1-866-222-3580).

G. Requests for Information

If a subapplication does not meet the administrative or procedural information requirements, FEMA may request additional information in the form of a formal RFI. The request will detail additional

[202] Public Law 91-190 (Jan. 1, 1970), 42 U.S.C. § 4321

information or documentation needed to satisfy outstanding administrative, procedural, program, technical or EHP requirements. For BRIC and FMA, an RFI will not occur until after selection because of the competitive nature of the programs. RFIs can take various forms, including email requests, documented telephone calls or formal letters. Applicants are responsible for coordinating with the subapplicant to get the required information. Failure to provide the requested information by the final deadline identified in the request may result in denial if eligibility cannot be determined. Technical assistance may be available if requested.

G.1. Request for Information Timelines

Table 8 provides timelines for information requests and assistance offers. The subapplication review process involves an eligibility review to determine whether the subapplication and subapplicant are eligible. Then a completeness review is conducted to determine whether a complete subapplication was submitted. If the subapplication is determined to be incomplete, FEMA may request further information from the subapplicant.

At each step of the RFI subapplication review process, FEMA will work with the applicant to determine available options to develop a viable activity. Some options include technical assistance from FEMA or implementing a phased activity. If the FEMA regional administrator does not receive the requested information before the deadline, the activity may be denied, as the agency will have no basis to make an eligibility determination. Upon receipt of the requested information and confirmation that it adequately addresses the RFI, FEMA will determine activity eligibility.

Table 8: Request for Information Timelines

Request Format	Timeline
Informal – First Request	The FEMA project officer requests additional information from the applicant in writing. Unless the HMA program is competitive, FEMA may provide technical assistance, if requested, to help the applicant respond to the RFI and set a new time frame for the applicant's response. Depending on the HMA program, the applicant may consider phasing the project if it is feasible to do so. If the requested information is not received within 30 calendar days from the date of the request, FEMA will consider the application to be incomplete and not approvable and will proceed with the process below to send an informal second request.
Informal – Second Request	The FEMA hazard mitigation branch chief requests additional information in writing. If the requested information is not received within 14 calendar days from the date of the request, FEMA will consider the application to be incomplete and not approvable. FEMA may provide technical assistance, if requested, unless the HMA program is competitive. FEMA, recipient and applicant staff should meet to resolve any open items within the allotted time frame, if necessary.

Request Format	Timeline
Formal Request	In a formal letter to the applicant, the FEMA regional administrator requests additional information and documents previous requests. The information must be submitted within 30 calendar days.
Formal Denial	If the FEMA regional administrator does not receive the requested information from the formal request within 30 calendar days, FEMA considers the subapplication to be incomplete and therefore ineligible for assistance. FEMA sends a formal denial letter at that time.

If the FEMA regional administrator determines additional time is needed to address the requirement, they may choose to allow more time for an RFI. FEMA encourages subapplicants to coordinate early with the applicant to identify potential technical assistance needs. If technical data is not readily available, the subapplicant should coordinate with the applicant to determine whether the project should be phased to develop the required data. Applicants may contact their FEMA regional office to request technical assistance, relevant training or other needed support.

The Request for Information process is outlined in Figure 6.

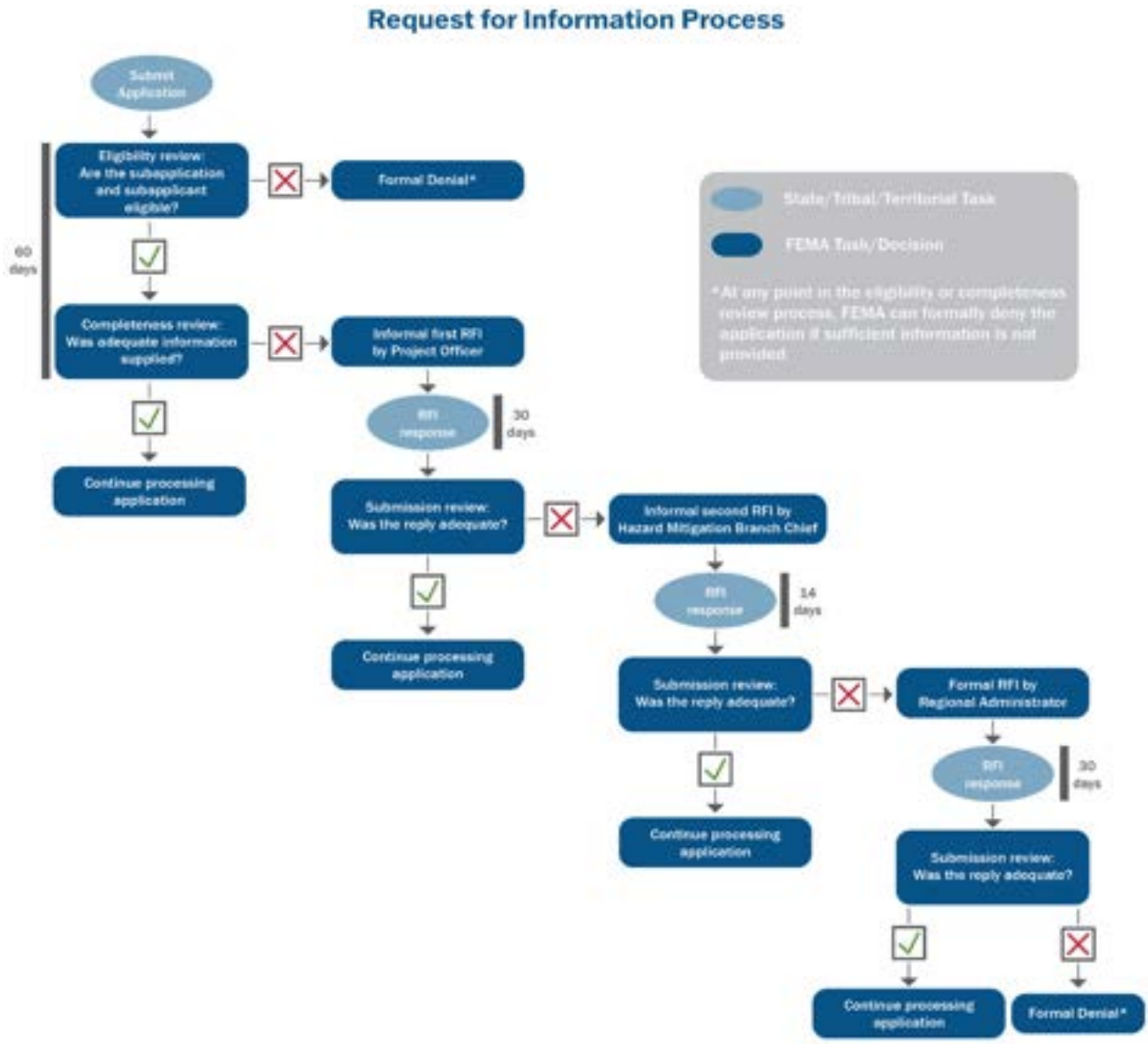


Figure 6. Request for Information Process Flowchart

Application and Submission Information Resources

- Grants.gov registration: www.grants.gov/web/grants/register.html
- FEMA GO: https://www.fema.gov/grants/guidance-tools/fema-go
- SF-424, *Application for Federal Assistance* https://www.grants.gov/forms.html
- State Single Point-of-Contact List: https://www.whitehouse.gov/wp-content/uploads/2020/04/SPOC-4-13-20.pdf
- Environmental & Historic Preservation Guidance for FEMA Grant Applications: https://www.fema.gov/grants/guidance-tools/environmental-historic
- Environmental & Historic Preservation Grant Preparation Resources: https://www.fema.gov/grants/guidance-tools/environmental-historic/preparation-resources

Part 7. Award Selection and Notification

A. Award Selection

Applicants select the subapplications to submit to the Federal Emergency Management Agency (FEMA). FEMA only reviews subapplications submitted by the applicant. For the Hazard Mitigation Grant Program and the Hazard Mitigation Grant Program Post Fire program, subapplications are reviewed on a continuous basis and are awarded if eligible. The evaluation criteria and review processes for Building Resilient Infrastructure and Communities (BRIC) and Flood Mitigation Assistance (FMA) programs are outlined in their yearly Notice of Funding Opportunity (NOFO).

B. Applicant Award Notification

During the application selection process for BRIC and FMA, FEMA will notify applicants whether subapplications have been identified for further review, potentially eligible but not selected, or determined ineligible for assistance. A determination of "identified for further review" is not a notification or guarantee of an award. FEMA will work with applicants on subapplications identified for further review. Applicants will be notified of required activities such as an environmental and historic preservation (EHP) review, verification of subapplicant commitments, and/or verification of hazard mitigation plan status, as well as the date by which all required activities must be completed.

FEMA may provide comments on subapplications determined to be ineligible in order for subapplicants to modify their subapplications for resubmission in future assistance cycles.

B.1. Applicant Award Package

FEMA will provide an award package to the recipient for approved work under the federal award. Subapplicants will receive notice of award from the applicant.

The applicant award package for HMA programs generally includes:

- An award letter.
- An obligation report.
- Terms and conditions.
- EHP award conditions.
- Other conditions/compliance documentation.

Applicants and subapplicants must review the EHP award conditions included in the award package for awareness and understanding. For more information about conditions, refer to Part 3. Failure to comply with EHP award conditions may jeopardize assistance.

When the applicant or subapplicant accepts an award, they are denoted as the recipient and subrecipient, respectively. The recipient and subrecipient agree to abide by the federal award terms and conditions as outlined in the award package.

B.2. Large Project Notification

Large project notification is the process by which FEMA notifies Congress of any obligations of $1 million federal share or greater before obligating an award.

C. Appeal Process for Denied Subapplicants

Applicants and subapplicants can appeal denied subapplications. This process is covered in program-specific detail in Part 10.

C.1. Consideration of Additional Information

FEMA may, at its discretion, notify applicants that it will consider additional information in support of a subapplication. FEMA will accept supplemental or corrected data in support of a subapplication when submitted subapplications do not exhaust available program assistance or when determined appropriate by the program office.

Instructions for submitting supplemental information will be provided within the FEMA notification letter, if applicable.

Part 8. Award Administrative Requirements

This part of the Hazard Mitigation Assistance (HMA) Guide discusses how successful recipients and subrecipients will receive award information and assistance. Additionally, this part describes administrative requirements from the time an award is made through closeout and the maintenance actions that must occur after an activity is complete.

A. Efficient and Effective Grants Management for Recipients

Before applying for a grant opportunity, applicants and subapplicants should commit to practicing efficient grants management and complete activities in a timely manner. Efficient grants management supports the delivery of the Federal Emergency Management Agency's (FEMA) programs.

Efficient grants management includes:

- Submitting complete applications.
- Submitting all subapplications prior to the close of the application period.
- Conducting monitoring and performance tracking of expenditures within the period of performance.
- Submitting quarterly progress and financial reports on time.
- Ensuring the completion of appropriate environmental and historic preservation (EHP) documentation and actions, as applicable.
- Finishing mitigation activities before the end of the period of performance.
- Submitting final progress and financial reports on time.
- Closing the award in a timely manner.
- Maintaining fiscal responsibility.
- Complying with the terms and conditions of the award (including FEMA-state and FEMA-tribal agreements).
- Ensuring there are trained staff who understand the program and provide technical assistance to the subrecipients.

B. Responsibilities of Recipients

After FEMA approves the subapplications and awards assistance, the agency transfers assistance to the applicant who, during the award stage, is referred to as the recipient (state, tribe or territory). Therefore, the applicant becomes the recipient and is generally referred to as a pass-through entity. The recipient receives the money and passes it on to the subrecipient. Because recipients/pass-through entities manage the award and subawards provided to their subrecipients, they have additional responsibilities.[203]

All pass-through entities (recipients) must:

- Ensure every subaward is clearly identified to the subrecipient as a subaward and includes all information required.[204]
- Evaluate each subrecipient's risk of non-compliance with federal statutes, regulations and the terms and conditions of the subaward for purposes of determining the appropriate subrecipient monitoring.[205]
- Consider imposing additional specific subaward conditions on a subrecipient, if appropriate, and notify the subrecipient.[206]
- Monitor the activities of the subrecipient as necessary to ensure the subaward is used for authorized purposes; that the activities comply with federal statutes, regulations, and the terms and conditions of the subaward; and that subaward performance goals are achieved.[207]
- Review financial and progress reports.[208]
- Submit quarterly reports to FEMA on time.[209]
- Follow up and ensure that the subrecipient takes timely and appropriate action for all deficiencies pertaining to the federal award provided to the subrecipient from the pass-through entity detected through audits, on-site reviews and other monitoring activity.

[203] Recipients may have additional roles and responsibilities as outlined in the respective regulations or Notices of Funding Opportunities governing each program. For example, refer to 44 Code of Federal Regulations (CFR) § 206.433 for the Hazard Mitigation Grant Program and 44 CFR § 77.3 for the Flood Mitigation Assistance program.
[204] 2 CFR § 200.332(a)
[205] 2 CFR § 200.332(b)
[206] 2 CFR § 200.208; 2 CFR § 200.332(c)
[207] 2 CFR § 200.332(d)
[208] 44 CFR § 206.438(c); 2 CFR § 200.332(d)(1)
[209] 2 CFR § 200.332(d)(2)

- Issue a management decision for audit findings as required.[210]
- Verify that every subrecipient is audited, as required by 2 CFR Part 200, when it is expected that the subrecipient's federal awards expended during the respective fiscal year equaled or exceeded the threshold set forth in audit requirements.[211]
- Consider whether the results of the subrecipient's audits, on-site reviews or other monitoring indicate conditions that necessitate adjustments to the pass-through entity's own records.[212]
- Consider taking enforcement action against non-compliant subrecipients.[213]

C. Assessment of Risk Posed by Recipient and Subrecipient Prior to Award

Prior to making an award, FEMA will evaluate a recipient to determine the level of risk when there is a history of failure to comply with general or specific terms and conditions of a federal award or failure to meet the expected performance goals. Some elements that FEMA will review include financial stability, quality of management systems, history of performance (including compliance with reporting requirements), conformance to the terms and conditions of previous awards, reports and findings from prior audits, and the ability to effectively implement statutory, regulatory and other program requirements imposed on the recipient. If FEMA determines that a federal award will be made, special conditions that correspond to the degree of risk assessed may be applied to the award.[214]

As part of the risk assessment, the federal awarding agency is required by the Improper Payments Elimination and Recovery Improvement Act of 2012[215] to review information available through any Office of Management and Budget-designated repositories of government-wide eligibility qualification or financial integrity information as appropriate.[216] FEMA must also review a recipient's status in the System for Award Management. FEMA must comply with government-wide suspension and debarment regulations and require that non-federal entities comply with these requirements.[217] Recipients must also conduct risk assessments of their subrecipients.[218]

[210] 2 CFR § 200.521; 2 CFR § 200.332(d)(3)
[211] 2 CFR § 200.501; 2 CFR § 200.332(f)
[212] 2 CFR § 200.332(g)
[213] 2 CFR § 200.339; 2 CFR § 200.332(h)
[214] 2 CFR § 200.206(b)(1)
[215] Public Law 112-248 (Jan. 10, 2013)
[216] 31 United States Code (U.S.C.) § 3321, note, 41 U.S.C. § 2313
[217] 2 CFR § 200.206(d)
[218] 2 CFR § 200.332(b)

If a recipient determines a particular risk associated with a subrecipient, the recipient may impose additional conditions or requirements. [219] If additional conditions and requirements are imposed, FEMA must promptly remove them once the conditions that prompted the additional conditions or requirements have been satisfied.[220]

For HMA programs, additional conditions or requirements may include:

- Requiring payments as reimbursement rather than advance payments.
- Withholding authority to proceed to the next phase until receipt of evidence of acceptable progress within a given period of performance is provided.
- Requiring additional, more detailed financial reports.
- Requiring additional monitoring.
- Requiring the recipient or subrecipient to obtain technical or management assistance.
- Establishing additional prior approvals, such as requiring the preparation of a management plan.

For those recipients that receive assistance from FEMA regularly, designated staff shall complete the risk assessment annually at the beginning of the fiscal year. For other recipients, the assessment will be completed at the time of application review and then annually until the period of performance has ended.[221]

Recipients can request reconsideration of the specific conditions using the appeal or reconsideration process described in Part 10. If the appeal or reconsideration is successful, or if the circumstances that prompted imposing specific conditions have been corrected, FEMA must remove specific conditions.

Refer to Part 10 for more information on program-specific appeals or reconsiderations.

D. Strategic Funds Management

Strategic Funds Management is FEMA's process for obligating assistance in increments based on the recipient's and/or subrecipient's schedule to execute the work, including management costs. Strategic funds management does not change the activity eligibility process but is a method of approving work and providing assistance as needed.

[219] 2 CFR § 200.208
[220] 2 CFR § 200.208(e)
[221] 2 CFR § 200.206

Strategic funds management:

- Works as a tool that FEMA uses to manage funds more efficiently.
- Promotes fiscal responsibility and better project management by incrementally assisting activities as each project milestone is reached.
- Allows FEMA to reduce the number of unexpended obligations over time.
- Enhances FEMA's grants management capabilities consistent with appropriations and the Budget Control Act of 2011.[222]
- Helps to avoid restrictions on hazard mitigation assistance that may occur under Immediate Needs Funding. Immediate Needs Funding is implemented to preserve assistance in the Disaster Relief Fund for the immediate needs of current or future disasters.

If a subaward is appropriate for strategic funds management, FEMA and the recipient/subrecipient will review the budget and work schedule to ensure the activity supports incremental obligation. Obligations are executed in increments, based on the activity meeting an established milestone schedule, until the scope of work is completed.

Strategic funds management should be used if one of the following is true:

- The federal share of a subapplication/subaward is greater than $1 million and the recipient/subrecipient does not need assistance for more than 180 calendar days from the time the subaward is ready for obligation.
- A recipient's management costs application is greater than $500,000.
- A subrecipient's management costs are greater than $25,000.

If strategic funds management is required, FEMA will obligate assistance for mitigation activities based on the schedule included with the subapplication unless contractual agreements require additional assistance. Management costs obligations will cover no more than one year unless contractual agreements require additional assistance. The recipient is responsible for notifying the subrecipient that assistance is available and for distributing the assistance to the appropriate subrecipient. Assistance that FEMA has obligated is available to the recipient to pass through to the appropriate subrecipient.

D.1. Strategic Funds Management Procedures

This section delineates the procedures for strategic funds management.

[222] Public Law 112-25 (Aug. 2, 2011)

D.1.1. CONSIDERING STRATEGIC FUNDS MANAGEMENT IMPACTS FOR HAZARD MITIGATION ASSISTANCE SUBAPPLICATIONS

Applicants and subapplicants are encouraged to consider FEMA's use of strategic funds management early in the decision-making process to help facilitate the development of a feasible activity budget and appropriate activity milestones. If FEMA determines an activity is suitable for strategic funds management (such as HMA activities with a $1 million federal share or greater), the subrecipient should prepare activity budgets so that line items for logical segments of work can be selected for each obligation. This will avoid having to rework the budget later when FEMA determines the activity required strategic funds management. The work schedule should include the time frame in which subsequent obligations are anticipated.

D.1.2. EVALUATING HAZARD MITIGATION ASSISTANCE ACTIVITIES FOR STRATEGIC FUNDS MANAGEMENT POTENTIAL

Recipients, subrecipients and FEMA staff must evaluate all HMA activities with a $1 million federal share or greater to determine whether the activity is a candidate for strategic funds management. This evaluation will allow FEMA to approve and obligate only the assistance drawn down by the recipient within a reasonable period.

FEMA recognizes that certain activities may not be suitable for strategic funds management. The following mitigation activities are not required to use strategic funds management:

- Mitigation activities that require an approved source of assistance (full obligation) by the state, local, tribal and territorial procurement requirements for the applicant to enter procurement and contracting.
- Mitigation activities for which most of the assistance will be disbursed within 180 calendar days.

If strategic funds management is not used on a mitigation activity with a federal share of $1 million or greater, the recipient must provide proper justification to FEMA. While FEMA may decide not to apply strategic funds management to the mitigation activity, management costs may still be incrementally obligated.

If a mitigation activity is selected for strategic funds management, FEMA will notify the recipient if the subaward needs to be revised to facilitate strategic funds management by adjusting budgets and schedules accordingly. The recipient must ensure the budget reflects line items that support incremental assistance based on the proposed work schedule. The recipient should coordinate with the subrecipient to revise the subaward to support strategic funds management.

FEMA and the recipient must capture the proposed obligation schedule in the electronic application system.

D.1.3. LARGE PROJECT NOTIFICATION REQUIREMENTS

If any of the strategic funds management award increments are $1 million federal share or greater, the large project notification process is required. FEMA must complete the large project notification process prior to the obligation and approval of the initial strategic funds management increment.

D.1.4. MANAGING SUBSEQUENT FUNDING OBLIGATIONS THROUGH QUARTERLY REPORTING

FEMA verifies the need for subsequent obligations through quarterly reporting. Subsequent obligations are based on subaward progress and milestones as reflected in the quarterly reports. If a recipient is not on target for scheduled assistance drawdowns or subaward completion requirements, FEMA will work with the recipient to revise the award dates and update the spend plan. For more information about spend plans, refer to Part 10.

The recipient notifies FEMA in writing (email or other correspondence) when they require assistance to meet the activity schedule. Recipients should request the release of the next increment of assistance a minimum of 30 calendar days before they need the assistance. The 30-day minimum allows FEMA and the recipient time to coordinate the spend plan and any strategic funds management schedule adjustments. Additional obligations are processed through electronic application systems pursuant to the normal course of activity implementation and subsequent assistance.

FEMA regional offices are encouraged to share strategic funds management reports with recipients for ongoing coordination.

D.1.5. STRATEGIC FUNDS MANAGEMENT APPEAL PROCESS

The decision to use strategic funds management, including the timing and execution of the obligation action by FEMA, is not subject to appeal.

E. Cost Share Documentation

Requirements for cash and third-party in-kind contributions can be found in grants management regulations.[223] Cash and third-party in-kind contributions are only allowable for eligible program costs; however, they are necessary and reasonable for completing the scope of work.

The approved budget identifies cost share. The following documentation is required for cash and third-party in-kind contributions:

- Identification of contributions in the approved budget.

[223] 2 CFR § 200.306

- Record of donor (who donated, quantity used, location of work provided, invoices or other documentation to determine value).
- Dates of donation (the donation must be within the period of performance).
- Rates for staffing, equipment usage, supplies, etc.
- Amounts of donation or value of donation.[224]
- Deposit slips for cash contributions.

The applicant/subapplicant must keep documentation on file.

Unrecovered indirect costs cannot be considered as non-federal cost share because of program and statutory requirements that define indirect costs as management costs. Management costs are subject to financial restrictions.

F. Budget and Scope of Work Changes

Recipients are required to report deviations from budget, project scope or objectives. Recipients must request prior approvals from FEMA for certain budget and program plan revisions in accordance with this section and the requirements in 2 CFR § 200.308.

Requests must be made in writing and demonstrate the need for a budget or scope change and include the revised scope, schedule and budget. When budget changes are made, all program requirements continue to apply. Changes must be made prior to closeout to avoid disallowance of costs.

All approvals will be at FEMA's discretion. Failure of the recipient to obtain prior written approval may result in the disallowance of costs. Even in cases where the recipient has authority for rebudgeting, if a program audit determines the costs do not meet the required allowable and reasonable determination, the costs may be disallowed.

The recipient must also notify FEMA as soon as an underrun or overrun is identified.

The following types of post-award changes will require the prior written approval of FEMA.

F.1. Non-Construction Subaward Changes

For non-construction subawards, prior FEMA approval is required for the following reasons:[225]

[224] 2 CFR § 200.434
[225] 2 CFR § 200.308(c) and 2 CFR § 200.308(f)

- A change in a key person specified in the application or the federal award.
- The disengagement from the project for more than three months or a 25% reduction in time devoted to the project by the approved project director or principal investigator.
- The inclusion, unless waived by FEMA, of costs that require prior approval in accordance with 2 CFR Part 200, Subpart E, as applicable.
- The transfer of funds budgeted for participant support costs to other categories of expense.
- The need arises for additional federal funds to complete the project.
- The transfer of funds within the budget among direct cost categories, functions and activities for federal awards in which the federal share of the project exceeds the simplified acquisition threshold. Additionally, the cumulative amount of such transfers exceeds or is expected to exceed 10% of the total budget as last approved by FEMA. Any subaward adjustment or transfer must be consistent with the scope of the award.

F.2. Construction Subaward Changes

For construction subawards, prior FEMA approval is required for the following reasons:

- Additional federal funds are needed to complete the project.
- A revision involves specific costs for which prior written approval requirements may be imposed consistent with applicable OMB cost principles listed in 2 CFR Part 200, Subpart E.
- When the subaward provides support for construction and non-construction work, the recipient must obtain prior approval before making any fund or budget transfers between the two types of work supported.

Additional information regarding budget adjustments and revisions can be found in 2 CFR § 200.308(h).

F.3. Cost Overruns and Underruns

A cost overrun, also known as a cost increase or budget overrun, is an unexpected cost increase needed to complete the project and may occur as the result of unfeasible cost estimates, underestimated complexity, prolonged schedules or other reasons. A cost underrun, also known as a cost decrease or budget underrun, is an unexpected reduction in costs needed to complete the project. A cost overrun or underrun may result from a scope, schedule or budget change.

The recipient must notify FEMA as soon as an underrun or overrun is identified. Before redirecting underrun assistance to overrun requests within the same award, the recipient must request and receive FEMA approval. The recipient may request additional federal assistance for identified overruns, which FEMA may approve if program assistance is available. The subaward must continue

to meet cost share and eligibility requirements. For example, cost overruns and underruns may affect the amount of available subrecipient management costs. Refer to Part 13 for more information.

For mitigation activities, a new Benefit-Cost Analysis (BCA) may be required if the recipient requests additional assistance.

F.4. Contingencies

A contingency cost is an allowance in the total budget to cover situations that cannot be fully defined when the budget is prepared but will likely result in additional eligible costs. Allowances for major project scope changes, unforeseen risks or extraordinary events may not be included as contingency costs.

For project applications, budgets may include contingencies; however, the recommended total contingency range is 1% to 5%. Contingency costs may be raised to 7% for historic properties as defined under the National Historic Preservation Act.[226] Recipients who request contingencies above these amounts must include a cost analysis that documents the percentage is reasonable.

Contingency costs must be included as a line item (cost category) in the budget of a project application if contingency costs have been identified. As with other line items in the budget, the subapplicant should justify the contingency estimate based on the nature of the proposed project. The total project cost, which may include contingencies, will be used to compute the BCA.

Contingency assistance is not automatically available for use. Prior to its release, contingency assistance must be rebudgeted to another direct cost category. Post-award changes to the budget to access contingency assistance require prior written approval from FEMA. The written request should demonstrate what unforeseen condition related to the project arose that required the use of contingency assistance.

G. Period of Performance

The period of performance is the time period during which the recipient and subrecipient may incur new obligations to carry out all administrative actions and award activities and incur costs. [227] Recipients and subrecipients are expected to complete the federal award activities including administrative actions and to incur approved assistance within the period of performance.

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[226] Public Law 89-665 (Oct. 15, 1966)

[227] Period of performance is defined at 2 CFR § 200.1 as "the total estimated time interval between the start of an initial Federal award and the planned end date, which may include one or more funded portions, or budget periods. Identification of the period of performance in the Federal award per § 200.211(b)(5) does not commit the awarding agency to fund the award beyond the currently approved budget period." Budget period is defined at 2 CFR § 200.1 as "the time interval from the start date of a funded portion of an award to the end date of that funded portion during which recipients are authorized to expend the funds awarded, including any funds carried forward or other revisions pursuant to § 200.308." FEMA awards only include one budget period, so it will be same as the period of performance.

Equipment and services and other activities funded by a subaward must be performed, delivered and completed within the subaward period of performance. The recipient must include the start and end dates of the subaward period of performance in the subaward. The period of performance does not include the closeout and liquidation time frames established by 2 CFR § 200.344. Project costs and management costs incurred after the period of performance are not eligible. HMA recipients and subrecipients must complete all administrative actions within the respective award or subaward period of performance if they seek federal assistance to cover the costs.

G.1. Award Period of Performance

FEMA must include the start and end dates of the period of performance in the federal award.

The period of performance for the Hazard Mitigation Grant Program (HMGP) begins with the opening of the application period and ends no later than 48 months from the close of the application period.

The period of performance for Hazard Mitigation Grant Program Post Fire (HMGP Post Fire) begins at the opening of the application period (i.e., date of Fire Management Assistance Grant [FMAG] declaration) and ends 48 months after the close of the application period.

Notices of Funding Opportunity (NOFOs) establish the periods of performance for the Building Resilient Infrastructure and Communities (BRIC) and Flood Mitigation Assistance (FMA) programs. For more information on program-specific periods of performance, refer to Part 10.

G.2. Subaward Period of Performance

FEMA does not establish activity completion timelines for individual subawards. Recipients are responsible for establishing the subaward period of performance start and end dates at the time the subaward is granted.[228] Recipients must include a period of performance in all subaward agreements and are responsible for ensuring that all approved activities, including management costs, are completed and that all costs are incurred by the end of the subaward period of performance. The recipient must establish the subaward period of performance based on the schedule included in the subapplication.

G.3. Award Extensions

Requests for extensions to an award period of performance will be evaluated by FEMA but will not be automatically approved.

For HMGP and HMGP Post Fire, the FEMA regional administrator may issue up to two extensions of the award period of performance for up to 12 months each. All requests to extend the award period

[228] 2 CFR § 200.332(a)(1)(v)

of performance beyond 24 months from the original award period of performance end date must be approved by FEMA headquarters.

Recipients must submit extension requests to the recipient's respective FEMA region at least 90 calendar days prior to the award period of performance's expiration. If the extension request is received less than 90 calendar days prior to the award period of performance's expiration, FEMA may deny the request.

The written request must contain specific and compelling justification for why an extension is required. Recipients are advised to coordinate with the FEMA region when preparing an extension. The justification must include:

- Program name, fiscal year and award number.
- Verification that progress has been made as described in Quarterly Progress Reports[229] including dates of previous extensions.
- Reason(s) for delay, including details of the legal, policy or operational challenges that prevent the final outlay of awarded assistance by the applicable deadline.
- Status of the activity/activities.
- Period of performance end date and new completion date.
- Amount of assistance drawn down to date.
- Remaining available assistance, both federal and non-federal.
- Budget outlining how remaining federal and non-federal assistance will be expended.
- Plan for completion, including milestones and time frames for achieving each milestone and the position/person responsible for implementing the plan for completion.
- Certification that the activity/activities will be completed within the extended period of performance without any modification to the original scope of work approved by FEMA.

For BRIC and FMA, the NOFO establishes the availability of extensions and what information the applicant should include in the extension request.

FEMA will evaluate requests for extensions to an award period of performance. Based on the sufficiency of justification, FEMA may issue an extension as permitted by the guidance or NOFO. If

[229] Quarterly Progress Reports may also be referred to as Quarterly Performance Reports.

FEMA approves the extension, the recipient will receive an updated period of performance establishment letter.

H. Requests for Advancements and Reimbursements

It is the recipient's responsibility to process requests for advances and reimbursements of assistance. The recipient should establish accounting procedures to disburse money to subrecipients in a timely manner and provide subrecipients with a point of contact for information on assistance to be requested and received, records that must be maintained, forms to be used, and timelines for requesting the assistance.

Recipients shall submit a copy of Standard Form (SF) 270: *Request for Advance or Reimbursement*, to FEMA via the electronic application system.

I. Program Income

FEMA encourages recipients/subrecipients to generate program income to help defray program costs. Program income is gross income received by the recipient/subrecipient directly generated by an award-supported activity or earned only because of the award during the award period of performance.[230] Program income may be derived from the use or rental of real or personal property acquired with award assistance as well as the sale of commodities or items fabricated under the award. Subrecipients must deduct this income from total activity costs.[231] The recipient/subrecipient must report their program income to FEMA for the proper treatment of the program income under the award. The recipient should report program income earned under the award on its next quarterly SF-425: *Federal Financial Report*.

After the period of performance, the recipient and subrecipient may generate income but are no longer required to report the income to FEMA.[232] For example, a community may rent parcels acquired under 44 CFR Part 80 to community members to use as garden space as long as the open space requirements and FEMA deed restrictions are followed.

J. Federal Income Tax on Mitigation Project Assistance

FEMA mitigation assistance that benefits property owners by mitigating their structures is not subject to federal income taxation. FEMA mitigation assistance used to acquire a property will be treated as an involuntary conversion for tax purposes. For more information, property owners should consult the Internal Revenue Service office or a tax advisor.

[230] 2 CFR § 200.1
[231] 2 CFR § 200.307
[232] 2 CFR 200.307(f)

K. Remedies for Non-Compliance

If a recipient fails to comply with federal statutes, regulations or terms and conditions of a federal award—whether they are stated in an assurance, a HMGP Administrative Plan or application, a notice of award, the guidance or elsewhere—FEMA may take one or more of the following actions, as appropriate:

- Temporarily withhold cash payments pending correction of the deficiency by the recipient.
- Disallow (that is, deny both use of assistance and any applicable matching credit for) all or part of the costs of the activity or action not in compliance.
- Wholly or partly suspend or terminate the federal award.
- Initiate suspension or debarment proceedings.
- Withhold further federal awards for the activity.
- Take other remedies that may be legally available.[233]
- Terminate the federal award if a recipient fails to comply with the terms and conditions of a federal award.[234]

These remedies may be applied to non-compliance findings from the Government Accountability Office and Department of Homeland Security Office of the Inspector General audits. For single audits, FEMA will first use the notification procedures in Part 9; however, if compliance is not achieved through implementing corrective actions, the remedies outlined in Part 8.K.1.6 will be used.

K.1. Actions to Address Deficiencies

When there is a deficiency finding, FEMA will notify the recipient of the deficiency and request that the issue be corrected. If compliance cannot be achieved, FEMA will apply one of the remedy actions allowed in Remedies of Non-compliance.[235] These actions may result in the reduction of assistance, the placement of special conditions upon the award, and/or suspension or termination of the award.

FEMA will generally work with the recipient to address the deficiency using the Request for Information (RFI) procedures. If attempts to work with the recipient do not result in compliance, the appropriate FEMA project officer will initiate the procedures outlined in this section, such as:

[233] 2 CFR § 200.339
[234] 2 CFR § 200.340(a)(1)
[235] 2 CFR § 200.339

- Documenting the deficiency using an RFI.
- Reviewing the deficiency to determine if it can be corrected.
    - If the project officer determines the recipient can correct the deficiency, the officer will proceed with providing a compliance notification to the recipient. If the project officer determines the recipient cannot correct the deficiency, the officer will proceed with applying remedy actions.
    - If there is a regulation or program statute that requires FEMA to take specific enforcement action, such as administrative closeout, the project officer will proceed with providing a compliance notification to the recipient.[236]

This process is an opportunity for the recipient to demonstrate it complies or to take actions to come into compliance prior to FEMA taking remedy actions.

K.1.1. COMPLIANCE NOTIFICATION TO RECIPIENT

After completing the RFI procedures, the FEMA regional administrator or their designee will send a written deficiency to the recipient advising of the deficiency, as well as the requirement to submit a Compliance Action Plan within 60 calendar days of the date of the notification. The notification will contain the following information:

- The deficiency at issue, with reference to the applicable law, regulation, guidance and/or policy, and the basis for FEMA's determination that the deficiency exists.
- FEMA's recommended corrective actions and completion dates to come into compliance.
- That the recipient has a maximum of 60 calendar days from the date of the deficiency notification to submit to FEMA either of the following:
    - A proposed Compliance Action Plan detailing corrective actions and the estimated completion dates to come into compliance.
    - If the recipient does not concur with FEMA's finding of deficiency, an explanation and documentation to show compliance.
- That if the recipient does not demonstrate compliance within the prescribed completion dates, FEMA will take remedy action(s), which may include a reduction in assistance, placement of special conditions on the grant award, or suspension or termination of assistance.

[236] 2 CFR § 200.344

FEMA will only approve a Compliance Action Plan that includes:

- A description of the corrective actions the recipient proposes to come into compliance with requirements.
- The estimated completion dates for each of the corrective action(s), with milestones. All deficiencies should be addressed prior to the end of the period of performance.

If the recipient does not provide the Compliance Action Plan to FEMA within 60 calendar days, FEMA will start remedy actions. If the recipient does not concur with FEMA's finding of deficiency, it must provide to FEMA an explanation and documentation demonstrating that the recipient complies within 60 calendar days of the deficiency notification date. If FEMA determines the recipient's explanation and documentation are not enough to demonstrate compliance, the recipient must provide a Compliance Action Plan within 30 calendar days of FEMA's determination. Within 45 calendar days of receipt of the Compliance Action Plan, FEMA will review the proposed Compliance Action Plan and notify the recipient of the agency's determination.

If the FEMA project officer approves the proposed Compliance Action Plan, the notice will include a timeline for corrective action updates from the recipient. If the project officer does not approve the Compliance Action Plan, the notice will include the reason the Compliance Action Plan is inadequate and provide a maximum additional 60 calendar days to adequately revise the Compliance Action Plan. If after the 60-day period the project officer determines the revised Compliance Action Plan is still inadequate, or the recipient is not responsive, the project officer will start procedures to apply remedy actions.

K.1.2. COMPLIANCE ACTION PLAN MONITORING

The recipient must provide updates every 90 calendar days, which can be included in the Quarterly Progress Reports, if applicable, or more frequently as prescribed by FEMA. If the recipient does not provide the FEMA project officer with timely progress reports or is otherwise not responsive to FEMA requests, the project officer will proceed with applying remedy actions.

K.1.3. SPECIFIC AWARD CONDITIONS

Specific award conditions may include the following: [237]

- Requiring payments as reimbursements rather than advance payments, such as imposing controlled drawdowns in the appropriate Award Payment System by (1) placing any assistance on hold and (2) only releasing assistance for drawdown when the recipient provides a request for reimbursement with SF-270 and full support documentation for the requested payment.

[237] 2 CFR § 200.208(c)

- Withholding authority from the recipient to proceed to later phases of its activity until FEMA receives satisfactory evidence of acceptable performance within a given period of performance.
- Requiring additional and/or more detailed financial or program progress reports.
- Requiring more frequent reports and/or additional information in reports on an as-needed basis or on a recurring schedule as deemed appropriate based on the non-compliance and circumstances.
- Requiring additional activity monitoring.
- Requiring the recipient/subrecipient to obtain technical or management assistance such as requiring technical assistance visits, desk reviews or site visits by the relevant program office to ensure recipients or subrecipients are taking the appropriate actions to correct non-compliance or if there is a need to continue monitoring because of non-compliance.
- Requiring the recipient or subrecipient to obtain specialized technical or management assistance, including but not limited to webinars targeted at specific issues or concerns, training from FEMA's Procurement Disaster Assistance Team, or hiring a contractor to review the recipient's financial systems and make recommendations.
- Establishing additional prior approvals.
- Placing a hold or stop payment on the grant award in the appropriate Award Payment System pending the recipient's submission of satisfactory documentation showing acceptable performance.
- Notifying the recipient of the additional requirements, the reason the requirements are needed, the nature of the action needed, the time allowed for completing the actions, and information about the appeal process if the recipient determines the issues have been resolved. [238]

K.1.4. REQUESTS FOR CLOSURE AND DETERMINATION ON CORRECTIVE ACTIONS

The recipient must provide documentation to demonstrate they have come into compliance and request closure of the relevant finding(s) of deficiency. If, after review of the recipient's request for closure, the FEMA project officer determines the recipient completed the corrective action(s), the project officer will notify the recipient in writing of its compliance determination within 30 calendar days.

[238] 2 CFR § 200.208(d)

K.1.5. DETERMINATION THAT RECIPIENT DID NOT COME INTO COMPLIANCE

If, after reviewing the supporting documentation, the FEMA project officer determines the recipient did not complete the corrective action(s), the project officer will start procedures to apply remedy actions.

The project officer will consider the recipient's failure to comply with a Compliance Action Plan as an aggravating factor and will start procedures to apply remedy actions.

K.1.6. APPLYING REMEDY ACTIONS

If the FEMA project officer determines the recipient could not or did not correct the deficiency, the project officer will proceed to apply remedy actions by notifying the recipient of such action within 30 calendar days. The notice will contain the following:

- The requirement(s) at issue, with a reference to the applicable regulation and/or policy, and the basis for FEMA's determination that the deficiency exists.
- Actions taken by the recipient, if any, to attempt to come into compliance, and actions taken by FEMA, if applicable, to assist the recipient with coming into compliance.
- Notification that FEMA is applying remedy action(s) and the effective date.
- Notice of the recipient's opportunity to object through an appeal procedure.

K.1.7. MITIGATING AND AGGRAVATING FACTORS

FEMA reviewers can use remedies of non-compliance by considering mitigating and aggravating factors when determining which option to apply. FEMA may consider mitigating and aggravating factors in determining whether to apply remedies of non-compliance.

Mitigating factors include:

- Minor or single instance of deficiency.
- Emergency or extenuating circumstances directly impacting ability to comply.
- First-time deficiency.
- Capacity of the recipient (such as needing technical assistance to apply for an extraordinary HMGP award).
- Recipient self-identifies deficiency to FEMA along with a Compliance Action Plan to address.
- Unheeded requests for assistance from the recipient to FEMA to ensure compliance with new or involved grant requirements.

- Attendance at training events to better understand grant requirements.
- Deficiency is the result of incorrect or delayed information provided by FEMA.
- Other factors that the FEMA reviewer articulates in writing that indicate a relief is needed to manage the award.

Aggravating factors include:

- Experienced or sophisticated recipient or subrecipient with repeated prior instances of non-compliance.
- Numerous instances of non-compliance with the same activity, subaward or award.
- Civil or criminal penalties associated with the non-compliance.
- Non-responsiveness to FEMA requests.
- Fraudulent reporting or evidence of other deliberate intent to not follow requirements.
- Prior instances of fraud, waste and abuse.
- Failure to process required grants management activities in a timely manner.
- Declining or refusing to attend trainings explaining grants management requirements.
- Disregarded or failed opportunity to correct the non-compliance.
- Other factors that the compliance official articulates in writing that indicate a more severe remedy action.

L. Award Termination

The federal award, whether the award or subaward, may be terminated in whole or in part under the following circumstances:

- By FEMA or the recipient, if the recipient or subrecipient fails to comply with the terms and conditions of the award. If the non-compliance can be corrected, FEMA may first attempt to direct the recipient to correct the non-compliance.[239] For information on the remedies on non-compliance and notification procedures, refer to Part 8.K. FEMA may report in the Federal Awardee Performance and Integrity Information System.

[239] 2 CFR § 200.340, 2 CFR § 200.339

- By FEMA or the recipient, if the subaward no longer effectuates the program goals or agency priorities.
- By FEMA, with the recipient's consent, or by the recipient with the subrecipient's consent. In either instance, the two parties must agree with the termination conditions, including the effective date and, in the case of a partial termination, the portion to be terminated. Only the consent of the two relevant parties is required for the termination.
- By the subrecipient upon sending to the recipient or FEMA written notification of the termination, including the reason for the termination, the effective date, and—in the case of a partial termination—the portion to be terminated. In the case of partial termination, FEMA may determine that a partially terminated award will not accomplish the purpose of the federal award, so FEMA may terminate the award in its entirety. If that occurs, FEMA will follow the requirements of 2 CFR § 200.341 and 2 CFR § 200.342 in deciding to fully terminate the award.
- By FEMA or the recipient pursuant to the termination provisions included in the award.

FEMA and the recipient must comply with closeout requirements even if an award is terminated in whole or in part.[240]

M. Davis-Bacon and Related Acts

The Davis-Bacon and Related Acts (Davis-Bacon Act) [241] require the payment of prevailing wages on certain federally funded or funded construction activities. The Davis-Bacon Act does not apply to HMA programs as it is not required by the programs' authorizing statutes. However, Davis-Bacon Act compliance may be required if HMA is used in conjunction with another federal agency's grant, such as Community Development Block Grant Disaster Recovery funding from the Department of Housing and Urban Development or if required by state, local, tribal and territorial government laws.

[240] 2 CFR § 200.340(d), 2 CFR § 200.344, 2 CFR § 200.345
[241] Public Law 107-217 (Aug. 21, 2002), as amended

Part 9. Award Monitoring and Closeout Requirements

A. Reporting

Recipients and subrecipients must maintain records of work and expenditures. Recipients must submit quarterly financial and progress reports to the Federal Emergency Management Agency (FEMA) on Jan. 30, April 30, July 30 and Oct. 30.[242] In the Hazard Mitigation Assistance Program and Policy Guide (HMA Guide), performance reports are referred to as "progress reports" to align with references in program regulations. Progress and performance reports are subject to the same requirements. The first quarterly reports are due within 30 calendar days of the end of the first federal quarter following the initial award. FEMA may waive the initial progress reports by sending a read receipt email to the recipient's hazard mitigation officer or designated representative. The recipient must submit quarterly financial and progress reports thereafter until the award is closed out. Failure to submit timely financial and progress reports to FEMA may result in an inability to access assistance until FEMA receives the proper reports.

A.1. Federal Financial Reports

Recipients shall submit a quarterly Federal Financial Report (SF-425) throughout the period of performance, including partial calendar quarters as well as in periods where no activity occurs. Obligations and expenditures must be reported quarterly using approved forms, which are due to FEMA within 30 calendar days of the end of each calendar quarter (e.g., for the quarter ending March 31, the Federal Financial Report is due no later than April 30). Future awards and assistance drawdowns may be withheld if these reports are delinquent. The final Federal Financial Report is due 120 calendar days after the end date of the period of performance.[243]

Except for the final Federal Financial Report required for closeout, the reporting periods and due dates are described in Table 9.

Table 9: Federal Financial Report Timing

Quarter	Reporting Period	Report Due Dates
1	Oct. 1 – Dec. 31	Jan. 30
2	Jan. 1 – March 31	April 30
3	April 1 – June 30	July 30

[242] 44 Code of Federal Regulations (CFR) § 206.438(c), 2 CFR § 200.328, 2 CFR § 200.329
[243] 2 CFR § 200.344

Quarter	Reporting Period	Report Due Dates
4	July 1 – Sept. 30	Oct. 30

Reports are submitted via FEMA's electronic application systems unless otherwise directed by the region.

A.2. Quarterly Progress Reports

The recipient shall submit a Quarterly Progress Report for each award to report on the progress of their award. Recipients/subrecipients are required to complete and submit Quarterly Progress Reports to their respective FEMA region 30 calendar days after the end of each fiscal quarter following the initial award and thereafter until the award ends. Reports must be submitted throughout the period of performance, including partial calendar quarters, as well as for periods where no award activity occurs. FEMA may suspend drawdowns from federal financial systems (e.g., Payment Management System [SMARTLINK] or Payment and Reporting System [PARS]) if Quarterly Progress Reports are not submitted on time. FEMA's decision to extend the period of performance for the award or for management costs may be affected by inconsistent data in the Quarterly Progress Reports and in the recipient's request.

Quarterly Progress Reports must include:

- Project identification information, including FEMA project number (including disaster number and declaration date for the Hazard Mitigation Grant Program [HMGP]), subrecipient name, and project type using FEMA's electronic application systems' standard project type codes.
- Significant activities and developments that have occurred or have shown progress during the quarter, including a comparison of actual completion date to the work schedule objectives established in the subaward.
- Percent completion and whether the completion of work is on schedule and anticipated completion date. Percent completion is the percentage of the work that has been completed to date. More information on 100% completion is provided in Part 9.C.1.
- Status of costs, including whether the costs are unchanged, overrun or underrun.
- Incremental assistance amounts (strategic funds management) and progress completed.
- For phased projects, if Phase I of a Phase II project is complete, the percent complete should be noted as a percentage of the entire project (e.g., 50% or whatever is deemed appropriate by the recipient).

- If Phase II is not eligible and will therefore not move forward, the project is considered 100% complete. However, if Phase II is eligible/obligated, the Quarterly Progress Report should reflect 100% only once the approved scope of work is completed under Phase II.

- For acquisition or relocation projects only, indication of the total properties and property identification list.

- Items in the comment column:
  - A brief narrative describing any change in cost status.
  - A discussion of any problems, delays or adverse conditions that will impair the ability to meet the timelines stated in the subaward.
  - The status of each acquired property for which settlement was completed in that quarter.
  - A statement of whether a request to extend the award period of performance is anticipated.
  - Any other information that FEMA may require.

For Building Resilient Infrastructure and Communities (BRIC) and the Flood Mitigation Assistance (FMA) program, Quarterly Progress Reports must be used and submitted via FEMA's electronic application systems. For BRIC and FMA, additional reporting requirements may be included in the respective Notice of Funding Opportunity (NOFO). For more information about HMGP Quarterly Progress Reports, refer to Part 10.

A.3. Final Reports

Subrecipients must submit final financial and progress reports to the recipient when they complete the required work and administrative actions. Subrecipients must submit final reports to the recipient no later than 90 calendar days after the subaward period of performance end date.[244]

For each subaward, the recipient must submit final financial and progress reports to FEMA when they determine that the subrecipient has completed the required work and administrative actions.

For the award, the recipient must submit final financial and progress reports to FEMA when all required work and administrative actions have been completed. The recipient must submit the final financial and progress reports to FEMA no later than 120 calendar days after the award period of performance end date.[245]

[244] 2 CFR § 200.344(a)
[245] 2 CFR § 200.329, 2 CFR § 200.344(a)

A.4. Actions to Address Reporting Deficiencies

All financial and progress reports must be complete and submitted on time. Information in the reports must accurately describe award and subaward activities, including data related to the completion of individual property acquisitions. Incomplete progress reports that do not provide information on all open awards and subawards are considered late. When reports are incomplete or late, FEMA will notify the recipient of the deficiency and request that the issue be corrected following procedures in Part 8. If compliance cannot be achieved, FEMA will apply one of the remedy actions allowed in 2 Code of Federal Regulations (CFR) § 200.339. These actions may result in the reduction of assistance, the placement of special conditions upon the award and/or the suspension or termination of the award.

B. Monitoring Requirements

Monitoring is the responsibility of both FEMA and the recipient. It occurs in several different ways, including the review of Quarterly Progress Reports, site visits, desk reviews or reviewing audit findings. If an issue is identified, FEMA or the recipient may provide technical assistance as necessary. FEMA will also provide a written report of the findings that may include actions that the recipient must take to address non-compliance.

After FEMA makes the award or subaward, both the recipient and the subrecipient are required to monitor and evaluate the progress of the mitigation activity in accordance with the terms outlined in the following documents:

- Approved scope of work and budget.
- Environmental and historic preservation (EHP) award conditions that may require best management practices or monitoring of site conditions (mitigation projects only).
- Any other award terms and conditions.
- Administrative requirements.[246]
- Applicable state, local, tribal and territorial government requirements.

Monitoring requirements are found in the activity-type specific sections (refer to Part 11 and Part 12).

Sound activity monitoring improves the efficiency of the activity implementation process and the obligation of the assistance process. The use of quarterly progress and financial reporting facilitates

[246] 2 CFR Part 200

project management and allows the recipient and FEMA to monitor obligations and any unliquidated assistance.

B.1. Quarterly Progress Report Review

Recipients should review the Quarterly Progress Reports for all open activities using the following evaluation criteria:

- Ensuring the subrecipients are making adequate progress.
- Meeting any requirements for matching or cost sharing.
- Spending assistance only for allowable costs.
- Maintaining adequate systems.
- Ensuring the subrecipient is accountable for federal or federally generated resources, such as program income, federally owned property or property acquired under the award.

Recipients must also ensure that subrecipient management costs are validated quarterly. Any action taken to address a deficiency should be noted in the Quarterly Progress Report. The Quarterly Progress Report gives FEMA staff information needed to identify and address problems before they become serious, provide technical assistance or take other appropriate action. In addition, FEMA is also responsible for validating recipient and subrecipient management costs across all open awards.

B.2. Improper Payment

An improper payment is any payment that FEMA made that was obligated to and drawn down by the recipient and FEMA later determines was made with an incorrect amount (including overpayments and underpayments) under statutory, contractual, administrative or other legally applicable requirements. Improper payments may include:

- Any payment to an ineligible party.
- Any payment for an ineligible good or service.
- Any duplicate payment.
- Any payment for a good or service not received (except for such payments where authorized by law).
- Any payment that does not account for credit for applicable discounts.
- Any payment where insufficient or lack of documentation prevents a reviewer from discerning whether a payment was proper.

B.3. Actions to Address Deficiencies Identified During Monitoring

Based on a review of progress and financial reports, FEMA may notify the recipient of the deficiency and request that the issue be corrected following procedures in Part 8. If compliance cannot be achieved, FEMA will apply one of the remedy actions allowed in 2 CFR § 200.339. These actions may result in the reduction of assistance, the placement of special conditions upon the award and/or suspension or termination of the award.

C. Closeout Requirements

Upon completion, the recipient and subrecipient are required to close out the subaward or federal award. In accordance with 2 CFR § 200.344, the subrecipient has 90 calendar days from the end date of the subaward period of performance to provide all final reports to the recipient, and the recipient has 120 calendar days following the end of the award period of performance to submit all final reports for the federal award. Timely submission is important because under 2 CFR § 200.344(g), the awarding agency or the pass-through entity [recipient] must make every effort to complete all closeout actions for federal awards no later than one year after receipt of final reports. This section discusses subaward and award closeout.

The closeout process will verify that:

- The approved scope of work was completed.
- All obligated assistance was liquidated consistent with the approved scope of work.
- All EHP conditions were completed and documented.
- For planning subawards, all jurisdictions have adopted the mitigation plan (mitigation planning subawards only), or a scope of work change to remove non-adopting jurisdictions has been approved.
- The activity was completed consistently with the award or subaward agreement.
- The recipient and subrecipient submitted all required financial and progress reports.
- The federal award and subaward were closed out in accordance with the provisions outlined in Part 9.

C.1. 100 Percent Work Completion

The subrecipient shall report 100 percent work completion to the recipient when all work associated with the approved scope of work is complete, including meeting all compliance requirements (e.g., EHP, code and permit certifications, obtaining insurance). This work does not include associated grant administrative activities required for closeout (e.g., submitting payments of claims or certifications to the recipient for subaward closeout, financial reconciliation or participating in

recipient site inspections). If the recipient conducts a subsequent site visit and cannot verify that work was completed in compliance with the award and subaward terms, the recipient must correct the next report to indicate that work is not 100% complete. The recipient or FEMA may determine that any non-compliance with the approved scope of work identified during closeout results in disallowed costs under the award.

For hazard mitigation planning and planning-related activities, 100 percent work completion is also when all work within the approved scope of work is complete. For HMA planning subawards, 100 percent work completion is on the date FEMA issues the approval letter after adoption by the jurisdiction(s). FEMA will not delay closeout in cases where some jurisdictions are not actively pursuing plan adoption and approval under a multi-jurisdictional plan and the subaward may not be compliant with the scope of work/subaward conditions. In addition, FEMA will not delay closeout while remedies of non-compliance are under FEMA review. For more information on 100 percent work completion requirements for specific planning activities, refer to Part 11.

C.2. Subaward Closeout

Subaward closeout is the process by which the recipient verifies that a subaward scope of work has been completed as approved and that all reimbursed costs were eligible.

C.2.1. RECIPIENT RESPONSIBILITIES TO SUBAWARD CLOSEOUT

The recipient has primary responsibility for the closeout tasks associated with both the program and subrecipient requirements. The recipient must conduct final inspections for activities, reconcile subrecipient expenditures, resolve negative audit findings, obtain final reports from subrecipients and reconcile the closeout activities of subrecipients with award requirements.[247] These activities cannot extend beyond the award period of performance.

The end date for a subaward period of performance must occur no later than the end date of the period of performance for federal awards detailed in Part 8.G.1.

If the subaward period of performance ends on the same date as the award period of performance, the subrecipient has 90 calendar days from the end date of the subaward period of performance to submit final reports to the recipient.[248] The recipient then has an additional 30 calendar days to submit final reports to FEMA for the entire award, including all subawards. All reports are due to FEMA 120 calendar days after the end of the award period of performance.

FEMA encourages recipients to establish subaward periods of performance and due dates for progress and any other reports that end earlier than the award period of performance. Setting earlier

[247] 2 CFR § 200.344

[248] If the recipient has not established a period of performance for the subaward, and the recipient and subrecipient have not agreed to an earlier final reporting date when the subrecipient's final financial, progress and other required reports are due, the subrecipient's period of performance ends when the recipient's period of performance ends, and 2 CFR § 200.344 deadlines dictate when financial, progress and any other reports are due for the recipient and subrecipient.

deadlines for subawards will allow the recipient additional time to submit all required reports and perform closeout activities prior to the end of the award period of performance.[249]

C.2.2. SUBAWARD CLOSEOUT TIME FRAME AND LIQUIDATION TIME FRAME

A subrecipient must submit to the recipient, no later than 90 calendar days (or an earlier date as agreed upon by the recipient and subrecipient) after the end date of the subaward period of performance, all financial, performance, and other reports as required by the terms and conditions of the federal award.[250] Unless the recipient authorizes an extension, the subrecipient must liquidate all financial obligations incurred under the federal award no later than 120 calendar days after the end date of the subaward period of performance.[251]

If the recipient or subrecipient does not submit all reports in accordance with this section within one year of the award period of performance end date, FEMA must report the recipient or subrecipient's material failure to comply with the terms and conditions of the award with the Office of Management and Budget (OMB)-designated integrity and performance system (currently the Federal Awardee Performance and Integrity Information System [FAPIIS]).[252] FEMA may also pursue other enforcement actions according to 2 CFR § 200.339.

C.2.3. REQUIRED SUBAWARD CLOSEOUT DOCUMENTATION

A completed HMA Closeout Checklist (refer to Table 10) should be submitted to FEMA.

The recipient will submit a claim signed by the governor's authorized representative, tribal authorized representative or an executive authorized signature authority.[253] The claim will certify that:

- The reported costs were incurred in the performance of eligible work.
- The approved work was completed.
- The mitigation activity complies with the provisions of the award agreement.

Additionally, the subaward closeout request must include the following:

- Document of non-federal match.
- Verification that any program income has been deducted from total activity costs as specified in 2 CFR § 200.307.

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[249] FEMA only reimburses costs that occurred during the award period of performance. If the recipient or subrecipient conduct closeout and liquidation after the award period of performance ends, these costs are not eligible.
[250] 2 CFR § 200.344(a)
[251] 2 CFR § 200.344(b)
[252] 2 CFR § 200.344(i)
[253] 44 CFR § 206.438(d), 2 CFR § 200.344

- For project subawards, final site inspection report that contains the name of the inspector, position of the inspector, date of inspection and verification that work was completed. The report should include photographs of the completed project clearly labeled with the FEMA project number, subrecipient name, property address and latitude/longitude to the nearest sixth decimal place, and source of the photograph.
    - Depending on the activity, FEMA may require multiple photographs of the exterior and interior of the properties and the structures or improvements to certify that the approved scope of work was completed.
- Final SF-425, *Federal Financial Report*.
- SF-428, *Tangible Personal Property Report*, if applicable.
- Final activity costs, including federal share, non-federal share, management costs (if applicable) and any modifications, such as approved underrun and overrun requests.
- Latitude and longitude to the nearest sixth decimal place.
    - For flood reduction, hazardous fuels reduction and soil stabilization projects, an accurate recording of the official acreage, using open file format geospatial files (i.e., shapefiles), must be submitted.
- Documentation that lists the environmental conditions that must be met when the project is carried out (from the Record of Environmental Considerations or Environmental Assessment) and certification that the project was completed in compliance with those environmental conditions. If conditions were assigned to the project, provide copies of EHP compliance documentation (such as an environmental permit).
- Certification that the project meets National Flood Insurance Program (NFIP) requirements (if applicable).
- For new or updated hazard mitigation plans, a final copy of the approved plan.
- For planning-related activities, documentation that the completed activity was consistent with the approved scope of work.
- Copies of deliverables identified in the scope of work, if applicable.

For activity-specific requirements, refer to Part 11, Part 12 and Part 13. Recipients should close out subawards as activities are completed. In addition, as cost underruns are identified, the recipient must submit de-obligation requests to FEMA.

C.2.4. SUBAWARD PROCEDURES

FEMA will advise the recipient of the closeout requirements through the award agreement and the HMA Guide. The recipient will advise the subrecipient of closeout requirements through the state-subrecipient agreement.

Upon the completion of each subaward, the recipient submits a closeout request to FEMA for review and concurrence.

FEMA will review all closeout documentation for compliance and may send the recipient a Request for Information (RFI) if needed. FEMA will review the closeout request to verify that the approved mitigation measure complies with all subaward requirements associated with the subaward. The recipient must follow up on and complete all requests.

All correspondence (electronic or otherwise) related to closeout, including RFIs, must be maintained in the recipient's files.

If FEMA does not concur with the closeout request, the agency will document the finding using the RFI process (refer to Part 7) to advise the recipient of the reason(s) for non-concurrence, request additional information and/or explain the corrective actions needed to resolve the non-compliance issues. The recipient must follow up and complete all requests. If the requested information is not submitted, FEMA may disallow costs.

A subaward is officially closed when FEMA approves the request and sends a closeout letter to the recipient confirming the final federal expenditures for the subaward. The recipient will send the subrecipient confirmation that their subaward has been officially closed by FEMA.

C.2.5. SUBAWARD PROCEDURES STATUTE OF LIMITATIONS OF DISALLOWED COSTS FOR HMGP

Unless there is evidence of civil or criminal fraud, FEMA cannot initiate administrative action in any forum to recover any payment made to a state or a local government for disaster or emergency assistance after the date that is three years after the date of transmission of the final expenditure report for project completion as certified by the recipient.[254]

C.2.6. NOTICE AND DEMAND LETTERS

If FEMA identifies a debt, the FEMA Finance Center will notify the recipient in writing, after completion of the appeal process, of the type and amount of debt due, and to provide the recipient with all required notices.

[254] Section 705 of the Robert T. Stafford Disaster Relief and Emergency Assistance Act, Public Law 100-707 (Nov. 23, 1988), amending the Disaster Relief Act of 1974, Public Law 93-288 (May 22, 1974); 42 United States Code (U.S.C.) § 5205

C.2.7. ACTIONS TO ADDRESS CLOSEOUT DEFICIENCIES

When closeout documentation is incomplete or late, FEMA will notify the recipient of the deficiency and request that the issue be corrected following procedures in Part 8. If compliance cannot be achieved, FEMA will apply one or more of the remedy actions allowed in 2 CFR § 200.339. These actions may result in the temporary withholding of cash payments, reduction of assistance, the placement of special conditions upon the award, suspension or termination of the award, or withholding further awards for the program.

C.2.8. SUBRECIPIENT RECORDS RETENTION

Financial records, supporting documents, statistical records and all other subrecipient records pertinent to a federal award must be retained for three years from the date of submission of the final expenditure report.[255] The final expenditure report is final payment of claim to FEMA for each mitigation activity/subaward, as required by FEMA regulation, policy and guidance. FEMA will confirm the report after the receipt of a complete and accurate claim. The confirmed, complete and accurate subaward closeout report is the final expenditure report.

There are some exceptions where the retention period may be longer than three years as noted and required by the recipient.[256] The following examples are the most common instances:

- When FEMA, the cognizant agency for audit, oversight agency for audit, cognizant agency for indirect costs, or pass-through entity notifies the recipient/subrecipient in writing, to extend the retention period, the recipient/subrecipient must keep records for as long as indicated in the notification, which may be longer than three years.
- Records for real property and equipment acquired with federal assistance must generally be retained for three years after disposition. Records for project types where property may be acquired (safe rooms, flood risk reduction measures, and property acquisition and structural demolition/structure relocation) must be kept for the project useful life.

C.3. Recipient Management Costs Closeout

Management costs closeout is the process by which the recipient and FEMA verify that all reimbursed costs were eligible. The recipient submits a request to FEMA to close out management costs; the final payment of management costs is based on actual costs incurred.

Upon completion of the last non-management costs subaward, the recipient must submit a letter to FEMA, signed by the governor's authorized representative, tribal authorized representative or an executive authorized signature authority, certifying that the reported costs were incurred in the management of the HMA award.

[255] 2 CFR §§ 200.334-337
[256] 2 CFR §§ 200.334-337

The letter must include:

- A final accounting of eligible management costs. In addition, as cost underruns are identified, the recipient must submit de-obligation requests to FEMA.
- Documentation for cost share (FMA only).
- Confirmation that recipient has time and attendance records on file. The actual records do not need to be sent to FEMA; however, FEMA must confirm they are retained.
- A statement confirming that additional supporting documentation for management costs expenditures is available upon request.

The recipient must liquidate all obligations incurred under the period of performance no later than 120 calendar days after the period of performance expiration, unless FEMA authorizes an extension. FEMA will de-obligate any assistance not liquidated by the recipient.

C.3.1. RECIPIENT MANAGEMENT COSTS ADMINISTRATIVE PLAN REQUIREMENTS

For HMGP and HMGP Post Fire, costs incurred must comply with the procedures outlined in the recipient's HMGP and HMGP Post Fire Administrative Plan.

FEMA reviews the supporting documentation for personnel costs and validates those costs across all open HMGP and HMGP Post Fire disasters administered by the recipient. This review is done to verify that employees' salaries, contractor costs and actual costs paid from disaster awards are the following:

- Distributed equitably and do not exceed 100%.
- Equivalent to salaries paid in similar positions for non-federal awards.
- Not duplicating direct or management costs provided under subawards.
- In support of activities described in the recipient's request for management cost assistance.

The recipient must submit form SF-428 if applicable. If not applicable, a statement must be included in the closeout cover letter.

C.3.2. RECIPIENT MANAGEMENT COSTS RECORDS RETENTION

Financial records, supporting documents, statistical records and all other recipient records pertinent to management costs must be retained for at least three years from the submission of the final expenditure report. Exceptions that may extend the retention period are defined in 2 CFR § 200.334.

C.4. Recipient Award Closeout and Liquidation Time Frames

The recipient has up to 120 calendar days following the award period of performance's expiration to submit all financial, progress and other reports required by FEMA.[257] Additionally, unless FEMA authorizes an extension, the recipient must liquidate all financial obligations incurred under the federal award no later than 120 calendar days after the end date of the award period of performance.[258] All administrative actions for which the recipient is claiming costs must be completed during the award period of performance, except the actual submission of the required reports. Any payment made beyond the closeout and liquidation end date, for eligible costs incurred during the period of performance, is considered an improper payment. If the recipient needs additional time to liquidate eligible costs incurred during the period of performance, they may request a closeout and liquidation extension.

The recipient must complete the following activities to close out the award:

- Ensure all subawards have been closed out.
- Reconcile/adjust subaward costs, ensuring that non-federal share costs are documented, and that all costs submitted are eligible according to the FEMA-approved scope of work.
- Receive and process cost adjustments or return unobligated assistance to FEMA via SMARTLINK or PARS. FEMA makes the final payment to the recipient.
- Notify FEMA that the award is ready for final closeout.

By the end of the closeout and liquidation period, the recipient must submit the following to FEMA:

- A closeout letter signed by the governor's authorized representative, tribal authorized representative or an executive authorized signature authority to FEMA with supporting documentation, including:
  - A statement that the scopes of work have been completed as approved.
  - SF-425 (for PARS, the final SF-425 is also submitted via PARS).
  - SF-270, *Request for Advance or Reimbursement*, if applicable, or request for de-obligation of unused assistance, if applicable.
  - SF-428, if applicable.
  - SF-429, "Real Property Status Report," if applicable.

[257] 2 CFR § 200.344(a)
[258] 2 CFR § 200.344(b)

- A statement that no inventions were made, nor patents applied for in the implementation of the award.
- Other documents required by applicable laws and regulations, the HMA Guide or NOFO, terms and conditions of the award, or other FEMA guidance.

An inventory of all construction projects that used funds from this program must be reported with the final progress report.

The closeout submission will not be considered an official submission without the signed statement from the governor's authorized representative, tribal authorized representative or an executive authorized signature authority,

C.4.1. ADMINISTRATIVE CLOSEOUT

If a recipient is unable to meet the standard closeout requirements (e.g., unable to fulfill non-federal cost share match requirements), the governor's authorized representative, tribal authorized representative or an executive authorized signature authority must request an administrative closeout in writing to the FEMA regional administrator. The letter must identify the reason for the recipient's request.

FEMA may initiate an administrative closeout because of the recipient's failure to perform in accordance with the terms of the award or submit required final reports within one year of the period of performance end date. After all reasonable efforts to secure the final reports (both financial and program) are exhausted, FEMA will initiate an administrative closeout.[259] If FEMA needs to administratively close an award, it may negatively impact a recipient's ability to obtain future funding. This mechanism can also require FEMA to make cash or cost adjustments and ineligible cost determinations based on the information it has, which may result in identifying a debt owed to the agency by the recipient.

The administrative closeout process permits FEMA to close an award using available financial and programmatic information in lieu of final reports. FEMA will initiate an administrative closeout when a recipient is not responsive to reasonable efforts the agency makes to collect required reports needed to complete the standard process. FEMA initiates an administrative closeout through formal correspondence that provides notice of how the agency intends to proceed. If the recipient submits all required documents prior to the completion of the administrative closeout process, FEMA may use those documents to conduct a standard closeout.

FEMA's decision to enforce an administrative closeout may result in additional enforcement actions, including disallowance of costs or enhanced oversight of other current awards to the same recipient. FEMA must report the recipient or subrecipient's material failure to comply with the terms and conditions of the award with the OMB-designated integrity and performance system (currently

[259] 2 CFR § 200.344(h) and (i)

FAPIIS).[260] Failure to comply with such reporting requirements may be considered in FEMA's oversight of other current and future awards to the same recipient, including in the agency's pre-award review of a recipient's risk for non-compliance.[261] FEMA staff may impose remedies for non-compliance for the recipient's other awards.[262] Remedies can include but are not limited to placing special conditions on future awards, enhanced monitoring, or both.

C.4.2. RECIPIENT RECORDS RETENTION

The recipient must maintain the complete federal award closeout records file for at least three years from the submission date of its final expenditure report.[263] The records retention period may be longer because of an audit or litigation, equipment or real property being used beyond the period of performance, or other circumstances.[264] FEMA recommends that recipients remind subrecipients of the three-year records retention requirement and communicate the submission date of the final expenditure reports to the agency.

FEMA retains the right to disallow costs and recover assistance based on a later audit or other review after closeout. FEMA must make any cost disallowance determination and notify the pass-through entity within the records retention period.

C.4.3. UPDATE OF REPETITIVE LOSS DATABASE

FEMA will update the NFIP Repetitive Loss Database as project activities are completed. For acquisition and demolition or relocation projects, recipients must provide an update when there is no longer an insurable structure on the property. For elevation, reconstruction, floodproofing and localized flood risk reduction projects, recipients must provide an update when the approved activity is complete or otherwise effective.

The NFIP defines a repetitive loss structure as any insurable building for which the NFIP paid two or more claims of more than $1,000 within any rolling 10-year period since 1978. At least two of the claims must be more than 10 calendar days apart but within 10 years of each other. The NFIP may or may not currently insure a repetitive loss structure.[265]

The NFIP definition of a repetitive loss structure described in this section is different from the FMA definition following the passage of the Biggert-Waters Flood Insurance Reform Act of 2012.[266] Refer to Part 10.D for more information.

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[260] 2 CFR § 200.344(i)
[261] 2 CFR § 200.206
[262] 2 CFR § 200.339, 2 CFR § 200.206
[263] 2 CFR §§ 200.334-337
[264] 2 CFR § 200.344
[265] FEMA. (2022, Oct.). National Flood Insurance Program: Flood Insurance Manual.
[266] Public Law 112-141 (July 6, 2012); Section 100205

D. Identification and Collection of Monies Owed

FEMA has a responsibility to recover from the recipient any assistance inappropriately paid for disallowed costs under its grant awards. This recovery may result from overestimates or underruns on approved costs or from identifying amounts paid for costs that were unallowable because of ineligibility, unreasonable costs or other reasons. Funds owed to FEMA also include monies generated under the award or for income associated with the sale, lease or loan of federal property. FEMA may identify and collect monies owed under a grant award at any time during the lifecycle of an award, not just because of closeout.[267] If the administering office cannot resolve amounts owed under routine administrative processes, it must refer the matter to the FEMA Finance Center to pursue debt collection. When necessary, the FEMA Finance Center refers debt to the Department of Treasury for collection purposes.

E. Supplies and Equipment

In general, title to supplies and equipment that the non-federal entity purchases with FEMA assistance vests in the non-federal entity. The non-federal entity must use the supplies or equipment for the authorized program or activity purpose as long as is needed and in accordance with 2 CFR § 200.313 and 2 CFR § 200.314.

F. Disposition of Purchased Equipment and Supplies

This section describes disposition requirements when purchased equipment or supplies (including materials) are no longer needed for federally funded activities. In the context of disposition, equipment is any tangible personal property (including information technology systems) having a useful life of more than one year and a per-unit acquisition cost that equals or exceeds the lesser of the capitalization level established by the non-federal entity for financial statement purposes, or $5,000.[268] Tangible personal property that does not fall under this definition of equipment is a supply.[269] When equipment or supplies (including materials) purchased with HMA are no longer needed for HMA activities, the non-federal entity may use the items for other federally funded programs or activities, provided the recipient informs FEMA.[270]

F.1. Disposition of Purchased Equipment

In accordance with federal regulations, state, local, tribal and territorial non-federal entities must dispose of equipment in accordance with state, local, tribal and territorial government laws and procedures.[271] All other non-federal entities must follow the requirements of 2 CFR § 200.313.

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[267] For information on how to make a payment to FEMA, refer to the "How to Pay FEMA" webpage.
[268] 2 CFR § 200.1
[269] 2 CFR § 200.1
[270] 2 CFR § 200.313(c)
[271] 2 CFR § 200.313(b)

When equipment purchased with HMA is no longer needed for mitigation activities, tribal and local governments and private nonprofit organizations may use the items for other federally funded programs or activities.[272]

When an individual item of equipment is no longer needed for federally assisted programs or activities, tribal and local governments and private nonprofit organizations must calculate the current fair market value of each item of equipment. The recipient/subrecipient must provide the current fair market value for any item with a current fair market value of $5,000 or more. FEMA reduces eligible assistance by this amount.[273] If an individual item of equipment has a current fair market value of less than $5,000, FEMA does not reduce the eligible assistance.[274] Tribal and local government and private nonprofit organizations must comply with all disposition requirements in 2 CFR § 200.313(e).

F.2. Disposition of Purchased Supplies

When supplies are no longer needed for federally assisted programs or activities, all non-federal entities, including state and tribal governments, must calculate the current fair market value of any unused residual supplies (including materials) that FEMA assisted with for any of its activities and determine the aggregate total. The non-federal entity must provide FEMA with the current fair market value if the aggregate total of unused residual supplies is greater than $5,000. FEMA reduces eligible assistance by this amount.[275] If the aggregate total of unused residual supplies is less than $5,000, FEMA does not reduce the eligible assistance.

G. Disposition of Real Property

If a non-federal entity acquires or improves real property with assistance from an HMA program, the non-federal entity must follow the disposition and reporting requirements when the acquired or improved real property is no longer needed for the originally authorized purpose.[276] Real property is broadly defined to include land, land improvements, structures and any attachments to the land or structures.[277] Structural hazard mitigation measures applied to land or structures generally constitute improvements to real property.

G.1. Disposition Requirements by Project Type

The real property reporting and disposition standards apply to the following types of HMA projects, for the useful life of the real property, that the non-federal entity acquires or improves:

[272] 2 CFR § 200.313(c)
[273] 2 CFR § 200.313(e)(2)
[274] 2 CFR § 200.313(e)(1)
[275] 2 CFR § 200.314(a)
[276] 2 CFR § 200.311, 2 CFR § 200.329
[277] 2 CFR § 200.1

- **Community safe rooms and tsunami vertical evacuation refuge**: The retrofit of an existing facility or construction of a new community safe room or tsunami vertical evacuation refuge, which are intended to protect a specific population, are considered improvements to real property.

- **Property acquisition**: To acquire property to be dedicated and used in perpetuity for open space for the conservation of natural floodplain functions. Because the non-federal entity acquires title to the property, the non-federal entity must comply with the property standards and reporting requirements. To the extent that FEMA's regulations for property acquisition and relocation for open space in 44 CFR Part 80 differ from the disposition and reporting requirements in 2 CFR § 200.311 and 2 CFR § 200.330, FEMA's regulations at 44 CFR Part 80 govern.

- **Other mitigation measures**: Mitigation reconstruction, structure elevations, flood risk reduction measures, non-residential building floodproofing and retrofitting are considered improvements to real property.

G.2. Exceptions

The real property reporting and disposition standards do not apply to the following types of HMA projects:

- **Residential safe rooms**: Individuals are not subject to the requirements of 2 CFR Part 200; therefore, the disposition and reporting requirements do not apply to safe rooms meant for individuals or families (e.g., safe rooms installed in single-family dwellings).

- **Wildfire mitigation**: The property standards will not typically apply to wildfire mitigation projects that do not improve real property.

- **Warning systems**: The property standards will not typically apply to warning system projects.

H. Audits

Recipients and subrecipients are subject to federal and non-federal audits.[278] Records are subject to audits by state or territorial auditors, FEMA, the Department of Homeland Security Office of Inspector General and the Government Accountability Office.[279] FEMA may adjust activity assistance as the result of audit findings.

[278] 2 CFR § 200. 501
[279] 44 CFR § 206.16

H.1. Single Audits

A recipient or subrecipient that expends $750,000 or more from all federal funding sources during their fiscal year is required to submit an organization-wide financial and compliance audit report, also known as a single audit report.[280]

Recipients must comply with procedures for compliance with audit requirements of the Government Accountability Office's government auditing standards codified in the Yellow Book,[281] 2 CFR Part 200, Subpart F and all other applicable statutes and regulations.

For single audits of recipients, a FEMA project officer will be assigned to follow up on audit findings and issue management decisions for associated corrective actions. For single audits of subrecipients, the recipient must follow up on audit findings and issue management decisions for associated corrective actions.

For single audits, the auditee is required to prepare financial statements reflecting their financial position, a schedule of federal award expenditures and a summary of the status of prior audit findings and questioned costs. The auditee must also follow up and take appropriate corrective actions on new and previously issued but not yet addressed audit findings.[282] The auditee must prepare a corrective action plan according to 2 CFR § 200.1 and 2 CFR § 200.511.

H.2. Government Accountability Office

The Government Accountability Office is the investigatory arm of Congress and is under the direction of the Comptroller General of the U.S. The Government Accountability Office is an independent, nonpartisan agency that investigates how the federal government spends taxpayer dollars. Its mission is to help improve the performance and accountability of the federal government.

H.3. Office of the Inspector General

The Department of Homeland Security, Office of Inspector General conducts independent audits and investigations on FEMA programs, operations, activities and functions as well as recipient and subrecipient expenditures of federal assistance. The Office of Inspector General evaluates activities to identify, deter and address fraud, waste and abuse. The Office of Inspector General also provides oversight of non-federal audits such as single audits and has the authority to audit any activity funded with HMA.

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[280] 2 CFR § 200.501, 44 CFR § 206.438(e)

[281] The Yellow Book is used by auditors of government entities, entities that receive government awards and other audit organizations. The Yellow Book is available on the Government Accountability Office's website at: https://www.gao.gov/yellowbook

[282] 2 CFR § 200.508, 2 CFR § 200.510, 2 CFR § 200.511

H.4. Recovery of Improper Payments

FEMA conducts audit assessments on high-dollar drawdowns to recover payments identified as improper as required by the Payment Integrity Information Act of 2019.[283]

Award-specific activities include requesting that recipients provide supporting documentation for specific payment requests made on specific dates. Recipient participation in the review is required under the terms and conditions of the grant agreement.

FEMA will initiate recoupment when it identifies non-compliance and when the matter cannot be corrected, an amount is potentially owed and funds have been drawn down (refer to Part 9.B.2 and Part 9.D). FEMA will process a de-obligation after the recipient has reimbursed the amount of the improper payment.

I. Forms

FEMA maintains multiple forms that OMB must review and approve through the Paperwork Reduction Act process.[284] FEMA generally reviews information collections every three years or earlier if program statutes or regulations require updates. The HMA Guide references the approved forms at the time of publication. Any updates to forms may be published on fema.gov.

Recipients seeking to use different forms than provided by FEMA must gain prior agency approval. Recipients must include forms in their FEMA-approved HMGP Administrative Plan. Plans can be submitted at any time and can be updated to include BRIC and FMA grants management activities.

FEMA publishes select forms on fema.gov for use by applicants and subapplicants, which can be found via the "Hazard Mitigation Assistance Guidance" webpage.

Additionally, FEMA uses certain federally maintained forms for HMA programs. Standard federal forms for grant applications can be found via the grants.gov Forms Repository.

Commonly used forms include:

- Application for Federal Assistance (SF-424).
- Budget Information for Non-Construction Programs (SF-424A).
- Assurances for Non-Construction Programs (SF-424B).
- Budget Information for Construction Programs (SF-424C).

[283] Public Law 116-117 (March 2, 2020)
[284] Public Law 104-13 (May 22, 1995)

- Assurances for Construction Programs (SF-424D)
- Disclosure of Lobbying Activities (SF-LLL).

J. Additional Award Administration and Requirements Resources

Table 10: Closeout Toolkit: Checklist for Hazard Mitigation Assistance Subawards

Minimum Requirement	Comments and Documentation Source
General for Mitigation Activities	
Was an exception to the plan requirement granted for this project under extraordinary circumstances? If yes, was the plan completed, approved by FEMA including adoption by the jurisdiction within 12 months as required?	
Was the activity completed within the award's established period of performance?	
Were there approved requests for period of performance extensions?	
Were costs incurred after the period of performance expired?	
Was a duplication of benefits search completed to ensure the subrecipient did not receive federal assistance for the same purpose from another source (e.g., Increased Cost of Compliance, Individual Assistance) (excluding non-construction subawards)?	
Was a duplication of programs search completed to verify the subrecipient did not receive federal assistance for the same purpose from another source (e.g., previous HMGP, HMGP Post Fire, BRIC or FMA grants; NFIP; Public Assistance; or other federal agencies) (excluding non-construction activities identified in Part 11)?	

Minimum Requirement	Comments and Documentation Source
Was the final Quarterly Progress Report submitted with the closeout request?	
Did the recipient perform a site inspection visit of the completed project and provide a copy of the site inspection report with the closeout request (excluding non-construction activities identified in Part 11)?	
Did the recipient provide photographs of the completed project to compare with the pre-mitigation photos (excluding non-construction activities identified in Part 11)? Photos must be clearly labeled with the FEMA project number, subrecipient name and address, and latitude/longitude (to the nearest sixth decimal place).	
Did the governor's authorized representative, tribal authorized representative or an executive authorized signature authority certify that reported costs were incurred in the performance of eligible work, that the approved work was completed, and that the mitigation measure follows the provisions of the FEMA-State Agreement/FEMA-Tribal Agreement?	
Were special EHP compliance conditions identified as part of the approved scope of work? If yes, did the recipient document in the closeout package that the project was completed in compliance with all EHP conditions identified in the approval letter/attachments and/or the electronic application system?	

Minimum Requirement	Comments and Documentation Source
Did the recipient certify that the entire project was completed in accordance with all required permits and building codes and standards (if applicable)?	
Did the recipient provide the latitude and longitude to the nearest sixth decimal place for each project site (e.g., for each property, segment or location) (excluding non-construction activities identified in Part 11)?	
Are there insurable structures remaining in the Special Flood Hazard Area after project completion? If yes, did the recipient provide proof of insurance?	
Cost Review	
Were the final expenditures reported consistent with the approved costs?	
Did the actual reimbursements match the reported sum of expenditures?	
Has the recipient met the cost share requirement?	
Were in-kind third-party contributions identified under the subaward? If yes, did the subrecipient obtain prior approval?	
If additional costs were incurred, was prior approval obtained?	
Was expendable and non-expendable equipment purchased or federally owned equipment furnished? If yes, *Tangible Personal Property Report* (SF-428) must be provided.	

Minimum Requirement	Comments and Documentation Source
Was program income generated under the project? If yes, did the recipient deduct program income from the total project costs?	
Was interest earned on federal advance payments? If yes, was interest returned to the Department of Treasury according to the applicable regulation for the disaster?	
Additional closeout requirements for each mitigation activity/project type can be found in Part 11 and Part 12.	

Award Monitoring and Closeout Resources

- SF-428, *Tangible Personal Property Report*: https://www.grants.gov/web/grants/forms/post-award-reporting-forms.html
- *Closeout Toolkit: Checklist for Hazard Mitigation Grant Program Subawards*: https://www.fema.gov/sites/default/files/2020-09/fema_closeout_toolkit_checklist_hazard_mitigation_grant_program_subawards_02-19-15.pdf
- *Closeout Toolkit: Hazard Mitigation Grant Program Subaward Closeout FAQs*: https://www.fema.gov/sites/default/files/documents/fema_closeout-toolkit-hazard-mitigation-grant-program-subaward-closeout-faqs.pdf

Part 10. Program-Specific Guidance

This part provides additional information applicable to assistance available under each Hazard Mitigation Assistance (HMA) program: Hazard Mitigation Grant Program (HMGP), Hazard Mitigation Grant Program Post Fire (HMGP Post Fire), Building Resilient Infrastructure and Communities (BRIC) and Flood Mitigation Assistance (FMA). This section supplements the grant application and management information provided in Part 1 through Part 9 and the unique activity type guidance in Part 11, Part 12 and Part 13. This part does not provide all necessary information to apply for assistance through the HMA programs and must be read in conjunction with other relevant sections of the guidance, as well as relevant Notices of Funding Opportunity (NOFO).

A. Hazard Mitigation Grant Program

This section contains supplemental guidance specific to HMGP and outlines the information necessary for both the applicant and subapplicant to apply for and manage HMGP awards.

A.1. HMGP: Request for Assistance

HMGP is authorized through a major disaster declaration. A governor,[285] tribal chief executive, or equivalent, may request that HMGP assistance be available throughout the state, local, tribal or territorial area or only in specific jurisdictions. Federally recognized tribes, through their tribal chief executive,[286] may also submit a request for a disaster declaration within their impacted areas and request that HMGP funding be made available to them under that declaration. For more information about the declaration process and authorization of HMGP, refer to 4 Code of Federal Regulations (CFR) Part 206, Subpart B, visit the Federal Emergency Management Agency (FEMA) "How a Disaster Gets Declared" webpage, or seek assistance from the appropriate FEMA regional office.

The governor's authorized representative or tribal authorized representative serves as the grant administrator for all assistance provided under HMGP.[287] The governor's authorized representative, tribal authorized representative or an executive authorized signature authority's responsibilities include providing technical advice and assistance to eligible subapplicants and/or subrecipients and ensuring all potential subapplicants are aware of available assistance for the submission of all documents necessary for the award.

A signed FEMA-State Agreement or FEMA-Tribal Agreement is required to carry out HMGP under a disaster declaration. After execution of the agreement, the applicant becomes the recipient.

[285] 42 United States Code (U.S.C.) § 5122(5)
[286] 42 U.S.C. § 5122(12)
[287] 44 CFR § 206.436(b)

A.2. HMGP: Administrative Plan

The HMGP Administrative Plan (Administrative Plan) is a procedural guide that details how the recipient will administer HMGP awards and subawards. Recipients must have a current Administrative Plan approved by FEMA before receiving HMGP assistance. The Administrative Plan may become an annex or chapter of the state's or tribe's overall emergency response and operations plan or comprehensive mitigation program strategy. At a minimum, the Administrative Plan must:

- Designate the agency that will act as recipient.
- Identify the applicant's hazard mitigation officer or designated representative.
- Identify staffing requirements and resources, including a procedure for expanding staff temporarily following a disaster, if necessary.
- Establish procedures to guide implementation activities, including recipient management costs and distribution of subrecipient management costs.
- Establish procedures for monitoring and reporting on subrecipient management costs.
- Comply with any other requirements outlined in 44 CFR § 206.437.

Recipients must complete the HMGP Administrative Plan Checklist and submit for FEMA's review as part of the review of the plan.

A.2.1. HMGP: ADMINISTRATIVE PLAN DESIGNATION OF RECIPIENT AND HAZARD MITIGATION OFFICER

Typically, the agency designated to act as the recipient (i.e., state, tribe or territory) manages the responsibilities for federal and state/tribal/territorial disaster assistance and is responsible for meeting the mitigation planning requirement. Although a single agency may administer the assistance, the governor may establish an interagency mitigation team to manage the state/tribal/territorial mitigation program.

The recipient's hazard mitigation officer, or designated representative, is typically responsible for managing the recipient's mitigation program, coordinating the mitigation team and developing and implementing the hazard mitigation plan. The recipient's hazard mitigation officer must also make funds available for planning and provide assistance and training to local governments applying for funds and developing mitigation plans.[288] Recipients often rely on staff from the emergency management agency or other state or tribal agencies to be the hazard mitigation officer's staff following a disaster.

[288] 44 CFR § 201.3

A.2.2. HMGP: ADMINISTRATIVE PLAN STAFFING REQUIREMENTS AND THE MITIGATION TEAM

The Administrative Plan must identify the positions and the minimum number of personnel needed to implement HMGP. Key positions may include clerical, administrative and financial managers; grants managers; engineers and/or architects; and mitigation, community and environmental planners. These positions support mitigation planning and administration and the implementation of mitigation activities. However, the staff organizational structure should remain flexible as it may be augmented as needed with emergency management agency staff, staff from other agencies or temporary staff or contractors hired to administer HMGP effectively. The hazard mitigation officer should build capacity and resilience by using both community and mitigation planners. The Administrative Plan should include a procedure for expanding staff resources and using HMGP management costs.

The mitigation team may include representatives of agencies involved with emergency management, natural resources, floodplain management, environmental issues, historic preservation and archaeology, soil conservation, transportation, planning and zoning, housing and economic development, building regulations, infrastructure regulations or construction, public information, insurance, regional and local government, academia, businesses and nonprofit organizations. With the varied backgrounds and specialized expertise of members, the team creates interagency, interdisciplinary insight regarding risks and potential solutions. The interagency aspect of the team can diffuse political pressure on the recipient agency and increase the availability of resources.

The mitigation team may support the recipient agency by:

- Developing a comprehensive mitigation implementation strategy based on the FEMA-approved mitigation plan.
- Supporting development and implementation of state, local, tribal and territorial mitigation plans.
- Communicating with local governments regarding mitigation priorities found in mitigation plans and updates based on the disaster activity.
- Coordinating with community planning and capacity-building, recovery planning, HMGP and Public Assistance mitigation.
- Building public and business/industry support for mitigation initiatives.
- Reviewing, assigning priority and recommending mitigation actions for implementation.
- Seeking assistance for implementation of mitigation measures using a wide range of public and private resources in accordance with the National Mitigation Investment Strategy.

A.2.3. HMGP: ADMINISTRATIVE PLAN PROCEDURES TO GUIDE IMPLEMENTATION ACTIVITIES

The Administrative Plan must establish procedures to:

- Identify and notify potential subapplicants of the availability of HMGP assistance.
- Provide potential subapplicants with information on the application process, management costs, program eligibility and deadlines.
- Determine subapplicant eligibility.
- Provide information, training and technical assistance on mitigation planning requirements.
- Provide information for environmental and historic preservation (EHP) and floodplain management reviews in conformance with FEMA Directive 108-1, *Environmental Planning and Historic Preservation Responsibilities and Program Requirements* (Oct. 10, 2018).
- Process requests for advances of assistance and reimbursements.
- Monitor and evaluate the progress and completion of mitigation activities.
- Monitor subrecipient management costs.
- Review and approve cost overruns.
- Process appeals.
- Provide technical assistance as required to subrecipients.
- Comply with the administrative requirements of 44 CFR § 206.437 and 2 CFR Part 200.
- Comply with audit requirements of 2 CFR Part 200, Subpart F.
- Provide Quarterly Progress Reports to FEMA on mitigation activities.

A.2.4. HMGP: ADMINISTRATIVE PLAN SUBMISSION AND APPROVAL DEADLINE

A recipient may forward a new or updated Administrative Plan to FEMA for approval at any time. A recipient should review and update their plan annually and must review and update the plan following a major disaster declaration if required to meet current policy guidance or changes to the administration of the program. If a review indicates there will be no changes to the current Administrative Plan, the recipient should notify FEMA within 90 calendar days of the major disaster declaration.

A.3. HMGP: Eligibility

Refer to Part 4 for details regarding HMGP eligible applicants, eligible subapplicants and eligible activities.

As described in Part 4, private nonprofit organizations may act as the subapplicant for HMGP if they own or operate a private nonprofit facility.[289] A qualified conservation organization as defined in 44 CFR § 80.3(i), is the only private nonprofit organization (that does not own or operate a nonprofit facility) that is eligible to apply for acquisition or relocations for open space projects.[290]

A.4. HMGP: Assistance Estimates

The amount of HMGP funding available to the applicant is based on the estimated total federal assistance, subject to the sliding scale formula that FEMA provides for disaster recovery for each disaster declaration. [291]

FEMA will determine the assistance it will make available for HMGP by a "lock-in," which will act as a ceiling for assistance available to a recipient, including its subrecipients. The level of HMGP assistance available for a given disaster is based on a percentage of the estimated total federal assistance under the Robert T. Stafford Disaster Relief and Emergency Assistance Act (Stafford Act),[292] excluding administrative costs for each major disaster declaration.[293]

FEMA will provide an initial 30-day estimate within 35 calendar days of the major disaster declaration or soon thereafter, in conjunction with calculation of the preliminary amount(s) for management costs. FEMA will provide a revised estimate approximately six months after the major disaster declaration.

FEMA will establish the HMGP assistance ceiling for each disaster 12 months after the major disaster declaration. This amount, also known as the lock-in value for HMGP, is the maximum FEMA can obligate for eligible HMGP activities. The Office of the Chief Financial Officer (OCFO) will continue to provide HMGP estimates before 12 months; however, these estimates will not represent a minimum or floor amount.

Prior to 12 months, total obligations are limited to no more than 75% of any current estimate. Any obligations above 75% of the current estimate prior to 12 months will require concurrence from the FEMA regional administrator (or federal coordination officer with disaster recovery manager authority) and the FEMA OCFO.

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[289] 44 CFR § 206.434
[290] 44 CFR § 206.434(a)(2)
[291] 44 CFR § 206.432(b)
[292] Public Law 100-707 (Nov. 23, 1988); amending the Disaster Relief Act of 1974, Public Law 93-288 (May 22, 1974)
[293] 44 CFR § 206.432(b)

In circumstances when a major disaster declaration has resulted in significant fluctuations of projected or actual disaster costs, FEMA, at the request of the recipient, may conduct an additional review after the 12-month lock-in. The recipient must justify in writing to the FEMA regional administrator any requests to change the amount of the lock-in or perform subsequent reviews. The regional administrator will recommend to the OCFO whether to approve the change.

Changes to the lock-in will not be made without the approval of the OCFO. The OCFO may change the amount of the lock-in if they determine that the projections or actuals used to determine the lock-in were inaccurate enough that the change to the lock-in would be material, or for other reasons in their discretion that may reasonably warrant such changes. The OCFO will not make such changes without consultation with the recipient and the regional administrator.

FEMA cannot reopen the application period after it has closed even if there is an increase to the ceiling amount. Any assistance for mitigation activities approved and obligated before the 12-month lock-in will not be de-obligated when the lock-in is less than the previous estimate. Figure 7 outlines the HMGP ceiling review process. For more information on extension requests, refer to Part 6.

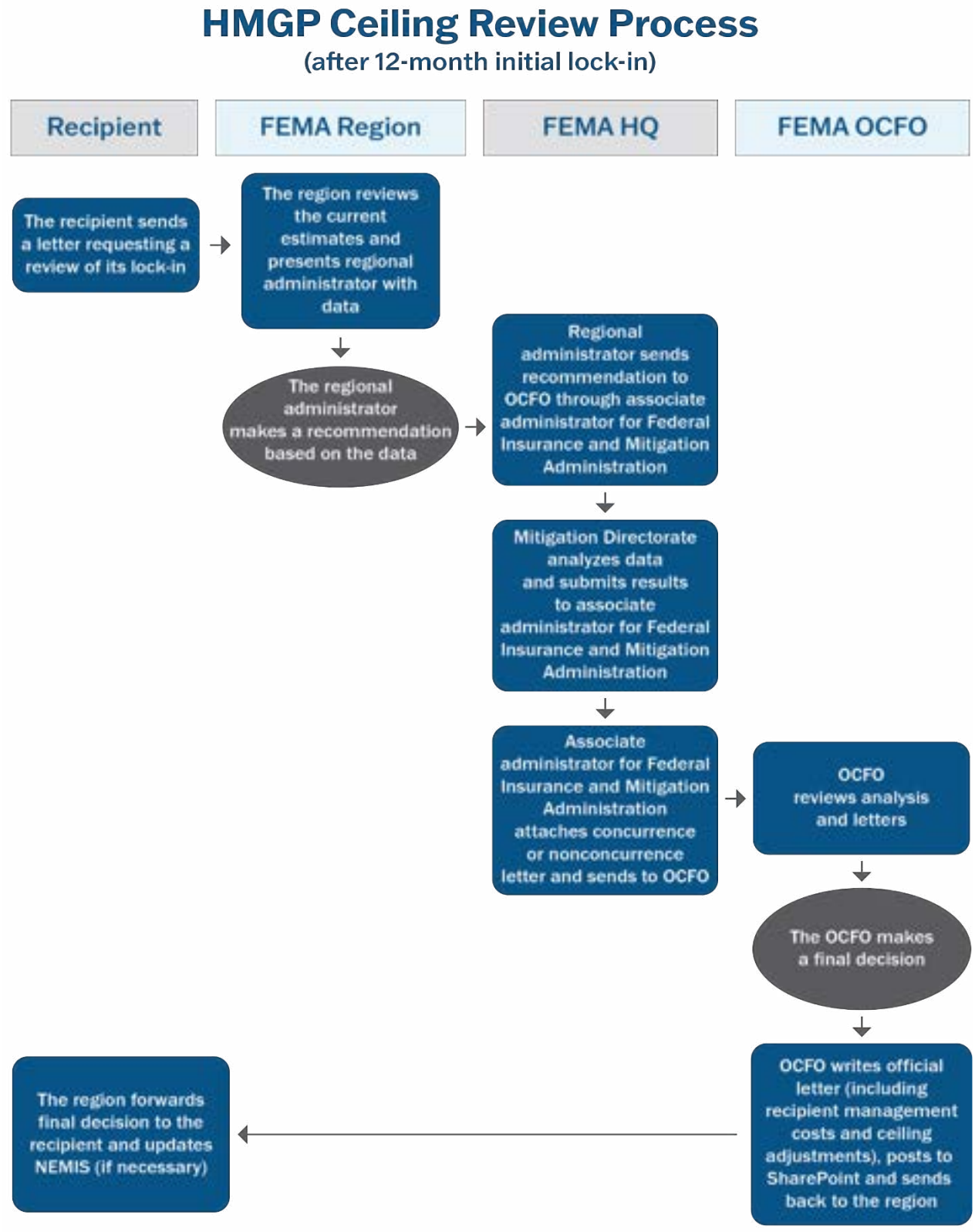

Figure 7. HMGP Ceiling Review Process

A.5. HMGP: Assistance Sliding Scale

The maximum amount of HMGP assistance available is calculated using a sliding scale formula based on a percentage of the estimated total federal assistance under the Stafford Act, excluding administrative costs for each major disaster declaration.

Applicants with a FEMA-approved state or tribal mitigation plan may receive:

- Up to 15% of the first $2 billion of the estimated aggregate amount of disaster assistance.
- Up to 10% for the next portion of the estimated aggregate amount more than $2 billion and up to $10 billion.
- Up to 7.5% for the next portion of the estimated aggregate amount more than $10 billion and up to $35.333 billion.

Applicants with a FEMA-approved state or tribal enhanced mitigation plan are eligible for HMGP assistance not to exceed 20% of the estimated total federal assistance under the Stafford Act, up to $35.333 billion of such assistance, excluding administrative costs authorized for the disaster. Figure 8 highlights how the HMGP funding ceiling is generally calculated.

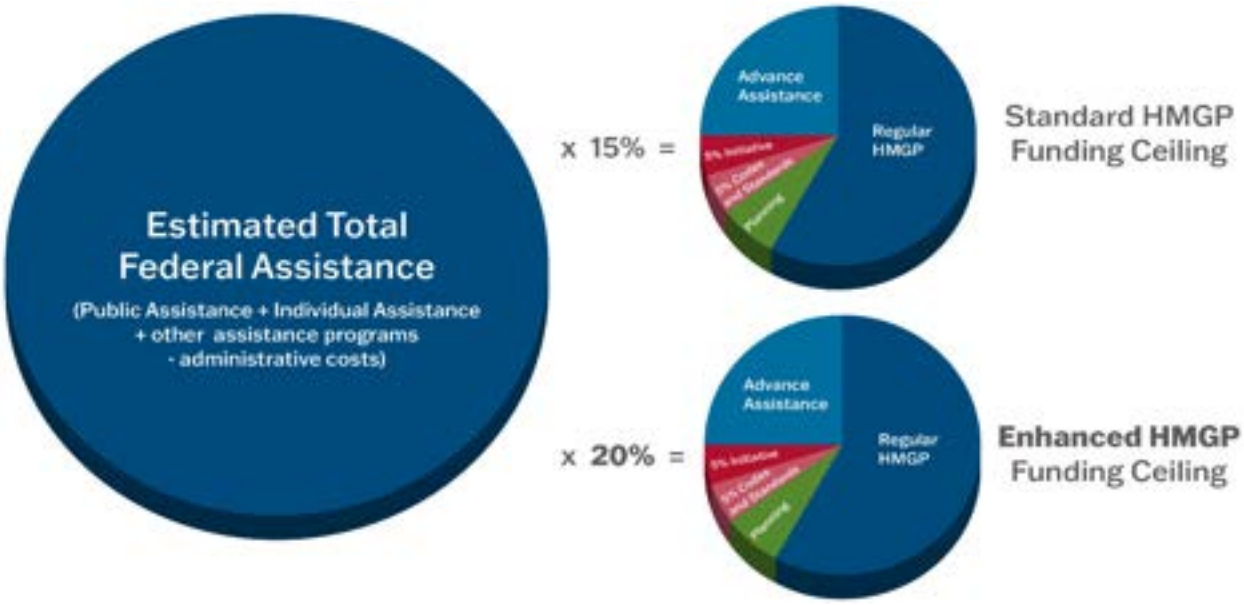

Figure 8. Standard Versus Enhanced Mitigation Plans Under HMGP

A.6. HMGP: Apportionment

The amount of HMGP assistance available under the disaster declaration will be apportioned among the applicants if there is more than one applicant. For example, if a state and a federally recognized tribe are applicants under the same disaster declaration, then the available HMGP assistance will be

apportioned among the state and the federally recognized tribe. The apportionment is based on the damage the tribe sustained on tribal land from the disaster.

A.7. HMGP: Timing of Obligation of Assistance

HMGP funds may be obligated for subawards submitted during the open application period and, in limited circumstances, when the application period is closed and the period of performance is open for cost overruns, budget changes, some project modifications or schedule changes. HMGP funds must not, however, be obligated to fund new projects or scope expansions of the original projects that may result in a new project. HMGP funds cannot be obligated for mitigation activities after the application period and the period of performance have closed (i.e., during closeout and after closeout of the award).

A.8. HMGP: Assistance Restrictions

Assistance restrictions are caps or restrictions on the amount of assistance that applicants may use for specific activities under the HMGP ceiling amount. HMGP assistance restrictions include the following:

- **Advance assistance**: Advance assistance is authorized by Section 404(e) of the Stafford Act,[294] which allows advancing up to 25% of the HMGP ceiling or $10 million, whichever is less. For more detail, refer to Part 11.B.
- **5 Percent Initiative**: Up to 5% of the recipient's HMGP ceiling may be used for mitigation measures that are difficult to evaluate against traditional program cost-effectiveness. For more detail, refer to Part 10.A.8.1.
- **7 Percent planning**: Up to 7% of the recipient's HMGP ceiling may be used for mitigation planning activities in compliance with 44 CFR 201.3(c)(4). For more detail, refer to Part 11.A.3.3.1.
- **5 Percent Codes and Standards**: Up to 5% of the recipient's HMGP ceiling may be used for codes and standards mitigation activities. For more detail, refer to Part 11.E.2.4.1.

Figure 9 highlights how HMGP is broken down.

[294] 42 U.S.C. § 5170c

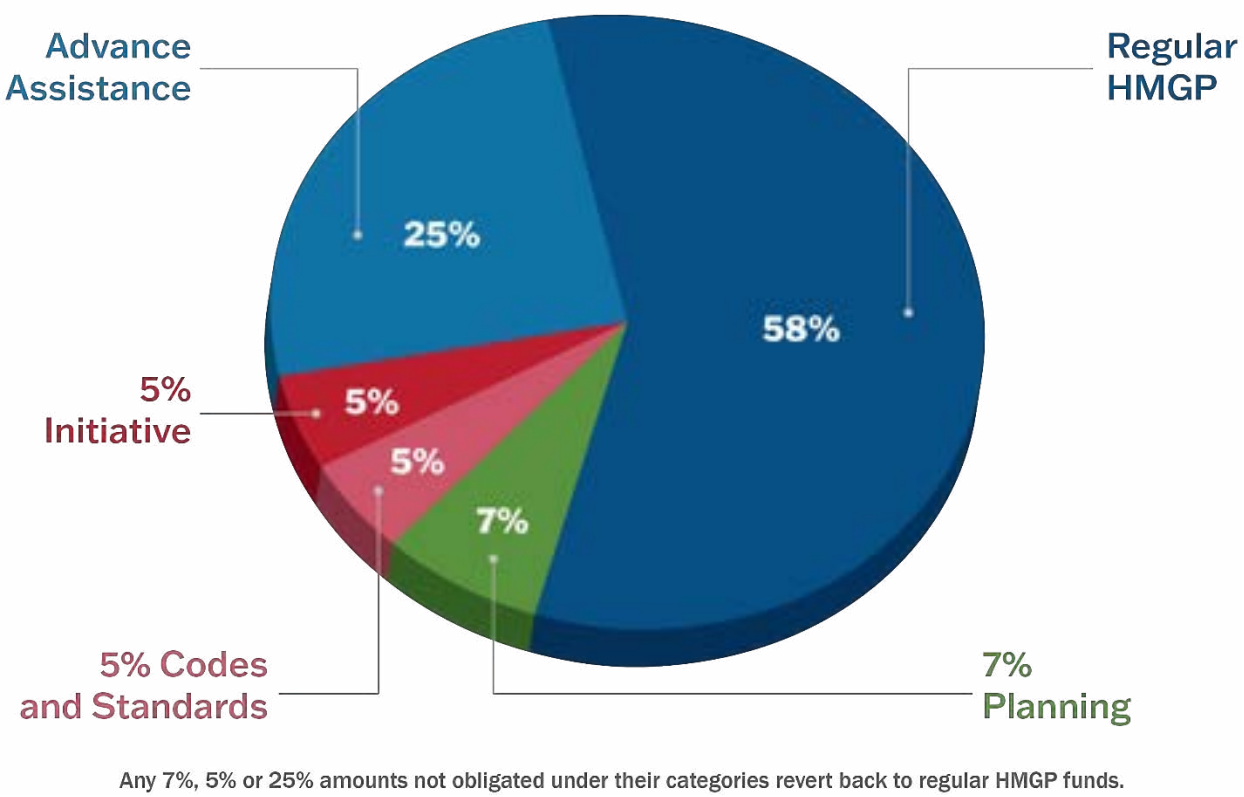

Figure 9. HMGP Funding Breakdown

A.8.1. HMGP: THE 5 PERCENT INITIATIVE

Some mitigation activities are difficult to evaluate using FEMA-approved cost-effectiveness methodologies. Up to 5% of the recipient's HMGP ceiling may be set aside by the recipient to pay for such activities. The 5 Percent Initiative funds cannot be used in situations where mitigation activities can be evaluated under FEMA-approved cost-effectiveness methods but do not meet the required Benefit-Cost Ratio.

A.8.1.1. HMGP: 5 Percent Initiative Eligibility

To be eligible for the 5 Percent Initiative, activities must:

- Be difficult to evaluate against traditional program cost-effectiveness criteria.
- Comply with all applicable HMGP eligibility criteria as well as with federal, state, and local laws and ordinances.
- Be consistent with the goals and objectives of the relevant state, tribal or territorial (standard or enhanced) mitigation plans and local mitigation plans.
- Be submitted for review with a narrative that indicates that there is a reasonable expectation that future damage or loss of life or injury will be reduced or prevented by the activity.

Activities that may be eligible under the 5 Percent Initiative include:

- The use, evaluation and application of new, unproven mitigation techniques, technologies, methods, procedures or products.
- Purchase of equipment and systems for the purpose of warning residents of impending hazards.
- Purchase of secondary power sources or related equipment, such as generator hookups.
- Hazard identification or mapping and related equipment for the implementation of mitigation activities; however, mapping for the sole purpose of updating a Flood Insurance Rate Map remains ineligible.
- Acquisition of geographic information system software, hardware and data used for mitigation.
- Public awareness or education campaigns about mitigation.
- Evaluation of model building codes in support of future adoption and/or implementation.

A.8.1.2. HMGP: 5 Percent Initiative Closeout

The recipient will follow the closeout requirements for the mitigation activity that was funded under the 5 Percent Initiative. For public outreach, hazard identification and hazard mapping activities, the recipient should provide copies of the deliverables identified in the scope of work, including items such as printed materials, course videos and presentations.

A.8.2. HMGP: 5 PERCENT CODES AND STANDARDS

Applicants may apply for up to 5% of the HMGP ceiling amount for codes and standards activities. The 5 Percent Codes and Standards offers expanded eligibility for a variety of codes and standards activities. This funding source must be used for codes and standards activities and may be paired with the 5 Percent Initiative for a total of up to 10% of the HMGP ceiling amount.

A.9. HMGP: Management Costs

Management costs are indirect costs, direct administrative costs or other administrative expenses associated with a specific project or mitigation activity. The amounts, allowable uses, and procedures for HMGP management costs are established in Section 324 of the Stafford Act,[295] as

[295] 42 U.S.C. § 5165b

amended by Section 1215 of the Disaster Recovery Reform Act of 2018.[296] For more information on eligible management costs activities, refer to Part 13.

Management costs are provided outside of, and separate from, the HMGP ceiling amount. The total allowable management costs are up to 15%, of which up to 10% may be used by the recipient and up to 5% by the subrecipient. The subrecipient cannot request more than 5% of the total amount of the grant subaward. FEMA will obligate management cost assistance applied for by recipients and subrecipients in accordance with strategic funds management. There is no additional cost share requirement for HMGP management costs. For the recipient management cost calculation, the "total amount of the HMGP award" means the total amount of contributions based on applications submitted when the HMGP application period closes or when the total HMGP ceiling is determined, whichever is later. The total amount of the HMGP award includes the 75% federal share plus the required 25% non-federal share. In cases where the recipient submits subapplications totaling more than the HMGP ceiling, FEMA will only calculate management costs on subapplications up to the final HMGP ceiling amount. Figure 10 highlights how HMGP management costs are calculated.

The recipient and subrecipients will be reimbursed for actual management costs incurred. All assistance exceeding the incurred costs will be returned to FEMA.

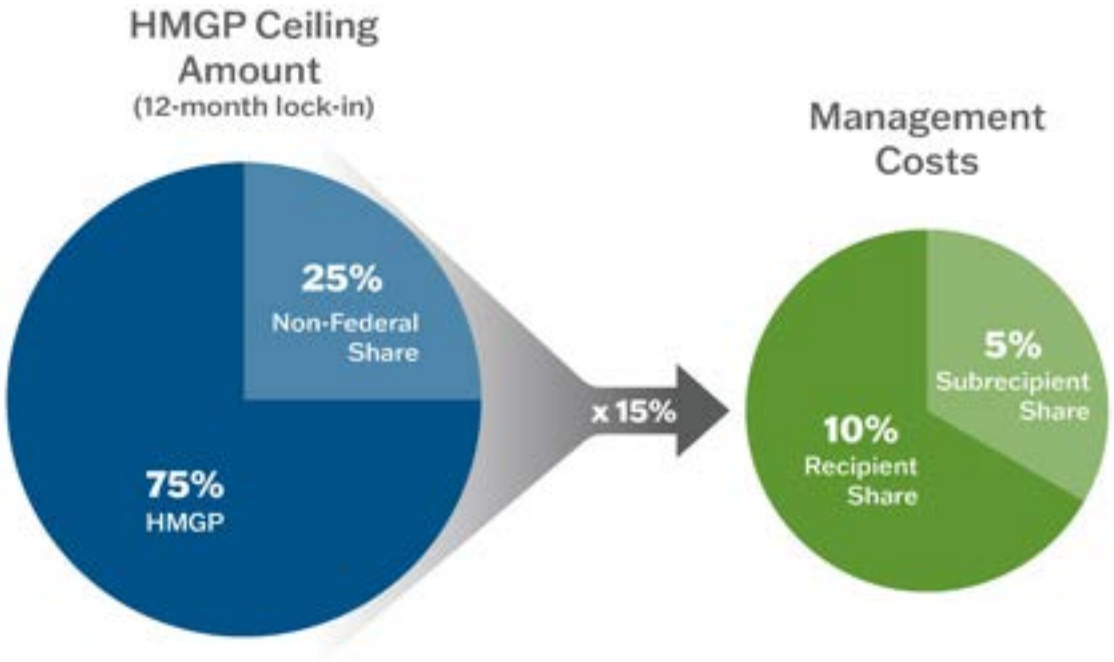

Figure 10. HMGP Management Costs Breakdown

[296] Public Law 115-254 (Oct. 5, 2018)

FEMA will establish the amount of assistance that it will initially make available for management costs based on point-in-time HMGP assistance projections. FEMA will provide preliminary management costs—the 30-day estimate—no sooner than 35 calendar days after the date of the major disaster declaration. This estimate is developed from the Disaster Projection Report and is based on the HMGP ceiling amount. FEMA will revise the estimated amount at six months. FEMA will determine the total management costs estimate 12 months after the date of the major disaster declaration or after determination of the total HMGP grant award, whichever is later.

Recipients cannot receive an additional 5% for management costs if also acting as a subrecipient. Management costs cannot be duplicated. However, other state and territorial agencies (other than the agency designated in the award agreement) who submit subapplications may apply for subrecipient management costs.

Additional information regarding specific management costs activities can be found in Part 13.

A.9.1. HMGP: 30-DAY ESTIMATE

Upon receipt of the initial 30-day management costs estimate, recipients with a FEMA-approved enhanced mitigation plan and who also have a Program Administration by States (PAS) designation may apply to FEMA for 35% of the estimated amount(s). Other recipients may apply to FEMA for 25% of the estimated amount(s).

A.9.2. HMGP: SIX-MONTH ESTIMATE

If the six-month management costs estimate increases beyond the 30-day estimate, and if the recipient can justify a need for additional management costs before the HMGP ceiling is established, the recipient may apply for available assistance. A recipient with an enhanced mitigation plan who also has a PAS designation may apply for 75% of the available or remaining recipient management costs. Other recipients may apply for 50% of the available or remaining recipient management costs.

A.9.3. HMGP: REQUESTING ADJUSTMENTS

Recipients may apply to FEMA for an adjustment in available assistance based on the 30-day or six-month estimates—that is, if they need management costs more than the 30-day (35/25%) and six-month (75/50%) percentage estimates. This option is intended for recipients that either do not have sufficient capacity because of lack of assistance, staffing or other necessary expertise to satisfy HMGP requirements or that have experienced significant disruption from a declared disaster or other event that impacts their ability to complete HMGP activities.

Recipients must apply to FEMA for an adjustment, provide justification that they need an exception, and complete one of the following:

- Provide a management plan that outlines how they will build state or tribal workforce proficiency and experience in grants management, mitigation planning or application review. This option is only available to recipients for whom FEMA has determined the degree of risk

in making a federal award to and requires that special conditions be attached to the award according to 2 CFR § 200.206.

- Enter into a PAS agreement if they meet program requirements.

A.9.4. HMGP: 12-MONTH ADJUSTMENT

The recipient is eligible to apply for the total management costs award subject to certain withholdings 12 months after the major disaster declaration.

FEMA will provide management costs for subrecipients (through the recipient) upon the agency's approval of each subaward, up to 5% of each project cost. Subrecipients must meet application and submission requirements.

A.9.5. HMGP: CLOSE OF APPLICATION PERIOD

If the recipient does not fully apply for the HMGP ceiling, FEMA must adjust the amount of available or obligated management costs based on the total amount of subapplications submitted by the end of the application period. If the HMGP ceiling is adjusted after the application period has closed, FEMA may provide additional management costs based on budget amendments applied to existing subapplications.

Regardless of when subawards are obligated, if the total amount of the award is adjusted for any reason, FEMA will de-obligate management costs that exceed the 15% cap (10% for recipient and 5% for subrecipient) based on updated calculations at the end of the application period or if the HMGP ceiling is adjusted, whichever is later.

A.10. HMGP: Application Period

The applicant must submit all HMGP subapplications (including recipient and subrecipient management costs requests) to FEMA within 12 months of the date of the major disaster declaration. Upon written request and justification from the recipient, FEMA may extend the application submission timeline in 30- to 90-day increments not to exceed a total extension of 180 calendar days, for a total possible application period of 18 months, in the event of extraordinary conditions.[297]

FEMA may extend the application period beyond 180 calendar days based on meeting the criteria of Section 301 of the Stafford Act,[298] which provides relief for the rare and extraordinary circumstance when the magnitude of the event for which the extension is requested prevents the recipient from meeting program administrative requirements. These requests will be considered on a case-by-case basis.

[297] 44 CFR § 206.436
[298] 42 U.S.C. § 5141

Extension requests must be submitted while the application period is still open. All extension requests submitted by the recipient must:

- Demonstrate that the recipient has made substantial progress in implementing the mitigation strategy and has submitted complete, eligible applications for a significant portion of HMGP assistance. FEMA will not accept incomplete or placeholder applications.
- Include a detailed narrative justification for the extension request that must:
  - Describe how the disaster created the conditions that prevented the recipient from meeting the application period deadline.
  - Document how HMGP was implemented consistent with the Administrative Plan including successes, challenges and failures.
  - Provide an implementation strategy and goals to use the remaining assistance including a reasonable assessment of the additional time requested and an updated Administrative Plan.
  - Identify any technical assistance that can assist in addressing resource gaps and/or is needed by the recipient to successfully implement the program.
- Provide a schedule of 30-day milestones and the associated goals for successful application submission up to the HMGP ceiling. FEMA will require the recipient to provide monthly updates to measure progress in implementing HMGP.
- Explain why any program support resources, including project scoping/advance assistance, technical assistance or training that FEMA provided during the application period were insufficient to successfully meet the application deadline.

If the HMGP ceiling amount is recalculated after the application period has closed, FEMA cannot reopen the application period. If the application period is open, the recipient can submit a request to extend the application period in accordance with Part 6. The recipient must submit the request to the FEMA associate administrator through the regional administrator or, if there is a joint field office, through the federal coordinating officer. The regional administrator or federal coordinating officer will provide their comments or concurrence and forward the request. To be considered, the applicant's inability to meet the HMGP application period deadline must have resulted from the event leading to the major disaster declaration.

FEMA will not accept lack of capacity as a valid justification for an extension if the recipient has not requested program support. For example, recipients must report problems, delays or adverse conditions that weaken their ability to meet the timeline for the request for extension to be justified. In addition, recipients must make efforts to address problems, delays or adverse conditions to have adequate justification for FEMA to approve a request.

A.11. HMGP: Cost Share and Global Match

HMGP awards are required to have at least a 25% non-federal cost share (excluding management costs). The recipient may choose to meet the cost share requirement by ensuring a minimum 25% non-federal share for the overall HMGP award rather than on an individual subaward basis. This strategy is referred to as global match.

Global match allows flexibility in which the non-federal cost share does not need to be 25% for each individual subaward. Instead, under the global match, the non-federal cost share for all the recipient's submitted subawards combined must equal 25% for the overall disaster. Global match allows the recipient to use any cost share match that exceeds the minimum requirement (referred to as overmatch) from certain subawards to alleviate the financial burden on other activities.

Recipients choosing this option must develop a cost share strategy as part of their Administrative Plan for FEMA review and approval.

The Administrative Plan must include a cost share strategy that explains how the applicant will:

- Apply this approach fairly and impartially to all subapplicants.
- Monitor the cost share for the overall award throughout the period of performance.
- Address any cost share shortfalls that may occur during the period of performance and at closeout.

If the non-federal cost share of the award is less than 25% of the total amount at closeout, FEMA will recoup the amount of federal assistance needed to bring the cost share into compliance.

Insular areas including American Samoa, Guam, the Northern Mariana Islands and the U.S. Virgin Islands may have a portion of their cost share waived if program requirements allow.[299] For more information, please refer to Part 4.L.

A.12. HMGP: Disaster Spend Plan

The HMGP Disaster Spend Plan (Spend Plan) is a forecasting tool that FEMA uses to evaluate the assistance needs of HMGP during a disaster. FEMA manages the timing of HMGP project awards and ensures assistance is available for obligation of approved activities.

It is critical that the recipient is an active participant in the Spend Plan. The recipient identifies assistance priorities for activities, forecasts assistance needs for future months and revises projections each month in coordination with FEMA. This process induces a more collaborative working relationship between FEMA and the recipient.

[299] 48 U.S.C. § 1469a

A.13. HMGP: Quarterly Progress Reports

FEMA distributes spreadsheets to recipients each quarter. The spreadsheets are prepopulated with information pulled from the electronic application system to indicate the open, obligated activities that require Quarterly Progress Reports. The recipient coordinates with their subrecipients to collect project information to update the fields in the spreadsheet. The recipient then returns the Quarterly Progress Reports to their FEMA region by the due date.

The recipient shall submit a Quarterly Progress Report for each award no more than 30 calendar days after the quarter end date. Table 11 describes the Quarterly Progress Report due dates.

Table 11: HMGP Quarterly Progress Report Timing

Quarter	Quarter Dates	Report Due Dates
1	Oct. 1 – Dec. 31	Jan. 30
2	Jan. 1 – March 31	April 30
3	April 1 – June 30	July 30
4	July 1 – Sept. 30	Oct. 30

Progress reports should include:

- Reporting period, including fiscal year and quarter.
- Project identification information, including disaster number, FEMA application identification, project number, subrecipient name and project title.
- Significant activities and developments that have occurred or have shown progress during the quarter, including a comparison of actual accomplishments to the work schedule objectives established in the subaward.
- Percent completion and whether completion of work is on schedule; a discussion of any problems, delays or adverse conditions that will impair the ability to meet the timelines stated in the subaward; and anticipated completion date.
- For phased projects, if Phase I of a Phase II project is complete, the percent complete noted as a percentage of the entire project (e.g., 50% or whatever is deemed appropriate by the recipient), not 100%.
    - If Phase II is not eligible and will therefore not move forward, the project is considered 100% complete. However, if Phase II is eligible/obligated, the Quarterly Progress Report should reflect 100% only once the approved scope of work is completed under Phase II.

- Status of costs, including whether the costs are unchanged, overrun or underrun. If there is a change in cost status, the report should include a description of the change in the comment column. The amount disbursed to the subrecipient by project should also be included. If there is a change in cost status, the report should include a description of the change in the comment column. The amount disbursed to the subrecipient by project should also be included.
- A statement of whether a request to extend the award period of performance is anticipated, provided in the comment column.
- The total recipient drawdown amount and most recent drawdown date, the total amount of federal assistance disbursed, the subrecipient expenditure to date and the date of final payment to subrecipient.
- The total number of properties acquired and their corresponding property identification numbers (for acquisition projects).
- Additional information as required by FEMA to assess the progress of an award.

FEMA may suspend drawdowns from federal financial systems (e.g., Payment Management System [SMARTLINK] or Payment and Reporting System [PARS]) if Quarterly Progress Reports are not submitted on time.

A.14. HMGP: Appeal Process

An eligible applicant, subapplicant, recipient or subrecipient may appeal any FEMA determination regarding applications or subapplications submitted for assistance under HMGP.[300] The subjects of these appeals include but are not limited to FEMA's denial of an applicant/subapplicant eligibility, mitigation plan requirements, application period extensions, EHP considerations, project or plan eligibility, technical feasibility, cost-effectiveness, open space compatibility and closeout determinations and de-obligations. Applicants, subapplicants, recipients or subrecipients may also appeal the placement of conditions on the award and any remedy of non-compliance that FEMA may take, including termination or suspension of the award.

FEMA will only consider written appeals that justify the request for reconsideration.[301] The appeal must be submitted according to the procedures outlined below. At any point in the appeal process, the recipient may withdraw their appeal by submitting a written request to FEMA and notifying the subapplicant/subrecipient. All second appeal decisions represent FEMA's final administrative decision.[302]

[300] 44 CFR § 206.440
[301] 44 CFR § 206.440(a)
[302] 44 CFR § 206.440(e)(3)

A.14.1. HMGP: CONTENT FOR FIRST AND SECOND APPEALS

The applicant/recipient and/or subapplicant/subrecipient must include the following in an appeal request:

- All relevant documentation supporting their position. Such documentation may include scope of work, budgets, EHP review, technical testimony, purchase receipts, before and/or after photographs and changes to the application or other relevant information that may help FEMA make a final decision.
- The specific amount of assistance (or amounts if there are multiple issues on appeal) in dispute, as applicable.
- Citations to the provisions of law, regulation or policy (applicable to the respective disaster) with which the applicant believes FEMA's determination was inconsistent.
- Recipient's recommendation, based on their review of the appeal from the subapplicant/subrecipient.

A.14.2. HMGP: APPEAL DEADLINE

An appellant is the applicant, subapplicant, recipient or subrecipient that is appealing a FEMA determination. Appellants must submit documentation within 60 calendar days after receiving the initial written notice of FEMA's determination on the action that is being appealed.[303]

Whether the appeal originated with the applicant/recipient or with a subapplicant/subrecipient, the appeal must be submitted in writing to the FEMA regional administrator by the recipient. The recipient must forward all appeals from a subapplicant/subrecipient with a written recommendation to the regional administrator within 60 calendar days of receipt of the appeal.[304]

If either the applicant or recipient submits the appeal after the 60-day deadline, FEMA will deny the appeal as untimely.

A.14.3. HMGP: APPEAL REVIEW

Upon receipt of the appeal, FEMA reviews the appeal content and uses the administrative record and the laws, regulations and policies applicable to each case to analyze the appeal. FEMA may request additional information via a Request for Information (RFI) to adequately adjudicate the appeal or make its decision based on the documentation and information provided at the time of appeal submission. Within 90 calendar days of receiving the appeal, FEMA takes one of the following actions:[305]

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[303] 44 CFR § 206.440(c)
[304] 44 CFR § 206.440(c)(2)
[305] 44 CFR § 200.440(c)(3)

- Requests additional information specifying the date FEMA must receive information. Within 90 calendar days of receiving the information (or within 90 calendar days of the expiration of the deadline to respond), FEMA provides the appeal decision to the recipient.

- Submits the appeal to an independent expert or experts for technical review and recommendations. Within 90 calendar days of receiving the technical review recommendations, FEMA provides its appeal decision to the recipient.[306]

In either case, FEMA provides a written decision to the recipient using a method that confirms receipt (through electronic application systems, return receipt mail, email with read-receipt acknowledgement or other methods that confirm receipt).

A.14.4. HMGP: REQUEST FOR INFORMATION FOR APPEALS

If FEMA needs additional information, the agency will determine a date by which the information must be provided. Within 90 calendar days following the receipt of the requested additional information (or 90 calendar days after the information was due), FEMA will notify the recipient in writing of the disposition of the appeal.

FEMA generally issues a RFI when it identifies specific documentation or information that, if provided, might impact the outcome of the appeal or assist the agency in responding adequately to the appeal.

A.14.5. HMGP: FIRST APPEAL PROCESS

The FEMA regional administrator is the decision-maker on first appeals.[307] Within 90 calendar days following the receipt of an appeal, FEMA will notify the recipient in writing of either the appeal decision or the need for additional information.

A.14.6. HMGP: SECOND APPEAL PROCESS

The second appeal provides an opportunity for appellants to dispute the appeal decision made by the regional administrator. The assistant administrator for the Mitigation Directorate is the decision-maker on second appeals.[308] The assistant administrator's decision will be the final administrative decision of FEMA.[309] Figure 11 outlines the second appeal process for HMGP.

[306] 44 CFR § 206.440(d)
[307] 44 CFR § 206.440(b)
[308] 44 CFR § 206.440(b)(2)
[309] 44 CFR § 206.440(e)(3)

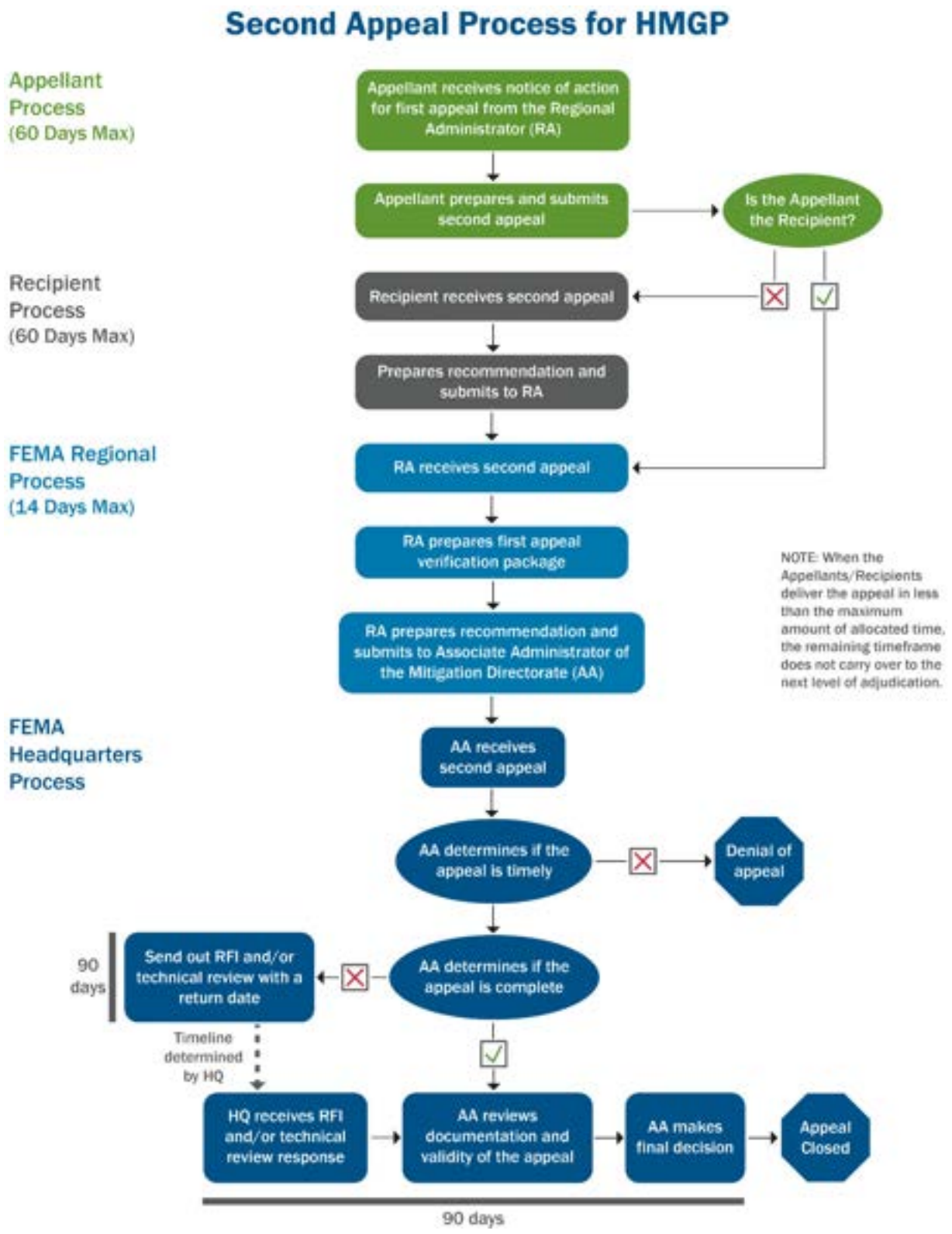

Figure 11. HMGP Second Appeal Process Flowchart

A.14.6.1. HMGP: Second Appeal Actions – Appellant

To begin the second appeal process, appellants must submit documentation to FEMA within 60 calendar days after receiving the initial notice of the action on the first appeal. When the appellant is the subapplicant/subrecipient, the appeal must be submitted to the recipient prior to the expiration of the 60-day period.

A.14.6.2. HMGP: Second Appeal Actions – Recipient

The recipient reviews the appeal and prepares a recommendation to submit to the FEMA regional administrator. The appeal and supporting documentation must be forwarded to the regional administrator within 60 calendar days of receipt of the second appeal. When the appellant is the recipient, no recommendation is needed because the appeal acts as its disposition. Otherwise, the recipient acts as the reviewer.

A.14.6.3. HMGP: Second Appeal Actions – Region

Upon receipt of the appeal package from the recipient, the FEMA regional administrator will review the package for regulatory requirements. Once completed, the regional administrator will forward the appeal, along with a recommendation, to the associate administrator for the Mitigation Directorate.

An appeal verification package confirms that the appellant is eligible for a second appeal. As part of the verification package, the region should prepare the following items to submit to FEMA headquarters:

- A decision letter that documents the initial action taken by the region or recovery office regarding the HMGP application or subapplication precedes the first appeal and usually outlines the basis for denial.
- The set of first appeal documents submitted by the appellant opposing the decision letter.
- The recipient recommendation for first appeal, which documents the recipient's position on the first appeal (if applicable).
- A notice of the action that documents the first appeal decision of the FEMA regional administrator, which is typically the action disputed in the second appeal.
- The set of second appeal documents submitted by the appellant opposing the notice of the action (first appeal decision).
- An appeal recommendation from the regional administrator and/or recovery office that documents the region's preliminary review of the second appeal. If the appellant submits supplemental information, the region should note these changes. No matter which office (region or recovery office) provides the second appeal, the recommendation must accompany the appeal submission to FEMA headquarters.

A.14.6.4. HMGP: Second Appeal Actions – FEMA Headquarters

Upon receipt from the region, FEMA headquarters will make an independent assessment of the appeal. If all documentation is included, the assistant administrator for the Mitigation Directorate notifies the recipient in writing of the disposition of the appeal within 90 calendar days. If additional information is needed, regardless of an internal or external request, FEMA headquarters determines a date by which the RFI must be returned. In cases when the appeal requires a highly technical analysis, FEMA headquarters will consult an independent scientific or technical expert on the subject. Once FEMA headquarters has completed the RFI and technical review processes, FEMA headquarters notifies the recipient in writing of the disposition within 90 calendar days. The assistant administrator for the Mitigation Directorate makes the final decision.[310] If the appeal deals with a mitigation planning subaward, the assistant administrator will coordinate with the National Mitigation Planning program.

A FEMA delay in issuing a decision beyond the applicable 90 or 180 calendar days does not compel the FEMA regional administrator or associate administrator to decide in the appellant's favor.

B. Hazard Mitigation Grant Program Post Fire

HMGP Post Fire assistance is available for areas that received a Fire Management Assistance Grant (FMAG) declaration, even if no major disaster declaration was made. Section 420 of the Stafford Act authorizes FEMA to provide assistance under its FMAG program for the mitigation, management and control of any fire that threatens such destruction as would constitute a major disaster.[311] Whether or not a major disaster is declared, the President may provide HMGP Post Fire assistance in accordance with Section 404 of the Stafford Act in any area affected by a fire for which assistance was provided under Section 420 of the Stafford Act.[312]

Throughout the HMA Guide, unless specified otherwise in this section, activity development, application, submission and grants management processes that apply to HMGP will also apply to HMGP Post Fire. In addition, all eligible activities under HMGP are also eligible under HMGP Post Fire.

B.1. HMGP Post Fire: Request for Assistance

Section 1204 of the Disaster Recovery Reform Act amended Section 404 of the Stafford Act to allow FEMA to provide HMGP Post Fire assistance for hazard mitigation measures that substantially reduce the risk of future damage, hardship, loss or suffering in any area affected by a fire for which assistance was provided under Section 420 of the Stafford Act. Therefore, unlike HMGP, the availability of HMGP Post Fire assistance is not contingent on a major disaster declaration and is

[310] 44 CFR § 206.440(e)(3)
[311] 42 U.S.C. § 5187
[312] 42 U.S.C. § 5170c

instead triggered by an FMAG declaration.[313] Eligible activities may be outside of the declared area if the risk reduction benefits include the declared county or counties (e.g., watershed mitigation). If funding cannot be used in the declared areas, it may be made available statewide.

States, certain federally recognized tribes and territories that have received an FMAG declaration are eligible to apply for assistance under HMGP Post Fire.

Federally recognized tribes have multiple options for applying for HMGP Post Fire. Under an FMAG declaration made to a state or territory, federally recognized tribes with burned land from the FMAG declared event may request an HMGP award as recipients. If a tribe chooses to be a recipient, the tribe must notify FEMA of its intent to apply within 60 days of the state's assistance notification as noted in Part 10.B.4. Tribes (including federally recognized tribes) may also apply through the state to FEMA as subapplicants. Subapplicants will follow the standard HMGP subapplicant procedures consistent with program guidance including updates in effect at the time of the FMAG declaration.

A signed FEMA-State Agreement or FEMA-Tribal Agreement is required to implement the HMGP Post Fire program following FMAG declarations.

B.2. HMGP Post Fire: Administrative Plan

The HMGP Post Fire Administrative Plan (Administrative Plan) is a procedural guide that details how the recipient will administer HMGP Post Fire awards and subawards. Recipients must have a current Administrative Plan approved by FEMA before receiving HMGP Post Fire assistance. The Administrative Plan may become an annex or chapter of the state's or tribe's overall emergency response and operations plan or comprehensive mitigation program strategy.

At a minimum, the Administrative Plan must:

- Designate the agency that will act as recipient.
- Identify the applicant's hazard mitigation officer or designated representative.
- Identify staffing requirements and resources, including a procedure for expanding staff temporarily following a disaster, if necessary.
- Establish procedures to guide implementation activities, including recipient management costs and distribution of subrecipient management costs.
- Establish procedures for monitoring and reporting on subrecipient management costs.
- Comply with any other requirements outlined in 44 CFR § 206.437.

[313] 44 CFR § 204.21

Recipients must complete the HMGP Administrative Plan Checklist as part of the review of the plan.

B.2.1. HMGP POST FIRE: ADMINISTRATIVE PLAN DESIGNATION OF RECIPIENT AND HAZARD MITIGATION OFFICER

Typically, the agency designated to act as the recipient (i.e., state, tribe or territory) manages the responsibilities for federal and state/tribal/territorial disaster assistance and is responsible for meeting the mitigation planning requirement. Although a single agency may administer the assistance, the governor may establish an interagency mitigation team to manage the state/tribal/territorial mitigation program.

The recipient's hazard mitigation officer, or designated representative, is typically responsible for managing the recipient's mitigation program, coordinating the mitigation team and developing and implementing the hazard mitigation plan. The recipient's hazard mitigation officer must also make funds available for planning and provide assistance and training to local governments applying for funds and developing mitigation plans.[314] Recipients often rely on staff from the emergency management agency or other state or tribal agencies to be the hazard mitigation officer's staff following a disaster.

B.2.2. HMGP POST FIRE: ADMINISTRATIVE PLAN STAFFING REQUIREMENTS AND THE MITIGATION TEAM

The Administrative Plan must identify the positions and the minimum number of personnel needed to implement HMGP Post Fire. Key positions may include clerical, administrative and financial managers; grants managers; engineers and/or architects; and mitigation, community and environmental planners. These positions support mitigation planning and administration and the implementation of mitigation activities. However, the staff organizational structure should remain flexible as it may be augmented as needed with emergency management agency staff, staff from other agencies or temporary staff or contractors hired to administer HMGP Post Fire effectively. The hazard mitigation officer should build capacity and resilience by using both community and mitigation planners. The Administrative Plan should include a procedure for expanding staff resources and using HMGP Post Fire management costs.

The mitigation team may include representatives of agencies involved with emergency management, natural resources, floodplain management, environmental issues, historic preservation and archaeology, soil conservation, transportation, planning and zoning, housing and economic development, building regulations, infrastructure regulations or construction, public information, insurance, regional and local government, academia, businesses and nonprofit organizations. With the varied backgrounds and specialized expertise of members, the team creates interagency, interdisciplinary insight regarding risks and potential solutions. The interagency aspect of the team can diffuse political pressure on the recipient agency and increase the availability of resources.

[314] 44 CFR § 201.3

The mitigation team may support the recipient agency by:

- Developing a comprehensive mitigation implementation strategy based on the FEMA-approved mitigation plan.
- Supporting development and implementation of state, local, tribal and territorial mitigation plans.
- Communicating with local governments regarding mitigation priorities found in mitigation plans and updates based on the disaster activity.
- Coordinating with community planning and capacity-building, recovery planning, HMGP and Public Assistance mitigation.
- Building public and business/industry support for mitigation initiatives.
- Reviewing, assigning priority and recommending mitigation actions for implementation.
- Seeking assistance for implementation of mitigation measures using a wide range of public and private resources in accordance with the National Mitigation Investment Strategy.

B.2.3. HMGP POST FIRE: ADMINISTRATIVE PLAN PROCEDURES TO GUIDE IMPLEMENTATION ACTIVITIES

The Administrative Plan must establish procedures to:

- Identify and notify potential subapplicants of the availability of HMGP Post Fire assistance.
- Provide potential subapplicants with information on the application process, management costs, program eligibility and deadlines.
- Determine subapplicant eligibility.
- Provide information, training and technical assistance on mitigation planning requirements.
- Provide information for environmental and historic preservation (EHP) and floodplain management reviews in conformance with FEMA Directive 108-1, *Environmental Planning and Historic Preservation Responsibilities and Program Requirements* (Oct. 10, 2018).
- Process requests for advances of assistance and reimbursements.
- Monitor and evaluate the progress and completion of mitigation activities.
- Monitor subrecipient management costs.
- Review and approve cost overruns.

- Process appeals.
- Provide technical assistance as required to subrecipients.
- Comply with the administrative requirements of 44 CFR § 206.437 and 2 CFR Part 200.
- Comply with audit requirements of 2 CFR Part 200, Subpart F.
- Provide Quarterly Progress Reports to FEMA on mitigation activities.

B.2.4. HMGP POST FIRE: ADMINISTRATIVE PLAN SUBMISSION AND APPROVAL DEADLINE

A recipient may forward a new or updated Administrative Plan to FEMA for approval at any time. A recipient should review and update their plan annually and must review and update the plan following a major disaster declaration if required to meet current policy guidance or changes to the administration of the program. If a review indicates there will be no changes to the current Administrative Plan, the recipient should notify FEMA within 90 calendar days of the major disaster declaration.

B.3. HMGP Post Fire: Eligibility

The following sections highlight eligibility for HMGP Post Fire. All eligibility requirements in Part 4 must also be met. Additional information also can be found on the FEMA "Hazard Mitigation Grant Program" webpage.

B.3.1. HMGP POST FIRE: ELIGIBLE APPLICANTS AND SUBAPPLICANTS

States and territories that have received an FMAG declaration are eligible to apply for assistance under HMGP Post Fire. Federally recognized tribes with burned land under a state or territory FMAG declared event may apply for HMGP Post Fire as an applicant/recipient.

Tribes (including federally recognized tribes) may apply through the state to FEMA as subapplicants and will follow the standard HMGP subapplicant procedures consistent with program guidance, including updates in effect at the time of the FMAG declaration.

As described in Part 4, private nonprofit organizations may act as the subapplicant for HMGP Post Fire if they own or operate a private nonprofit facility.[315]

B.3.2. HMGP POST FIRE: PLAN REQUIREMENTS

States, territories, and/or federally recognized tribes applying for HMGP Post Fire must have a FEMA-approved mitigation plan at the time of the FMAG declaration and at the time HMGP Post Fire assistance is obligated. Subapplicants applying for HMGP Post Fire assistance must have an-

[315] 44 CFR § 206.434(a)(2)

approved mitigation plan when assistance is obligated. For more information about mitigation plan requirements, refer to Part 4.C.

B.3.3. HMGP POST FIRE: ELIGIBLE ACTIVITIES

Activities that can be accomplished under HMGP Post Fire are generally the same as those under HMGP and BRIC. HMGP Post Fire prioritizes wildfire and post-wildfire mitigation activities, to include defensible space measures, ignition-resistant building materials, hazardous fuels reduction activities, erosion control measures, slope stabilization and post-wildfire flood reduction measures authorized under Section 404(f) of the Stafford Act.[316] As in other HMA programs, these activities are required to be cost-effective.

Recipients will prioritize HMGP Post Fire activities in the following manner:

1. Activities that benefit the declared county, counties or burned tribal lands with wildfire hazard mitigation projects such as defensible space measures, ignition-resistant construction, hazardous fuels reduction, erosion control measures, slope stabilization or post-wildfire flood reduction measures.
2. Activities unrelated to wildfire hazard mitigation, such as generally allowable HMGP projects within the declared county, counties or burned tribal lands.
3. Activities related to wildfire hazard mitigation, such as generally allowable HMGP projects, outside of the declared county, counties or burned tribal lands.
4. Activities unrelated to wildfire hazard mitigation, such as generally allowable HMGP projects outside of the declared county, counties or burned tribal lands.

For state or tribal applications for activities outside of the declared or burned area(s), the recipient or subrecipient must explain in the subapplication why the assistance will not be used in the declared or burned area(s).

B.4. HMGP Post Fire: Available Assistance

FEMA will calculate the amount of assistance available under HMGP Post Fire based on the 10-year national average of assistance provided under FMAG declarations for the states. FEMA will provide two separate calculations: one for recipients that have mitigation plans and a higher calculation for recipients that have enhanced mitigation plans.

FEMA will recalculate the national average and the amount of assistance available at the beginning of each fiscal year. The revised amount will be available for declarations for that fiscal year, Oct. 1 to Sept. 30.

[316] 42 U.S.C. § 5170c

FEMA will aggregate assistance from multiple events into one award per recipient under the first declaration for that fiscal year unless the recipient informs FEMA of reasons for not aggregating. Aggregation will reset at the beginning of each fiscal year and remain in effect for that year.

B.5. HMGP Post Fire: Apportionment

Federally recognized tribes with burned land because of a declared FMAG may apply to FEMA as HMGP Post Fire applicants. The tribe must notify FEMA of its intent to apply within 60 calendar days of the state's assistance notification. If FEMA approves assistance for both the state/territory and the tribe, it will apportion the amount of assistance between the state or territory and the tribal government. The apportionment will be calculated based on the amount of each recipient's burned acreage as a percentage of the allotment to which they are entitled under the calculation described above. FEMA regional administrators will have final authority on apportionment determinations.

B.6. HMGP Post Fire: Timing of Obligation of Assistance

HMGP Post Fire funds may be obligated for subawards submitted during the open application period and, in limited circumstances, when the application period is closed and the period of performance is open for cost overruns, budget changes, some project modifications or schedule changes. HMGP Post Fire funds must not, however, be obligated to fund new projects or scope expansions of the original projects that may result in a new project. HMGP Post Fire funds cannot be obligated for mitigation activities after the application period and the period of performance have closed (i.e., during closeout and after closeout of the award).

B.7. HMGP Post Fire: Assistance Restrictions

Assistance restrictions are caps or restrictions on the amount of assistance that applicants may use for specific activities under the HMGP Post Fire award. For HMGP Post Fire, the restrictions include the following:

- **Advance assistance**: Advance assistance is authorized by Section 404(e) of the Stafford Act,[317] which allows advancing up to 25% of the available assistance or $10 million, whichever is less. For more detail, refer to Part 11.B.
- **5 Percent Initiative**: Up to 5% of the recipient's available assistance may be used for mitigation measures that are difficult to evaluate against traditional program cost-effectiveness. For more detail, refer to Part 10.B.7.1.

[317] Advance Assistance was added by Section 1104 of the Sandy Recovery Improvement Act of 2013, Public Law 113-2 (Jan. 29, 2013).

- **7 Percent planning**: Up to 7% of the recipient's available assistance may be used for mitigation planning activities in compliance with 44 CFR § 201.3(c)(4). For more detail, refer to Part 11.A.3.3.1.
- **5 Percent Codes and Standards**: Up to 5% of the recipient's available assistance may be used for codes and standards mitigation activities. For more detail, refer to Part 11.E.2.4.1.

Figure 12 highlights how HMGP Post Fire is broken down.

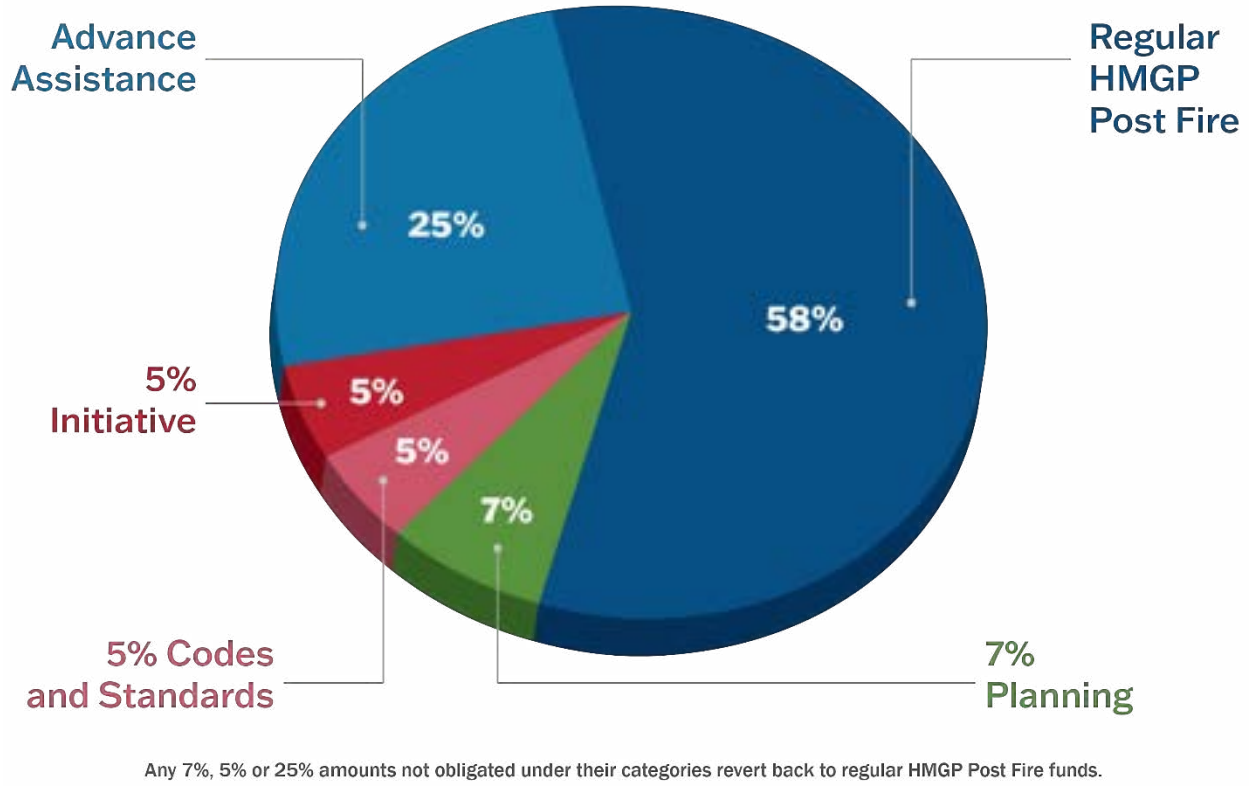

Figure 12. HMGP Post Fire Funding Breakdown

B.7.1. HMGP POST FIRE: THE 5 PERCENT INITIATIVE

Some mitigation activities are difficult to evaluate using FEMA-approved cost-effectiveness methodologies. Up to 5% of the recipient's HMGP Post Fire available assistance amount may be set aside by the recipient to pay for such activities. The 5 Percent Initiative funds cannot be used in situations where mitigation activities can be evaluated under FEMA-approved cost-effectiveness methods but do not meet the required Benefit-Cost Ratio.

B.7.1.1. HMGP Post Fire: 5 Percent Initiative Eligibility

To be eligible for the 5 Percent Initiative, activities must:

- Be difficult to evaluate against traditional program cost-effectiveness criteria.

- Comply with all applicable HMGP Post Fire eligibility criteria as well as with federal, state and local laws and ordinances.
- Be consistent with the goals and objectives of the relevant state, tribal or territorial (standard or enhanced) mitigation plans and local mitigation plans.
- Be submitted for review with a narrative that indicates there is a reasonable expectation that future damage or loss of life or injury will be reduced or prevented by the activity.

Activities that might be eligible under the 5 Percent Initiative include:

- The use, evaluation and application of new, unproven mitigation techniques, technologies, methods, procedures or products.
- Purchase of equipment and systems for the purpose of warning residents of impending hazards.
- Purchase of secondary power sources or related equipment, such as generator hookups.
- Hazard identification or mapping and related equipment for the implementation of mitigation activities; however, mapping for the sole purpose of updating a Flood Insurance Rate Map remains ineligible.
- Acquisition of geographic information system software, hardware and data used for mitigation.
- Public awareness or education campaigns about mitigation.
- Evaluation of model building codes in support of future adoption and/or implementation.

B.7.1.2. HMGP Post Fire: 5 Percent Initiative Closeout

The recipient will follow the closeout requirements for the mitigation activity that was funded under the 5 Percent Initiative. For public outreach, hazard identification and hazard mapping activities, the recipient should provide copies of the deliverables identified in the scope of work, including items such as printed materials, course videos and presentations.

B.7.2. HMGP POST FIRE: 5 PERCENT CODES AND STANDARDS

Applicants may apply for up to 5% of the HMGP Post Fire available assistance amount for codes and standards activities. The 5 Percent Codes and Standards offers expanded eligibility for a variety of codes and standards activities. This funding source must be used for codes and standards activities and may be paired with the 5 Percent Initiative for a total of up to 10% of the HMGP Post Fire available assistance amount.

B.8. HMGP Post Fire: Management Costs

Management costs are indirect costs, direct administrative costs or other administrative expenses associated with a specific project or mitigation activity. The amounts, allowable uses, and procedures for HMGP Post Fire management costs are established in Section 324 of the Stafford Act,[318] as amended by Section 1215 of the Disaster Recovery Reform Act.[319] For more information on indirect costs, refer to Part 13.

Management costs are provided outside of, and separate from, the HMGP Post Fire available assistance amount. The total allowable management costs are up to 15%, of which up to 10% may be used by the recipient and up to 5% by the subrecipient. The subrecipient cannot request more than 5% of the total amount of the grant subaward. FEMA will obligate management cost assistance applied for by recipients and subrecipients in accordance with strategic funds management. There is no additional cost share requirement for HMGP Post Fire management costs.

For the recipient management cost calculation, the "total amount of the HMGP Post Fire award" means the total amount of contributions based on applications submitted when the HMGP Post Fire application period closes or when the total HMGP Post Fire available assistance amount is determined, whichever is later. The total amount of the HMGP Post Fire award includes the 75% federal share plus the required 25% non-federal share. In cases where the recipient submits subapplications totaling more than the HMGP Post Fire available assistance amount, FEMA will only calculate management costs on subapplications up to the final HMGP Post Fire available assistance amount. Figure 13 highlights how HMGP Post Fire management costs are calculated.

[318] 42 U.S.C. § 5165b
[319] Public Law 115-254 (Oct. 5, 2018)

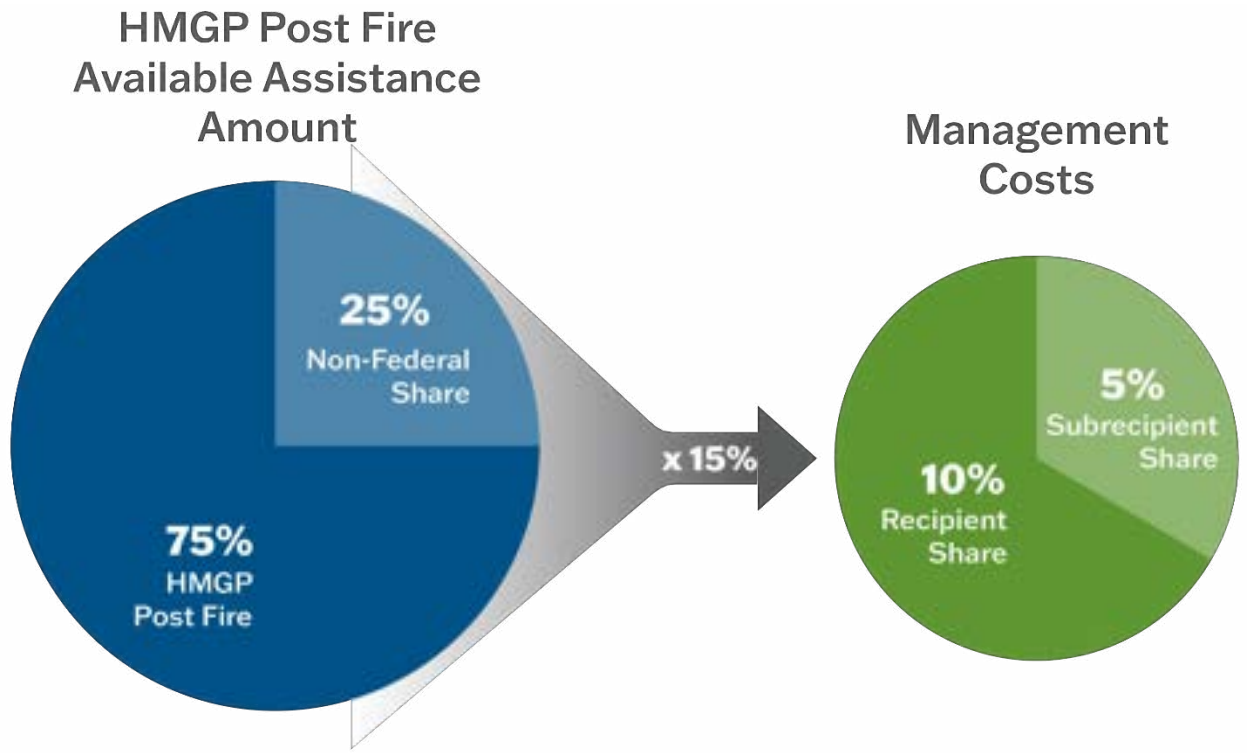

Figure 13. HMGP Post Fire Management Costs Breakdown

FEMA will provide management costs under HMGP Post Fire in accordance with HMGP management costs outlined in Part 10.A.9, except that FEMA will not provide multiple estimates of the amount of management costs available. Instead, it will provide one estimate of the management costs available under HMGP Post Fire for the first fire for which assistance was provided under Section 420 of the Stafford Act, which will be included in the formal funding notification. The estimate will subsequently be increased as appropriate for each FMAG event that is aggregated.

The recipient and subrecipients will be reimbursed for actual management costs incurred. All assistance exceeding the incurred costs will be returned to FEMA.

Recipients cannot receive an additional 5% for management costs if also acting as a subrecipient. Management costs cannot be duplicated. However, other state and territorial agencies (other than the agency designated in the award agreement) who submit subapplications may apply for subrecipient management costs. Additional information regarding specific management costs activities can be found in Part 13.

If the recipient does not apply for the full HMGP Post Fire available assistance amount, FEMA must adjust the amount of available or obligated management costs based on the total amount of subapplications submitted by the end of the application period. If the HMGP Post Fire available assistance amount is adjusted after the application period has closed, FEMA may provide additional management costs based on budget amendments applied to existing subapplications.

Regardless of when subawards are obligated, if the total amount of the award is adjusted for any reason, FEMA will de-obligate management costs that exceed the 15% cap (10% for recipient and 5% for subrecipient) based on updated calculations at the end of the application period or if the HMGP Post Fire available assistance amount is adjusted, whichever is later.

B.9. HMGP Post Fire: Application Period

States, federally recognized tribes, and territories affected by fires resulting in an FMAG declaration are eligible to apply for HMGP Post Fire. The application period opens with the state or territory's first FMAG declaration of the fiscal year and closes six months after the end of that fiscal year.

The FEMA regional administrator may grant up to two 90-day extensions to the application period. Additional extensions must be requested from the region and approved by the deputy associate administrator for the Mitigation Directorate. FEMA will send a formal assistance notification letter to eligible applicants with the first and each subsequent FMAG declaration.

B.10. HMGP Post Fire: Cost Share and Global Match

HMGP Post Fire awards are required to have at least a 25% non-federal cost share. The recipient may choose to meet the cost share requirement by ensuring a minimum 25% non-federal share for the overall HMGP Post Fire award rather than on an individual activity basis. This strategy is referred to as global match.

Global match allows flexibility in which the non-federal cost share does not need to be 25% for each individual subaward. Instead, under the global match, the non-federal cost share for all the recipient's submitted subawards combined must equal 25% for the overall disaster. Global match allows the applicant to use any cost share match that exceeds the minimum requirement (referred to as overmatch) from certain subawards to alleviate the financial burden on other activities.

Recipients choosing this option must develop a cost share strategy as part of their Administrative Plan for FEMA review and approval.

The Administrative Plan must include a cost share strategy that explains how the applicant will:

- Apply this approach fairly and impartially to all subapplicants.
- Monitor the cost share for the overall award throughout the period of performance.
- Address any cost share shortfalls that may occur during the period of performance and at closeout.

If the non-federal cost share of the award is less than 25% of the total amount at closeout, FEMA will recoup the amount of federal assistance needed to bring the cost share into compliance.

Insular areas including American Samoa, Guam, the Northern Mariana Islands and the U.S. Virgin Islands may have a portion of their cost share waived if program requirements allow.[320]

B.11. HMGP Post Fire: Disaster Spend Plan

The HMGP Disaster Spend Plan (Spend Plan) is a forecasting tool that FEMA uses to evaluate the assistance needs of HMGP during a disaster. FEMA manages the timing of HMGP project awards and ensures that assistance is available for obligation of approved activities.

It is critical that the recipient is an active participant in the Spend Plan. The recipient identifies assistance priorities for activities, forecasts assistance needs for future months and revises projections each month in coordination with FEMA. This process induces a more collaborative working relationship between FEMA and the recipient.

B.12. HMGP Post Fire: Quarterly Progress Reports

FEMA distributes spreadsheets to recipients each quarter. The spreadsheets are prepopulated with information pulled from the electronic application system to indicate the open, obligated activities that require Quarterly Progress Reports. The recipient coordinates with their subrecipients to collect project information to update the fields in the spreadsheet. The recipient then returns the Quarterly Progress Reports to their FEMA region by the due date.

The recipient shall submit a Quarterly Progress Report for each award no more than 30 calendar days after the quarter end date. Table 12 describes the Quarterly Progress Report due dates.

Table 12: HMGP Post Fire Quarterly Progress Report Timing

Quarter	Quarter Dates	Report Due Dates
1	Oct. 1 – Dec. 31	Jan. 30
2	Jan. 1 – March 31	April 30
3	April 1 – June 30	July 30
4	July 1 – Sept. 30	Oct. 30

Progress reports should include:

- Reporting period, including fiscal year and quarter.
- Project identification information, including disaster number, FEMA application identification, project number, subrecipient name and project title.

[320] 48 U.S.C. § 1469a

- Significant activities and developments that have occurred or have shown progress during the quarter, including a comparison of actual accomplishments to the work schedule objectives established in the subaward.
- Percent completion and whether completion of work is on schedule; a discussion of any problems, delays or adverse conditions that will impair the ability to meet the timelines stated in the subaward; and anticipated completion date.
- For phased projects, if Phase I of a Phase II project is complete, the percent complete noted as a percentage of the entire project (e.g., 50% or whatever is deemed appropriate by the recipient), not 100%.
    - If Phase II is not eligible and will therefore not move forward, the project is considered 100% complete. However, if Phase II is eligible/obligated, the Quarterly Progress Report should reflect 100% only once the approved scope of work is completed under Phase II.
- Status of costs, including whether the costs are unchanged, overrun or underrun. If there is a change in cost status, the report should include a description of the change in the comment column. The amount disbursed to the subrecipient by project should also be included. If there is a change in cost status, the report should include a description of the change in the comment column. The amount disbursed to the subrecipient by project should also be included.
- A statement of whether a request to extend the award period of performance is anticipated, provided in the comment column.
- The total recipient drawdown amount and most recent drawdown date, the total amount of federal assistance disbursed, the subrecipient expenditure to date and the date of final payment to the subrecipient.
- The total number of properties acquired and their corresponding property identification numbers (for acquisition projects).
- Additional information as required by FEMA to assess the progress of an award.

FEMA may suspend drawdowns from SMARTLINK or PARS if Quarterly Progress Reports are not submitted on time.

B.13. HMGP Post Fire: Appeal Process

An eligible applicant, subapplicant, recipient or subrecipient may appeal any FEMA determination regarding applications or subapplications submitted for assistance under HMGP Post Fire.[321] The

[321] 44 CFR § 206.440

subjects of these appeals include but are not limited to FEMA's denial of an applicant/subapplicant eligibility, mitigation plan requirements, application period extensions, EHP considerations, project or plan eligibility, technical feasibility, cost-effectiveness, open space compatibility and closeout determinations and de-obligations. Applicants, subapplicants, recipients or subrecipients may also appeal the placement of conditions on the award and any remedy of non-compliance that FEMA may take, including termination or suspension of the award.

FEMA will only consider written appeals that justify the request for reconsideration.[322] The appeal must be submitted according to the procedures outlined below. At any point in the appeal process, the recipient may withdraw their appeal by submitting a written request to FEMA. and notifying the subapplicant/subrecipient. All second appeal decisions represent FEMA's final administrative decision.[323]

B.13.1. HMGP POST FIRE: CONTENT FOR FIRST AND SECOND APPEALS

The applicant/recipient and/or subapplicant/subrecipient must include the following in an appeal request:

- All relevant documentation supporting their position. Such documentation may include scope of work, budgets, EHP review, technical testimony, purchase receipts, before and/or after photographs and changes to the application or other relevant information that may help FEMA make a final decision.
- The specific amount of assistance (or amounts if there are multiple issues on appeal) in dispute, as applicable.
- Citations to the provisions of law, regulation or policy (applicable to the respective disaster) with which the applicant believes FEMA's determination was inconsistent.
- Recipient's recommendation, based on their review of the appeal from the subapplicant/subrecipient.

B.13.2. HMGP POST FIRE: APPEAL DEADLINE

An appellant is the applicant, subapplicant, recipient or subrecipient that is appealing a FEMA determination. Appellants must submit documentation within 60 calendar days after receiving the initial written notice of FEMA's determination on the action that is being appealed.[324]

Whether the appeal originated with the applicant/recipient or with a subapplicant/subrecipient, the appeal must be submitted in writing to the FEMA regional administrator by the recipient. The

[322] 44 CFR § 206.440(a)
[323] 44 CFR § 206.440(e)(3)
[324] 44 CFR § 206.440(c)

recipient must forward all appeals from a subapplicant/subrecipient with a written recommendation to the regional administrator within 60 calendar days of receipt of the appeal.[325]

If either the applicant or recipient submits the appeal after the 60-day deadline, FEMA will deny the appeal as untimely.

B.13.3. HMGP POST FIRE: APPEAL REVIEW

Upon receipt of the appeal, FEMA reviews the appeal content and uses the administrative record and the laws, regulations and policies applicable to each case to analyze the appeal. FEMA may request additional information via a Request for Information (RFI) to adequately adjudicate the appeal or make its decision based on the documentation and information provided at the time of appeal submission. Within 90 calendar days of receiving the appeal, FEMA takes one of the following actions:[326]

- Requests additional information specifying the date FEMA must receive information. Within 90 calendar days of receiving the information (or within 90 calendar days of the expiration of the deadline to respond), FEMA provides the appeal decision to the recipient.
- Submits the appeal to an independent expert or experts for technical review and recommendations. Within 90 calendar days of receiving the technical review recommendations, FEMA provides its appeal decision to the recipient.[327]

In either case, FEMA provides a written decision to the recipient using a method that confirms receipt (through electronic application systems, return receipt mail, email with read-receipt acknowledgement or other methods that confirm receipt).

B.13.4. HMGP POST FIRE: REQUEST FOR INFORMATION FOR APPEALS

If FEMA needs additional information, the agency will determine a date by which the information must be provided. Within 90 calendar days following the receipt of the requested additional information (or 90 calendar days after the information was due), FEMA will notify the recipient in writing of the disposition of the appeal.

FEMA generally issues a RFI when it identifies specific documentation or information that, if provided, might impact the outcome of the appeal or assist the agency in responding adequately to the appeal.

[325] 44 CFR § 206.440(c)(2)
[326] 44 CFR § 200.440(c)(3)
[327] 44 CFR § 206.440(d)

B.13.5. HMGP POST FIRE: FIRST APPEAL PROCESS

The FEMA regional administrator is the decision-maker on first appeals.[328] Within 90 calendar days following the receipt of an appeal, FEMA will notify the recipient in writing of either the appeal decision or the need for additional information.

B.13.6. HMGP POST FIRE: SECOND APPEAL PROCESS

The second appeal provides an opportunity for appellants to dispute the appeal decision made by the regional administrator. The assistant administrator for the Mitigation Directorate is the decision-maker on second appeals.[329] The assistant administrator's decision will be the final administrative decision of FEMA.[330] Figure 14 outlines the second appeal process for HMGP Post Fire.

[328] 44 CFR § 206.440(b)
[329] 44 CFR § 206.440(b)(2)
[330] 44 CFR § 206.440(e)(3)

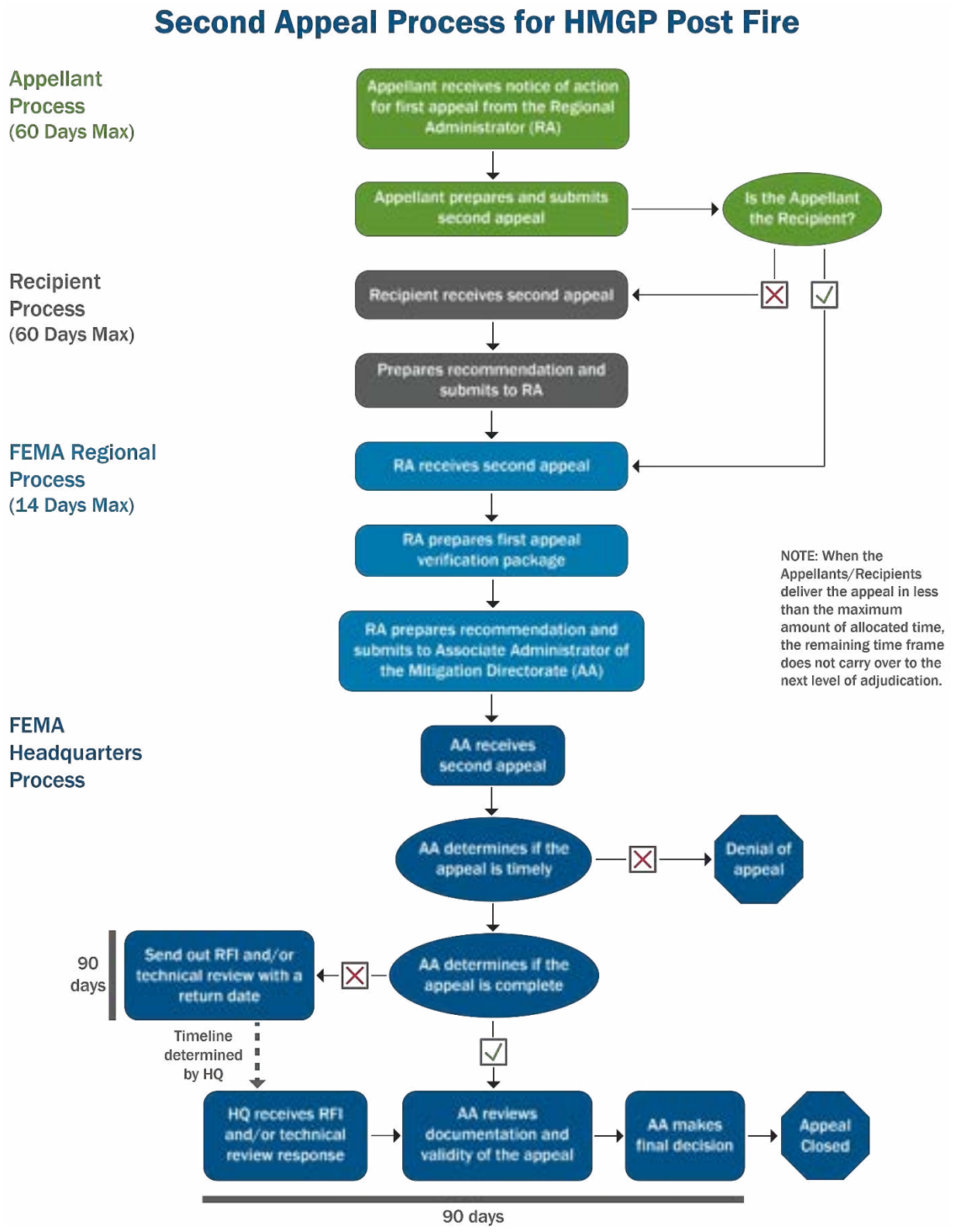

Figure 14. HMGP Post Fire Second Appeal Process Flowchart

B.13.6.1. HMGP Post Fire: Second Appeal Actions – Appellant

To begin the second appeal process, appellants must submit documentation to FEMA within 60 calendar days after receiving the initial notice of the action on the first appeal. When the appellant is the subapplicant/subrecipient, the appeal must be submitted to the recipient prior to the expiration of the 60-day period.

B.13.6.2. HMGP Post Fire: Second Appeal Actions – Recipient

The recipient reviews the appeal and prepares a recommendation to submit to the FEMA regional administrator. The appeal and supporting documentation must be forwarded to the regional administrator within 60 calendar days of receipt of the second appeal. When the appellant is the recipient, no recommendation is needed because the appeal acts as its disposition. Otherwise, the recipient acts as the reviewer.

B.13.6.3. HMGP Post Fire: Second Appeal Actions – Region

Upon receipt of the appeal package from the recipient, the FEMA regional administrator will review the package for regulatory requirements. Once completed, the regional administrator will forward the appeal, along with a recommendation, to the associate administrator for the Mitigation Directorate.

An appeal verification package confirms that the appellant is eligible for a second appeal. As part of the verification package, the region should prepare the following items to submit to FEMA headquarters:

- A decision letter that documents the initial action taken by the region or recovery office regarding the HMGP Post Fire application or subapplication which precedes the first appeal and usually outlines the basis for denial.
- The set of first appeal documents submitted by the appellant opposing the decision letter.
- The recipient recommendation for first appeal, which documents the recipient's position on the first appeal (if applicable).
- A notice of the action that documents the first appeal decision of the FEMA regional administrator, which is typically the action disputed in the second appeal.
- The set of second appeal documents submitted by the appellant opposing the notice of the action (first appeal decision).
- An appeal recommendation from the regional administrator and/or recovery office that documents the region's preliminary review of the second appeal. If the appellant submits supplemental information, the region should note these changes. No matter which office (region or recovery office) provides the second appeal, the recommendation must accompany the appeal submission to FEMA headquarters.

B.13.6.4. HMGP Post Fire: Second Appeal Actions – FEMA Headquarters

Upon receipt from the region, FEMA headquarters will make an independent assessment of the appeal. If all documentation is included, the assistant administrator for the Mitigation Directorate notifies the recipient in writing of the disposition of the appeal within 90 calendar days. If additional information is needed, regardless of an internal or external request, FEMA headquarters determines a date by which the RFI must be returned. In cases when the appeal requires a highly technical analysis, FEMA headquarters will consult an independent scientific or technical expert on the subject. Once FEMA headquarters has completed the RFI and technical review processes, FEMA headquarters notifies the recipient in writing of the disposition within 90 calendar days. The assistant administrator for the Mitigation Directorate makes the final decision.[331] If the appeal deals with a mitigation planning subaward, the assistant administrator will coordinate with the National Mitigation Planning program.

A FEMA delay in issuing a decision beyond the applicable 90 or 180 calendar days does not compel the FEMA regional administrator or associate administrator to decide in the appellant's favor.

C. Building Resilient Infrastructure and Communities Program

This section contains supplemental guidance specific to the BRIC program. If there are any inconsistencies between the HMA Guide and the applicable Notice of Funding Opportunity (NOFO), then the requirements in the applicable NOFO prevail.

C.1. BRIC: Guiding Principles

The BRIC program seeks to implement the following guiding principles to help communities undertake hazard mitigation projects to reduce risks they face from potential natural hazard events:

- Support state and local governments, tribes and territories through capability- and capacity-building to enable them to identify mitigation actions and implement projects that reduce risks posed by natural hazards.
- Encourage and enable innovation while allowing flexibility, consistency and effectiveness.
- Promote partnerships and enable high-impact investments to reduce risk from natural hazards with a focus on critical services and facilities, public infrastructure, public safety, public health and communities.
- Provide a significant opportunity to reduce future losses and minimize impacts on the Disaster Relief Fund (DRF).

[331] 44 CFR § 206.440(e)(3)

- Promote equity, including by helping members of disadvantaged groups and prioritizing 40% of the benefits to disadvantaged communities as referenced in Executive Order (EO) 14008 on Tackling the Climate Crisis at Home and Abroad (Jan. 27, 2021) in line with the Administration's Justice40 Initiative.

- Support the adoption and enforcement of building codes, standards and policies that will protect the health, safety and general welfare of the public, considering future conditions, prominently including the effects of climate change, and have long-lasting impacts on community risk reduction, including for critical services and facilities and for future disaster costs.

Additional guiding principles also may be outlined in the NOFO governing the respective BRIC application cycle.

C.2. BRIC: Eligibility

For specific eligibility criteria to receive assistance under BRIC, including eligible applicants and subapplicants, refer to the FEMA "Building Resilient Infrastructure and Communities" webpage and the BRIC NOFO for the year funding is sought. General eligibility and requirements are also detailed in Part 4.

C.2.1. BRIC: ELIGIBLE ACTIVITIES

BRIC eligible activities and requirements can be found in the most recent year NOFO.

C.2.1.1. BRIC: Capability and Capacity Building Activities

Under BRIC, FEMA may provide financial assistance in the allocation to applicants to carry out the following activities:

- Expand or improve the administration of mitigation assistance.

- Mitigate risk by creating and supporting partnerships.

- Develop or update mitigation priorities and plans.

- Pursue project-scoping activities.

- Establish, adopt and enforce codes and standards consistent with applicable law.

- Reduce vulnerability by identifying and implementing other hazard-mitigation activities, enhancing public safety, and improving the resilience of communities and critical infrastructure to natural hazards.

All capability- and capacity-building activities should result in a resource, strategy or tangible mitigation product that will reduce or eliminate risk and damage from future natural hazards,

increase resilience and public safety, and promote a culture of preparedness. Capability- and capacity-building activities that have already been initiated or completed are not eligible for assistance.

C.2.1.2. BRIC: Non-Financial Direct Technical Assistance

FEMA may provide non-financial direct technical assistance to promote the BRIC program, identify potential mitigation projects, develop and review applications and mitigation plans, and provide training on grants management. Additional information about the availability of technical assistance will be included in the NOFO.

C.2.1.3. BRIC: Mitigation Projects

FEMA may provide competitively awarded financial assistance to applicants to implement cost-effective mitigation projects designed to increase resilience and public safety and reduce injuries, loss of life, and damage and destruction of property, including damage to critical services and facilities.

C.2.1.4. BRIC: Management Costs

FEMA may provide financial assistance to reimburse the recipient and subrecipient for eligible and reasonable indirect costs, direct administrative costs and other administrative expenses associated with a specific mitigation measure or project in an amount up to 15% of the total amount of the grant award, of which not more than 10% of the total award amount may be used by the recipient and 5% by the subrecipient for such costs.

C.3. BRIC: Available Assistance

For available assistance under BRIC, refer to the FEMA "Building Resilient Infrastructure and Communities" webpage and the NOFO for the year funding is sought.

C.4. BRIC: Assistance Restrictions

Assistance is available only in states and territories that have received a major disaster declaration in the previous seven years. Assistance is also available to federally recognized tribal governments who have received a major disaster declaration or are located partially or entirely within the boundaries of such states in accordance with 42 U.S.C. § 5133(g).

FEMA will allocate assistance to states and territories for eligible activities consistent with the applicable statutory base and/or maximum allocations in the authorizing and appropriation laws. FEMA will administer the program as directed by Congress.

FEMA may include additional BRIC assistance restrictions in the NOFO. Such restrictions may include but are not limited to:

- An allocation to each state and territory applicant for mitigation capability- and capacity-building activities and mitigation projects.
- A set-aside for an allocation to eligible tribal government applicants for mitigation capability- and capacity-building activities and projects.
- An allocation of a portion of the assistance on a competitive basis among eligible applicants.

For all BRIC assistance restrictions, refer to the NOFO for the applicable year. The NOFO supersedes the information located within the HMA Guide.

C.5. BRIC: Management Costs

FEMA may provide financial assistance to reimburse the recipient and subrecipient for eligible and reasonable indirect costs, direct administrative costs and other administrative expenses associated with a specific mitigation measure or project. Applicants may apply for applicant management costs of up to 10% of the total BRIC grant application for management of the award and all selected subawards. Applicants requesting management costs must submit a separate management costs subapplication.

Subapplicants may apply for a maximum of 5% of the total funds requested in a subapplication for management costs. Subapplicants requesting management costs must include them as a separate line item in the subapplication budget. Additional management costs considerations may be found in the NOFO. If any requirements in the HMA Guide conflict with the NOFO, the requirements in the NOFO take precedence.

C.6. BRIC: Application Period

For information regarding the BRIC application period, refer to the FEMA "Building Resilient Infrastructure and Communities" webpage and the NOFO for the year funding is sought.

C.7. BRIC: Cost Share

Generally, FEMA may provide up to 75% of the cost of eligible mitigation activities under BRIC. FEMA may provide up to 90% of the cost of eligible mitigation activities for small impoverished communities.[332] FEMA will provide 100% federal assistance for eligible management costs. The appropriate year's NOFO may contain additional information about cost share availability.

Applicants cannot apply other federal award assistance toward the BRIC non-federal cost share unless the other federal statutory authority allows the assistance to be used to meet cost share

[332] 42 U.S.C. § 5133(h)

requirements.[333] FEMA encourages innovative use of public and private-sector partnerships to meet the non-federal cost share.

C.7.1. BRIC: SMALL IMPOVERISHED COMMUNITIES

Small impoverished community subapplicants are eligible for an increase in cost share up to 90% federal/10% non-federal under the BRIC program. Small impoverished communities are also known as economically disadvantaged rural communities. Non-federal cost share may consist of cash, donated or third-party in-kind services, materials or any combination thereof.

A small impoverished community must be both:

- A community of 3,000 or fewer individuals identified by the applicant.
- Economically disadvantaged, with residents having an average per capita annual income not exceeding 80% of the national per capita income, based on the best available data. [334]

Applicants must certify and provide documentation of the community or jurisdictional status with the appropriate subapplication to justify the 90% cost share. If documentation is not submitted with the subapplication, FEMA will provide no more than the standard 75% of the total eligible costs.

Federally recognized tribal governments meeting the definition of a small impoverished community that apply to FEMA directly as applicants are eligible for a 90% federal cost share for their subapplications, which make up their overall BRIC grant application.

C.8. BRIC: Subapplication Requirements

For subapplications submitted to the national competition, the subapplicant, in coordination with the applicant, must identify a series of go/no-go milestones throughout the work schedule for mitigation activities that FEMA will review and approve. A go/no-go milestone is a major milestone in the project that if not completed on time may result in a cancellation of the subaward. Progress toward meeting the go/no-go milestones must be reported in the Quarterly Progress Reports submitted to the recipient and FEMA. At these go/no-go milestones, FEMA will evaluate the project's performance, schedule adherence and contribution to FEMA's program goals and objectives. As of the BRIC fiscal year 2022 NOFO, go/no-go milestones are required for national competition awards. Additional information on go/no-go milestone requirements can be found in the yearly NOFOs.

C.9. BRIC: Applicant Ranking of Subapplications

Applicants must rank each subapplication included in their application in order of their priority for assistance. Each subapplication must be assigned a unique rank in the electronic application

[333] 2 C.F.R. § 200.306(b)(5)
[334] 42 U.S.C. § 5133(a)

system. Applicants must explain the rank given to each subapplication and demonstrate how it is consistent with their state or tribal (standard or enhanced) mitigation plan.

C.10. BRIC: Award Selection

FEMA will consider subapplications for further review based on a four-part review:

1. Eligibility and Completeness.
2. National Technical Review (mitigation projects only).
3. Technical Criteria.
4. Qualitative Criteria.

FEMA may identify a subapplication for further review out of rank order based on considerations such as program priorities, available assistance and policy factors.

FEMA will notify applicants whose subapplications are identified for further review. However, this notification and the applicant's compliance with FEMA-requested pre-award activities are not considered notification or guarantee of an award.

C.11. BRIC: Quarterly Progress Reports

Recipients are required to submit quarterly financial and progress reports to FEMA as a condition of their award acceptance throughout the period of performance, including partial calendar quarters, as well as for periods where no award activity occurs. Future awards and fund drawdowns may be withheld if these reports are delinquent, demonstrate a lack of progress or are insufficient in detail. Recipients are also required to submit closeout reports, which consist of the final financial and performance reports.

Recipients must include progress toward their go/no-go milestones in their Quarterly Progress Reports. Table 13 describes the Quarterly Progress Report due dates.

Table 13: BRIC Quarterly Progress Report Timing

Quarter	Quarter Dates	Report Due Dates
1	Oct. 1 – Dec. 31	Jan. 30
2	Jan. 1 – March 31	April 30
3	April 1 – June 30	July 30
4	July 1 – Sept. 30	Oct. 30

C.11.1. BRIC: FINANCIAL REPORTING REQUIREMENTS

Recipients must report obligations and expenditures on a quarterly basis through the Federal Financial Report to FEMA. Recipients must file the Federal Financial Report electronically. Award recipients must submit a Federal Financial Report quarterly throughout the period of performance, including partial calendar quarters, as well as for periods where no award activity occurs.

C.11.2. BRIC: PROGRESS REPORTING REQUIREMENTS

Recipients must submit a Quarterly Progress Report to FEMA in the electronic application system throughout the period of performance, including partial calendar quarters, as well as for periods where no award activity occurs.

Reports are due within 30 calendar days from the end of the first federal quarter, following the initial award and thereafter until the award ends.

For more information regarding BRIC reporting requirements, refer to the NOFO.

C.12. BRIC: Appeal Process

An eligible applicant/recipient or subapplicant/subrecipient may request an appeal of either of the following actions:

- FEMA's denial of its application or subapplication for mitigation activities for which there is an indication of a substantive technical or procedural error.
- A remedy FEMA has taken for non-compliance with federal statutes, regulations or the terms and conditions of the award that results in suspension or termination of all or part of the award.

FEMA provides only one opportunity to appeal a determination. FEMA will only consider written appeals that justify the request for reconsideration.

Whether the appeal originated with the applicant/recipient or with a subapplicant/subrecipient, the applicant or recipient must submit an appeal in writing to the deputy associate administrator for the Mitigation Directorate within 60 calendar days after receiving a notice of the action that is being appealed.

The subapplicant/subrecipient must submit its appeal in writing to the recipient, after which the recipient must review and evaluate the subrecipient's appeal before submission to FEMA. The recipient must forward all appeals from a subrecipient with a written recommendation to FEMA within 60 calendar days of receiving the appeal from a subrecipient.

For denials of applications or subapplications for mitigation activities, the appeal must identify any substantive technical or procedural error committed by FEMA. FEMA will only consider the information provided in the application or subapplication as supporting documentation.

For remedies FEMA has taken for non-compliance, the appeal must contain documented justification supporting the appellant's position; specify the monetary figure or FEMA action in dispute; and identify the provisions in federal law, regulation or policy with which the appellant believes the initial action was inconsistent.

The applicant, subapplicant, recipient or subrecipient will be notified in writing of the disposition of the appeal or the need for additional information. For more information regarding the BRIC appeal process, refer to the NOFO.

C.12.1. BRIC: APPEAL REVIEW AND DETERMINATION

Upon receipt of the appeal, FEMA reviews the appeal content and uses the administrative record and the laws, regulations and policies applicable to the respective case to analyze the appeal. FEMA may request additional information via an RFI to adequately adjudicate the appeal or make its decision based on the documentation and information provided at the time of appeal submission. Within 90 calendar days of receiving the appeal, FEMA takes one of the following three actions:

- Requesting additional information specifying the date FEMA must receive information. Within 90 calendar days of receiving the information (or within 90 calendar days of the expiration of the deadline to respond), FEMA provides the appeal decision to the recipient.
- Submitting the appeal to an independent expert or experts for technical review and recommendations. Within 90 calendar days of receiving the technical review recommendations, FEMA provides the appeal decision to the recipient.
- Providing a written decision to the recipient using a method that confirms receipt (through electronic application systems, return receipt mail, email with read-receipt acknowledgment or other methods that confirm receipt).

If the decision is to grant the appeal, FEMA headquarters will take the appropriate action.

C.12.2. BRIC: REQUEST FOR INFORMATION APPEAL

If additional information is needed, FEMA will determine a date by which the information must be provided. Within 90 calendar days following the receipt of the requested additional information (or 90 calendar days after the information was due), FEMA will notify the recipient in writing of the disposition of the appeal.

FEMA generally issues an RFI when it identifies specific documentation or information that if provided might impact the outcome of the appeal or assist FEMA in adequately responding to the appeal.

D. Flood Mitigation Assistance

This section contains supplemental guidance specific to FMA. If there are any inconsistencies between the HMA Guide and the applicable Notice of Funding Opportunity (NOFO), then the requirements in the applicable NOFO prevail.

D.1. FMA: Eligibility

FMA is a competitive program. For specific eligibility criteria to receive assistance under FMA, refer to the "Flood Mitigation Assistance Grant" webpage and the FMA NOFO for the year funding is sought. In addition, general eligibility and requirements are detailed in Part 4.

D.1.1. FMA: ELIGIBLE PROPERTIES

Properties included in a project subapplication for FMA must be insured by the National Flood Insurance Program (NFIP) prior to the opening of the application period and be maintained for the life of the structure. [335] For projects where structures remain (elevation, reconstruction, floodproofing, etc.), flood insurance must be maintained through the completion date of the mitigation activity and for the life of the structure. For projects where no structures remain (acquisition and demolition, relocation, etc.) flood insurance must be maintained until the property is purchased by the subrecipient; the structure must be demolished and removed within 90 days of settlement.[336] Absence of flood insurance where required may be grounds for ineligibility of the project and denial of reimbursement or recoupment of grant funds.

Under certain circumstances, properties may be eligible for a federal cost share greater than 75%. Properties must meet one of the two definitions below to receive an increased federal cost share:[337]

- The property is a severe repetitive loss structure. [338] In this case, the property is eligible for a 100% federal cost share. A severe repetitive loss structure is a structure that is covered under an NFIP policy and has incurred flood-related damage:
    - For which four or more separate claims payments have been made under flood insurance coverage with the amount of each claim (including building and contents payments) exceeding $5,000 and with the cumulative amount of such claims payments exceeding $20,000; or

[335] 44 CFR § 77.6 (a)(2)
[336] 44 CFR § 80.17(d)
[337] Section 1370 of the National Flood Insurance Act of 1968, Public Law 90-448 (Aug. 1, 1968), as amended; 42 U.S.C. § 4104c(h)(2)
[338] 42 U.S.C. § 4104c(h)(3)

- For which at least two separate flood insurance claims payments (building payments only) have been made, with the cumulative amount of such claims exceeding the value of the insured structure.

- The property is a repetitive loss structure.[339] In this case, the structure is eligible for a 90% cost share. A repetitive loss structure is a structure covered under an NFIP policy that:
  - Has incurred flood-related damage on two occasions, in which the cost of repair, on average, equaled or exceeded 25% of the value of the structure at the time of each such flood event; and
  - At the time of the second incidence of flood-related damage, the contract for flood insurance contains increased cost of compliance coverage.

There have been multiple statutory definitions for repetitive loss structures over time. For a structure to be eligible for an increased federal cost share for FMA assistance, a property must meet either the FMA repetitive loss or severe repetitive loss definition in 42 U.S.C. § 4104c(h)(2), as amended.

D.1.2. FMA: FINANCIAL TECHNICAL ASSISTANCE

FEMA may provide financial technical assistance to any applicant awarded at least $1 million (federal share) in FMA grants in the prior fiscal year.[340] A technical assistance award cannot exceed $50,000 (federal share) to any single applicant in any fiscal year.

Eligible technical assistance activities may include:

- Promoting FMA to communities.
- Visiting sites with communities/applicants.
- Delivering technical assistance to support mitigation planning.
- Developing and reviewing project applications.
- Participating in planning meetings.
- Providing planning workshops/materials.
- Performing Benefit-Cost Analysis and providing grants management workshops/materials.
- Funding, in part, salaries and expenses of staff working to develop, review, monitor and close FMA awards and subawards.

[339] 42 U.S.C. § 4121(a)(7)
[340] 42 U.S.C. § 4104c(c)(3)(J); 44 CFR § 77.6(c)(3)

Essentially, a technical assistance award and a management costs award can achieve many of the same objectives. A technical assistance award is meant to allow recipients to maintain a viable FMA program over time. Applicants must ensure activities are not duplicated between the two awards. For instance, duplication would exist if a technical assistance award provided assistance for project development that the applicant seeks reimbursement for under management costs. Proper record-keeping is important to ensure activities are not duplicated.

For additional information regarding FMA technical assistance, refer to the most recent NOFO.

D.2. FMA: Available Assistance

For available assistance under FMA, refer to the FEMA "Flood Mitigation Assistance Grant" webpage and the NOFO for the year funding is sought.

D.3. FMA: Assistance Restrictions

For FMA, the following assistance restrictions apply:

- Individual planning awards or subawards using FMA shall not exceed a federal share of $50,000 to any applicant or $25,000 to any subapplicant.
- FMA planning assistance can only be used to create or update a hazard mitigation plan that meets the planning criteria outlined in 44 CFR Part 201 and provides for reduction of flood losses to structures for which NFIP coverage is available.

D.4. FMA: Management Costs

FEMA may provide financial assistance to reimburse the recipient and subrecipient for eligible and reasonable indirect costs, direct administrative costs and other administrative expenses associated with a specific mitigation measure or project. Applicants may apply for applicant management costs of up to 10% of the total FMA application for management of the award and all selected subawards.[341] Applicants requesting management costs must submit a separate management costs subapplication.

Subapplicants may apply for a maximum of 5% of the total funds requested in a subapplication for management costs.[342] Subapplicants requesting management costs must include them as a separate line item in the project or planning subapplication. Additional management costs requirements may be found in the NOFO. If any requirements in the HMA Guide conflict with the NOFO, the requirements in the NOFO take precedence.

[341] 44 CFR § 77.7(a)(1)(i)
[342] 44 CFR § 77.7(a)(1)(ii)

D.5. FMA: Application Period

For information regarding the FMA application period, refer to the FEMA "Flood Mitigation Assistance Grant" webpage and the NOFO for the year funding is sought.

D.6. FMA: Cost Share

Consistent with the legislative changes made in the Biggert-Waters Flood Insurance Reform Act of 2012 to the National Flood Insurance Act of 1968, cost share availability under FMA depends on the type of properties included in the subapplication. [343]

FEMA's contributions to the federal share are outlined below:

- In the case of mitigation activities to severe repetitive loss structures, FEMA may contribute to an amount up to either of the following:
  - 100% of all eligible costs if the activities are technically feasible and cost effective.
  - The expected savings to the National Flood Insurance Fund from expected avoided damage through acquisition or relocation activities if the activities will eliminate future payments from the National Flood Insurance Fund for severe repetitive loss structures through an acquisition or relocation activity.
- In the case of mitigation activities to repetitive loss structures, FEMA may contribute to an amount up to 90% of all eligible costs.
- In the case of all other activities, FEMA may contribute to an amount up to 75%.

The appropriate year's NOFO may contain additional information about cost share availability.

Structures with varying cost share requirements can be submitted in one application. Applicants must provide documentation in the project application showing how the final cost share was derived. Applicants must enter the final cost share into the electronic application system and attach documentation to the application showing how the final cost share was derived.

D.7. FMA: Applicant Ranking of Subapplications

Applicants must rank each subapplication included in their application in order of priority for assistance. Each subapplication must be assigned a unique rank in the electronic application system. Applicants must explain the rank given to each subapplication and demonstrate how it is consistent with their state or tribal (standard or enhanced) mitigation plan.

[343] Public Law 112-141 (July 6, 2012); Public Law 90-448 (Aug. 1, 1968), as amended, 42 U.S.C. § 4104(d)

D.8. FMA: Award Selection

FEMA will identify subapplications for further review based on several criteria including but not limited to savings to the National Flood Insurance Fund, applicant rank and property status (e.g., repetitive loss structure, severe repetitive loss structure). FEMA also may identify a subapplication for further review out of rank order based on considerations such as program priorities, available assistance and other factors.

FEMA will notify applicants whose subapplications are identified for further review. However, this notification and the applicant's compliance with FEMA-requested pre-award activities are not considered notification or guarantee of an award.

D.9. FMA: Quarterly Progress Reports

Recipients are required to submit quarterly financial and progress reports to FEMA as a condition of their award acceptance throughout the period of performance, including partial calendar quarters, as well as for periods where no award activity occurs. Future awards and fund drawdowns may be withheld if these reports are delinquent, demonstrate a lack of progress or are insufficient in detail. Recipients are also required to submit closeout reports, which consist of the final financial and performance reports.

Table 14 describes the Quarterly Progress Report due dates.

Table 14: FMA Quarterly Progress Report Timing

Quarter	Quarter Dates	Report Due Dates
1	Oct. 1 – Dec. 31	Jan. 30
2	Jan. 1 – March 31	April 30
3	April 1 – June 30	July 30
4	July 1 – Sept. 30	Oct. 30

D.9.1. FMA: FINANCIAL REPORTING REQUIREMENTS

Recipients must report obligations and expenditures on a quarterly basis through the Federal Financial Report to FEMA. Recipients must file the Federal Financial Report electronically. Award recipients must submit a Federal Financial Report quarterly throughout the period of performance, including partial calendar quarters, as well as for periods where no grant award activity occurs.

D.9.2. FMA: PROGRESS REPORTING REQUIREMENTS

Recipients must submit a Quarterly Progress Report to FEMA through the electronic application system throughout the period of performance, including partial calendar quarters, as well as for periods where no award activity occurs.

Reports are due within 30 calendar days from the end of the first federal quarter, following the initial award and thereafter until the award ends.

For more information regarding FMA reporting requirements, refer to the NOFO.

D.10. FMA: Failure to Make Federal Award Within Five Years

Any subapplication not awarded within five years of the date of the application is considered to be denied. Any assistance amounts allocated for such applications will remain in the National Flood Insurance Fund and will be made available for future awards.[344]

D.11. FMA: Reconsideration

An eligible applicant/recipient or subapplicant/subrecipient may request a reconsideration of either of the following actions:

- FEMA's denial of its application or subapplication for mitigation activities for which there is an indication of a substantive technical or procedural error.
- A remedy FEMA has taken for non-compliance with federal statutes, regulations or the terms and conditions of the award, including suspension and termination of the award.[345]

For more information regarding the FMA reconsideration process, refer to the applicable NOFO.

D.11.1. FMA: DENIAL OF APPLICATION OR SUBAPPLICATION

For denials of applications or subapplications for mitigation activities, the reconsideration request must identify any substantive technical or procedural error committed by FEMA.

For more information regarding the denial of a FMA application or subapplication, refer to the applicable NOFO.

[344] 42 U.S.C. § 4104c(g)
[345] 2 CFR § 200.342

D.11.2. FMA: DENIAL OF REMEDIES TAKEN FOR NON-COMPLIANCE

FEMA will reconsider determinations of non-compliance, additional award conditions or its decision to terminate a federal award. The recipient must send information for reconsideration to FEMA headquarters within 60 days after receipt of a notice of the action.

A FEMA decision will uphold or overturn a decision regarding an award based on information provided by the recipient and subrecipient as well as application, award and subaward management records collected by FEMA. FEMA will notify the recipient of its decision regarding the request for reconsideration.[346]

HMA Program-Specific Resources

- How a Disaster Gets Declared: https://www.fema.gov/disasters/how-declared
- *Strategic Funds Management Initiative* Memorandum: https://www.fema.gov/sites/default/files/2020-09/fema_strategic_funds_management_memorandum_06-11-12.pdf
- *Public Assistance Reasonable Cost Evaluation – Hazard Mitigation Grant Program Crosswalk* FEMA job aid: https://www.fema.gov/sites/default/files/2020-07/reasonable-costs-crosswalk_3-23-2020.pdf
- *Checklist: Hazard Mitigation Grant Program Administrative Plan*: https://www.fema.gov/sites/default/files/2020-10/fema_hazard_mitigation_grant_program_admin_plan_checklist_03-29-19.pdf
- FEMA Program Support Material: *Application Support Materials for the Hazard Mitigation Grant Program*: https://www.fema.gov/grants/mitigation/hazard-mitigation/when-you-apply/program-support-materials
- FEMA Program Support Material: *BRIC Direct Technical Assistance*: https://www.fema.gov/grants/mitigation/building-resilient-infrastructure-communities/direct-technical-assistance
- FEMA Program Support Material: *BRIC Project Scoping Activities*: https://www.fema.gov/grants/mitigation/building-resilient-infrastructure-communities/resources
- FEMA Program Support Material: *BRIC Partnership Activities* https://www.fema.gov/grants/mitigation/building-resilient-infrastructure-communities/resources

[346] 44 CFR § 77.8(e)

- FEMA Program Support Material: *Resources for the Flood Mitigation Assistance Grant Program*: https://www.fema.gov/grants/mitigation/floods/fma-resources

Part 11. Capability- and Capacity-Building

This section provides guidance on capability and capacity-building activities that are generally eligible for Hazard Mitigation Assistance (HMA). Each activity section generally follows the same outline by first providing an overview of the project type, followed by eligibility criteria and a description of eligible activities, application and submission information, subaward implementation, closeout and additional resources. To be eligible for HMA, all mitigation activities must meet the general eligibility criteria and other requirements described in Part 4.

A. Hazard Mitigation Planning and Planning-Related Activities

A.1. Overview of Mitigation Planning

State, local, tribal and territorial governments rely on Hazard Mitigation Assistance (HMA) planning grants to create a robust mitigation planning process. This process engages partners and stakeholders to identify and implement actions to improve community resilience.

Hazard mitigation planning is foundational for mitigation and resilience investments. Mitigation plans are strategic documents, updated every five years, to guide hazard mitigation programs to reduce risk over the long-term, such as over the lifespan of a community asset. Mitigation is most effective when it is integrated with comprehensive, long-term community and economic planning before a hazard event occurs.

The purpose of mitigation planning is to identify state, local, tribal and territorial government policies, programs and actions that can be implemented to reduce risk and future losses, over the long term, from future hazard events. These mitigation policies, programs and actions are identified by assessing natural hazards and their risks to and the vulnerability of people, property, infrastructure and the economy, while involving a wide range of stakeholders in the planning process. The planning process evolves into a comprehensive mitigation strategy that reduces the identified risks. Therefore, the mitigation strategy section of the plan identifies a range of specific mitigation actions and activities. This section includes an action plan describing how identified mitigation activities will be prioritized, implemented and administered.[347]

[347] 44 Code of Federal Regulations (CFR) § 201.6(c)(3)(iii),

In summary, a mitigation plan demonstrates the commitment to reduce risks and vulnerabilities from natural hazards and serves as a strategic guide for a wide range of decision-makers as they commit public or private resources to increasing individual and community resilience.

Regulations outline the following types of plans for which the Federal Emergency Management Agency (FEMA) has issued mitigation planning guidance:

- State mitigation plan: 44 Code of Federal Regulations (CFR) § 201.4; and FEMA Policy FP 302-094-2: *State Mitigation Plan Review Guide* (March 6, 2015) and *State Mitigation Planning Policy Guide* (April 19, 2022) which will supersede the 2015 edition as of April 19, 2023.
- Enhanced state mitigation plan: 44 CFR § 201.5 and FEMA Policy FP 302-094-2: *State Mitigation Plan Review Guide* (March 6, 2015) and *State Mitigation Planning Policy Guide* (April 19, 2022) which will supersede the 2015 edition as of April 19, 2023.
- Tribal mitigation plan: 44 CFR § 201.7 and FEMA Policy FP 306-112-1: *Tribal Mitigation Plan Review Guide* (Dec. 5, 2017).
- Enhanced tribal mitigation plan: 44 CFR § 201.5, 44 CFR § 201.7 and FEMA Policy FP 306-112-1: *Tribal Mitigation Plan Review Guide* (Dec. 5, 2017).
- Local mitigation plan: 44 CFR § 201.6; FEMA guidance: *Local Mitigation Plan Review Guide* (Oct. 1, 2011); and FEMA Policy FP-206-21-0002: *Local Mitigation Planning Policy Guide* (April 19, 2022) which will supersede the 2011 *Local Mitigation Plan Review Guide* as of April 19, 2023.

To apply for and receive assistance under any HMA program, applicants and subapplicants generally must have an approved mitigation plan that meets all regulatory, HMA policy and mitigation planning policy requirements.[348]

In addition to having a mitigation plan that meets the requirements, states and tribes may develop enhanced plans. To obtain enhanced plan status, states and tribes must demonstrate to FEMA the ability to develop and implement a comprehensive approach to mitigation, the ability to effectively use available resources to reduce risks and increase resilience, and the capability to manage increased Hazard Mitigation Grant Program (HMGP) assistance.

HMA programs also provide assistance for planning-related activities. Planning-related activities assist state, local, tribal and territorial governments in updating their mitigation strategies after a disaster, enhancing the current plan with new data or information, delivering planning-related

[348] 44 CFR § 201.4(a), 44 CFR § 201.6(a), 44 CFR § 201.7(a); (as applicable), and 44 CFR § 206.434(b)

training, adopting land use ordinances to increase resilience, and integrating mitigation plans into other planning efforts.

A.2. Mitigation Planning Process

To obtain assistance under any HMA program, state, local, tribal and territorial governments must generally have a FEMA-approved hazard mitigation plan.[349]

The purpose of mitigation planning is for state, local, tribal and territorial governments to identify the natural hazards that impact them and actions and activities to reduce any losses from those hazards, as well as establish a coordinated process to implement the plan, taking advantage of a wide range of resources.[350] Identifying risks and developing broad long-term strategies for protecting people and property from future events is key in breaking the cycle of disasters and repeated damage. Regulations addressing hazard mitigation plans can be found at 44 CFR Part 201.

The mitigation planning process varies from jurisdiction to jurisdiction, but regardless of the plan type, a state, local, tribal or territorial mitigation plan development/update process comprises the following four phases.

A.2.1. ASSEMBLE RESOURCES

A state, local, tribal or territorial government may organize needed planning resources for a successful mitigation planning process, such as securing technical expertise; defining the planning area; and identifying key individuals, agencies, neighboring jurisdictions, businesses or other stakeholders to participate in the process.

Stakeholder engagement during plan development can provide important information about community needs and have significant impacts on proposed actions for HMA applications or subapplications. State, local, tribal and territorial governments are encouraged to include representatives of the whole community in planning and scoping the project to gain broad community participation and support. Building on existing community networks can also be critical for generating broad support for future, specific mitigation activities.

During this phase, it is important to define the planning area including identifying assets that may be outside of jurisdictional boundaries but should be taken into consideration in the planning process (e.g., a drinking water reservoir owned by a city but located in another jurisdiction).

A.2.2. ASSESS RISKS

The state, local, tribal or territorial government may then assess risks by identifying the characteristics and potential consequences of hazards. It is important to understand what

[349] 44 CFR § 206.434(b), 44 CFR § 201.1
[350] 44 CFR § 201.1(b)

geographic areas each hazard might impact and what people, property or other assets might be vulnerable. A risk assessment generally consists of hazard identification, hazard profiles, asset inventory and an estimation of potential human and economic losses based on the exposure and vulnerability of people, buildings and infrastructure.

A.2.3. DEVELOP A MITIGATION STRATEGY

The state, local, tribal or territorial government may develop a long-term mitigation strategy for avoiding or minimizing the effects of disasters. Based on public input and identified risks, communities develop mitigation goals and objectives as part of a strategy for mitigating hazard-related losses. The strategy is a community's approach for implementing mitigation activities that are cost-effective, technically feasible and environmentally sound as well as allowing strategic investment of limited resources. The strategy is grounded in the jurisdiction's unique set of regulatory, administrative and financial capabilities to undertake mitigation. The mitigation strategy also includes a description of how the mitigation actions will be implemented and administered. Mitigation goals and objectives should be broad and inclusive of the community's mitigation priorities. These priorities may require updating during the five-year planning period because of changes to risk and vulnerability including effects of a disaster.

A.2.4. ADOPT AND APPROVE THE HAZARD MITIGATION PLAN

The next step in the process is the adoption and implementation of the hazard mitigation plan. The hazard mitigation plan must be approved and adopted by the jurisdiction or tribe, and then forwarded by the state or tribe to FEMA for review and approval.[351] Under a Program Administration by States (PAS) agreement with FEMA, some states have been delegated local plan approval; however, FEMA still issues an approval letter after the state notifies the agency that they have approved the plan. If an HMA subaward was used to develop or update the plan, failure to adopt the plan may result in disallowance of the costs. Once FEMA approves the plan, it can be used to implement hazard mitigation actions and obtain hazard mitigation assistance for specific activities.

A.2.5. IMPLEMENT AND MAINTAIN THE HAZARD MITIGATION PLAN

The applicant or subapplicant should use the mitigation plan to facilitate the development of mitigation action alternatives using FEMA and other assistance sources. Incorporating these considerations from the mitigation plan into the scoping process for potential mitigation activities funded by HMA increases the efficiency of program review and ensures that all HMA program requirements are met. The mitigation strategy is the starting point for subapplicants to identify current needs and potential mitigation activities as discussed in the following steps.

To ensure success, the plan must remain a relevant, living document through routine maintenance. The state, local, tribal or territorial government needs to conduct periodic evaluations to assess

[351] 44 CFR § 201.3(b)

changing risks and priorities and make revisions as needed. For more information, refer to the FEMA "Hazard Mitigation Planning" webpage.

State, local, tribal and territorial officials should keep their plans up to date and start the process to secure funding well in advance of the plan expiration date. HMA funding can be used to update plans. When developing an HMA subapplication or application for a hazard mitigation plan update, the subapplicant or applicant should (1) reference prior approved mitigation plans and the Mitigation Plan Review Tool for areas and suggestions on improvement in the next update cycle and (2) describe the extent to which the plan maintenance process was followed to "right size" the planning grant scope. Additionally, the applicant or subapplicant should consider scheduling time with the state, local, tribal or territorial official and/or FEMA planner to discuss the appropriate scope needed for the update based on changes in development, risk and past disaster activity.

For more information on innovative and emerging partnerships in mitigation, refer to the FEMA "Guides to Expanding Mitigation" webpage.

A.3. Eligibility

A.3.1. ELIGIBLE ACTIVITIES

Two types of planning activities may be eligible for HMA:

1. New plan creation or plan updates.
2. Planning-related activities.

The creation of a new plan and the update of an existing plan are eligible activities under HMGP, HMGP Post Fire, BRIC and Flood Mitigation Assistance (FMA). For FMA, however, there are additional restrictions that are outlined below.

Planning-related activities are eligible under HMGP, HMGP Post Fire and BRIC. Activity eligibility under BRIC is established annually through the publication of a Notice of Funding Opportunity (NOFO). If any information in this document conflicts with the NOFO, the information in the NOFO will take precedence.

A.3.1.1. New Plan Creation and Plan Updates

New plan creation and plan updates are eligible under HMGP, HMGP Post Fire, BRIC and FMA. A planning subaward for a new or updated mitigation plan must result in a mitigation plan adopted by the jurisdiction(s) and approved by FEMA, consistent with the regulatory requirements in 44 CFR Part 201 and 44 CFR Part 206 and applicable mitigation planning regulations and policy.

For FMA, a plan must provide for reduction of flood losses to structures for which National Flood Insurance Program (NFIP) coverage is available. Additionally, FEMA will only provide assistance if the community seeking the assistance is participating in the NFIP.

A.3.1.2. Planning-Related Activities

State, local, tribal and territorial governments with a current approved hazard mitigation plan are eligible to apply for assistance for planning-related activities under HMGP, HMGP Post Fire or BRIC. To expedite and strengthen the effectiveness of hazard mitigation implementation across the country, FEMA supports a variety of planning-related activities through HMGP, HMGP Post Fire and BRIC. This assistance for planning-related activities provides flexibility to further reduce risk and integrate hazard mitigation and resilience principles into other types of ongoing planning and development activities, such as making land use ordinances and building codes more disaster resilient. All planning and planning-related activities must result in a clearly defined product or products.

Under HMGP, HMGP Post Fire and BRIC, eligible mitigation planning-related activities include:

- Updating or improving sections of the current approved mitigation plan, such as:
  - Updates to the risk and vulnerability assessment based on new, targeted information. This new information may come from supporting studies, such as an economic analysis, or from incorporating data available from Risk Mapping, Assessment, and Planning (Risk MAP); FEMA; or other federal agencies.
  - Strengthening the mitigation strategy by incorporating actions to reduce vulnerabilities over the long term as well as linking proposed actions to available assistance, such as:
    - HMA.
    - Public Assistance (PA).
    - Department of Housing and Urban Development Community Development Block Grants assistance.
    - Environmental Protection Agency loans and assistance.
    - National Oceanic and Atmospheric Administration Coastal Zone Management.
    - Economic Development Administration Comprehensive Economic Development Strategy.
    - State assistance.
    - Private investments, such as from utilities and other lifelines.
  - Incorporating climate adaptation, form-based design and land use development, resilience, historic properties and cultural resources information.

  - Incorporating disadvantaged, vulnerable and/or underserved populations with unique needs, such as economic, disability and/or language considerations, into the planning process, risk assessment and/or mitigation strategy.
  - Incorporating information into the mitigation plan to gain certification under the Emergency Management Accreditation Program.
  - Integrating mitigation planning with flood management planning to gain credit under the NFIP Community Rating System (CRS).
  - Developing evaluation criteria, measures and indicators to track mitigation progress to lower risk.

- Integrating information from state, tribal, or local mitigation plans (specifically risk assessment or mitigation strategies), with other planning efforts and integrating information from other plans into state, tribal, or local mitigation plans, such as:
  - Disaster recovery strategy (pre- or post-disaster), preparedness or response plans, including disaster recovery plans to protect cultural, artistic and historic resources.
  - Comprehensive plans (e.g., land use, master, sustainability, economic development).
  - Resilience strategy.
  - Climate adaptation plans.
  - Capital improvement or economic development plans.
  - Resource management/conservation plans (e.g., stormwater, open space).
  - Other long-term community planning initiatives (e.g., transportation, housing, education, recreation, landmark and heritage, redevelopment, drought and/or wildfire).
- Building capability through delivery of technical assistance and training by:
  - Introducing officials, leaders, staff, residents, cultural stewards and other stakeholders to hazard mitigation and disaster recovery planning, including train-the-trainer activities.
  - Increasing understanding of financial tools that can be used to implement mitigation measures and develop a financing strategy (e.g., tax increment financing, coordinated infrastructure financing or historic tax credits).
  - Helping communities incorporate nature-based approaches into mitigation actions.

  - Providing communities with information on viable adaptation approaches to prevent future losses to homes, businesses and infrastructure and to preserve historic and cultural resources.

- Evaluating adoption of and/or implementation of ordinances and development codes, zoning codes, form-based codes, subdivision codes, etc. that reduce risk and/or increase resilience to future hazards by:
  - Promoting flexibility and adaptation approaches to protect historic and cultural resources.
  - Evaluating current and future built environment to assess risks and vulnerabilities.
- Integrating information from mitigation plans with climate adaptation planning efforts, such as:
  - Developing climate adaptation plans to be used as a strategic and guiding framework to evaluate and implement actions to support climate adaptation.
  - Developing a managed retreat strategy.
  - Developing or updating post-disaster recovery and redevelopment plans to incorporate climate adaptation considerations.
  - Developing or updating long-range transportation or utility plans to assess asset protection, design modifications, assess relocation and realignment, or infrastructure disinvestment.
  - Developing wetland migration plans to conserve, protect or restore ecosystems in response to rising sea levels.
  - Evaluating opportunities for other property acquisition tools such as conservation land trusts, leasebacks, land swaps and life estates.
  - Evaluating adoption and/or regulatory tools such as living shorelines, setbacks and buffers, development permit conditions and zoning and overlay zones.
  - Evaluating market-based tools such as transfer of development rights.

Information dissemination activities done in conjunction with planning-related activities, including public awareness and education, are generally eligible as a percentage of a subapplication.

A.3.2. INELIGIBLE ACTIVITIES

The following activities are not eligible as mitigation planning or planning-related activities:

- Hazard identification or mapping and related equipment that directly relate to implementing a mitigation project.
- Geographic information system software, hardware and data acquisition whose primary aim is to implement a mitigation project.

Any activities directly related to implementing a mitigation project must be included in the subapplication budget for that project. Costs related to hazard identification, hazard mapping and the geographic information system software may be eligible under the HMGP 5 Percent Initiative.

Project scoping or subapplication development activities such as Benefit-Cost Analysis, engineering feasibility studies, subapplication development, construction design, or environmental and historic preservation (EHP) data collection are not eligible as planning-related activities. These activities may be eligible as project scoping/advance assistance activities under HMGP, HMGP Post Fire, BRIC and FMA. A general list of ineligible activities is included in Part 4.

A.3.3. FUNDING RESTRICTIONS

A.3.3.1. HMGP and HMGP Post Fire 7 Percent Planning Funding

FEMA supports a variety of planning and planning-related activities through HMGP and HMGP Post Fire. In addition to hazard mitigation plans, this assistance is available for planning-related activities and provides flexibility to state, tribal and local governments to reduce risk and integrate hazard mitigation principles into planning for resilience.

The state responsibilities for planning activities are outlined in 44 CFR § 201.3(c). The provision specifies that up to 7% of a recipient's HMGP or HMGP Post Fire assistance can be used for mitigation planning under 44 CFR § 206.434. Within this percentage, there are no limits on the dollar value of the planning-related activity or the number of planning activities that can be submitted.

A.3.3.2. Building Resilient Infrastructure and Communities and Flood Mitigation Assistance Funding Restrictions

BRIC and FMA may have funding restrictions for planning and planning-related activities. Refer to the award year BRIC or FMA NOFO for more information.

A.4. Application and Submission Information

All subapplications submitted to FEMA must meet the eligibility criteria in Part 4. All subapplications must have a scoping narrative in accordance with Part 6. Specific criteria for mitigation planning subapplications are highlighted below.

FEMA may request additional information after the subapplication has been submitted to ensure all necessary information is received. However, all information required by the regulations and the guidance must be received before an assistance decision and award or final approval can be made.

A.4.1. SCOPE AND SCHEDULE FOR NEW PLAN CREATION OR PLAN UPDATES

The subapplication must:

- Include a statement that the deliverable will be an approved hazard mitigation plan that complies with the regulatory requirements at 44 CFR Part 201 and 44 CFR Part 206.
- Use applicable state, local or tribal mitigation planning guidance to determine the specific requirements for new plans and plan updates regarding the planning process; hazard identification and risk assessment; mitigation strategy; plan review, evaluation and implementation; and plan adoption.
- Include the scope of work and schedule that explains how a subapplicant will organize and execute the planning process, including how to engage with stakeholders and the public, if applicable. Generally, the scope of work also explains the planning team's role, identifies stakeholders, explains public outreach (as applicable for local and tribal governments) and specifies whether the subapplicant expects to use contract support.

The following elements must be included in the scope of work for planning grants for subapplications seeking to create or update a new or existing plan:

- **Description of previous planning efforts**: Describes past mitigation plans and mitigation efforts to identify priorities for plan updates. The FEMA plan review tool from the previous plan should be included as an attachment.
- **Description of planning area**: Describes the planning area, including any non-contiguous land holdings or assets and demographics. The description must include the number and names of participating governments, private nonprofits, or other partners. Planning areas may include governments, such as states, territories, tribal lands, cities, townships, counties or other districts. Planning areas may also be defined by watersheds or other natural features. Planning areas can crossover or encompass other jurisdictions, such as a fire protection district or a utility district.
- **List of jurisdictions participating in plan**: Lists each community that will participate in the plan and seek plan approval. A written commitment from each jurisdiction seeking plan approval will be required before assistance is obligated.
- **Public and stakeholder engagement plan**: Provides an outreach and engagement plan that describes the opportunity for the public and stakeholders to be involved in the planning process. The plan must include required meetings and public comment periods. The outreach and engagement plan must account for the time needed to incorporate public and

stakeholder feedback into the plan. If the subapplicant plans to conduct a public survey, the scope of work should describe the intent and value of the survey, how the results will be used and who the target audience is.

- **Planning process**: Provides a stakeholder and public engagement strategy that describes the planning process to engage stakeholders and the public. The description must explain the planning team's proposed role, provide the anticipated number of planning team meetings, identify stakeholders and explain public outreach.

- **Available data and risk assessment process**: Describes the planning team's process to research, collect, analyze and summarize hazard and risk data. The plan must include a description of the natural hazards that can affect the planning area. Man-made hazards may be included in the plan but are not required and will not be reviewed to meet plan requirements.

  - FEMA encourages states, tribes and territories to consider how they can create efficiencies, such as sharing relevant and scalable data and analysis with local governments to reduce costs, avoid the duplication of effort, and allow for the planning efforts to focus on mitigation strategy development. Subapplicants should generally coordinate with the state and FEMA to make use of existing data and risk assessments when developing or updating a mitigation plan.

  - Applicants and subapplicants should:

    - Describe the number of natural hazards that will be profiled.

    - If the subapplicant is completing a plan update, include a description of the data gaps and deficiencies the subapplicant is looking to fill in the updated risk assessment. If the subapplicant plans to generate new data, the subapplicant should explain the use of the new data and the value the new data will add to the plan. Explain how the new data will build a better risk assessment and mitigation strategy and describe where the source data will come from (including federal and non-federal sources) and how it will be processed.

    - Ensure the scope of work narrative includes a description of any known data sources, such as FEMA Risk MAP flood maps, to be used in the risk assessment. If the subapplicant relies on state plan data, the subapplicant should explain why the subapplicant does so. Similarly, if the subapplicant intends to develop new risk data, the subapplicant must describe the proposed process and sources.

    - Include an explanation of any geographic information system mapping and analysis needs for the plan.

    - If the subrecipient intends to use the FEMA Hazus model or other geographic information system software to support assessing vulnerability, explain the proposed

level of analysis and describe how this enhanced analysis will add value to the plan in the planning narrative.

- For local and tribal governments, if a community is participating or has participated in the Risk MAP process recently, the subapplicant must describe how the community plans to incorporate or upgrade the results of Risk MAP into the mitigation planning process. This might not apply to state plan updates.

- **Development of capabilities assessment**: Describes the process to develop strategies to address issues, challenges and obstacles jurisdictions face within given capabilities to deliver an effective mitigation program, including existing plans, programs, ordinances and policies that support long-term risk reduction efforts.

- **Development of mitigation strategy**: Describes the process to develop a mitigation strategy for each participating jurisdiction based on the risk assessment completed for the plan. For state mitigation plans, this narrative can include Coordination of Local Mitigation Planning, Severe Repetitive Loss Strategy and the Comprehensive State Hazard Mitigation Planning program. The process must include:[352]

  - An explanation of how the subapplicant intends to gather information on the status of previous mitigation actions.

  - A status report on all the previously prioritized mitigation actions if the plan is being updated. Further, the plan must include an evaluation and prioritization of new mitigation actions identified since the previous plan was approved.

- **Plan implementation, maintenance and evaluation**: Describes how the plan will be used to carry out actionable projects identified in the plan and the process to develop an implementation/maintenance and evaluation plan/strategy.

- **Plan adoption**: Describes the plan drafting process, including state and FEMA reviews, adoption by participating jurisdictions, and final approval by FEMA or the state, tribe or territory, as applicable, under the PAS delegation of local plan approval authority.

- **Schedule**: Outlines the time frame, which must match all tasks noted in the scope of work. If a proposed activity is a new or updated mitigation plan, the schedule must include tasks for draft review. It must also allow sufficient time for the state, tribe or territory and FEMA reviews; preparation of required revisions, if needed; formal adoption by the jurisdiction(s); and FEMA approval within the period of performance.

[352] 44 CFR § 201.(d)(3)

- **Deliverables, tasks and schedule**: Describes the deliverables for a new or updated approved mitigation plan consistent with mitigation planning regulations for state,[353] local[354] or tribal[355] governments as well as the applicable mitigation planning guidance. Refer to the FEMA "Hazard Mitigation Planning" webpage for additional information on state, local and tribal mitigation planning.

If communities participate in the NFIP and/or CRS, the scope of work should account for the level of effort needed to capture information related to NFIP and CRS compliance. CRS communities may receive additional points for having an adopted hazard mitigation plan; points can be maximized by undertaking the additional tasks prescribed for each mitigation planning phase. More details can be found in the *National Flood Insurance Program Community Rating System Coordinator's Manual* (2017), the and in the *Local Mitigation Planning Handbook* (March 2013) (specifically, refer to Appendix A, Worksheet 1.1).

A.4.2. SCOPE AND SCHEDULE FOR PLANNING-RELATED ACTIVITIES

Planning-related activities are not required to result in an approved mitigation plan. Instead, planning-related activities are intended to advance mitigation and resilience outcomes.

In general, a subapplication must describe the deliverable for the proposed activities in the planning narrative. The planning narrative explains how a subapplicant will organize and execute the planning-related activity. Generally, the narrative also explains the planning team's role, identifies stakeholders, explains public outreach, and specifies whether the subapplicant expects to use contract support.

A planning-related activity scope of work should include the following items:

- **Tasks**: The subapplicant must describe the tasks needed to accomplish the proposed activity as well as any procurement that would be required.

- **Alignment with current mitigation plans**: The scope of work must describe how the proposed activity aligns with the current mitigation plan or how mitigation plan information will be incorporated into other planning-related activities.

- **Public and stakeholder engagement**: The scope of work must identify the outreach and engagement plan (if applicable to the activity). The narrative should account for the time and effort it may take to incorporate public and stakeholder feedback.

- **Goals**: The scope of work must include the goals of the planning-related activity and identify specific deliverables that will be completed by the activity.

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[353] 44 CFR § 201.4 or 44 CFR § 201.5
[354] 44 CFR § 201.6
[355] 44 CFR § 201.7 or 44 CFR § 201.5

- **Implementation strategy**: The scope of work must outline the steps the subapplicant will follow to implement planning-related activities and to complete the proposed deliverables. This information must include a project schedule.

- **Deliverables, tasks and schedule**: The narrative must describe the deliverables for any mitigation planning-related activities eligible under HMGP, HMGP Post Fire and BRIC that enhance an existing mitigation plan consistent with mitigation planning regulations for state (44 CFR § 201.4 or 44 CFR § 201.5), tribal (44 CFR § 201.7 or 44 CFR § 201.5) or local governments (44 CFR § 201.6) as well as the applicable mitigation planning guidance. Refer to the FEMA "Hazard Mitigation Planning" webpage for additional information on state, tribal and local mitigation planning.

A.4.3. COSTS

A.4.3.1. Allowable Costs

Allowable costs for hazard mitigation planning and planning-related activities include:

- Pre-award costs to prepare a subapplication: Pre-award costs to prepare a subapplication must be included as separate line items and supported with a budget narrative.

- Training: Applicable training costs for the planning team to travel to and attend applicable training.

- In-kind staff time: Subapplications should identify all in-kind staff time, including costs incurred to support plan coordination and outreach. In-kind costs can be applied to meet the non-federal match, which is up to 25% of the total cost of the plan. Timesheets will be required at closeout to document expenses.

A.4.3.2. Unallowable Costs

Assistance may be subject to statutory limits (assistance restrictions) on planning and management costs as described in previous sections. Under planning and planning-related subawards, the following costs are not eligible:

- Data that is publicly available for free.

- Engineering or design costs.

- Other costs for implementing plans.

- Costs that may be part of another technical assistance, project scoping, advance assistance, or codes and standards subaward.

A.4.3.3. Budget

Budgets must be supported with documentation. Budgets must include detailed estimates of various cost item categories such as labor, materials, equipment and subcontractor costs. Lump-sum estimates are not acceptable. Subapplicants should provide a record of all documents used to develop the budget and a budget narrative that describes how each cost item in the budget was derived.

FEMA requires an itemized budget that is reasonable and cost beneficial and corresponds to the schedule. The itemized budget should be added as an attachment to the subapplication.

Budgets should include:

- An accounting for the entire period of performance to produce the plan or planning-related activity and include enough time for state and FEMA review, potential revisions and plan adoption, including grants management activities required for closing out the subaward.
- An accounting for any special studies or additional assistance needed to support an enhanced analysis and data that will be included as part of the plan or planning-related activity.
- Data research and collection, including eligible mapping activities or risk assessment.
    - If Hazus is used for flood, earthquake or hurricane risk assessments, the subapplicant should include costs for user defined/provided hazard and inventory data.
- A mitigation strategy development and prioritization.
- Professional development training, tuition and travel costs, if applicable.
- Costs related to plan drafting, state and FEMA review, revisions, and final production and distribution.
- Public outreach and stakeholder coordination efforts.
- Management costs, which are indirect costs and administrative expenses anticipated during plan development.
    - The amounts, allowable uses and procedures to request management cost assistance vary by HMA program. Refer to Part 10 for more information.
- Supportive documentation, such as contractor estimates, that should demonstrate a clear understanding of the scope of work, limitations and final outcomes of the plan.
    - If the estimate is based on carefully thought-out assumptions, it will have factored in many of the changes that come after the grant is awarded.

A.5. Subaward Implementation

A.5.1. PROGRAM REPORTING AND MONITORING

Post-award monitoring helps ensure that subapplicants/subrecipients are achieving the objectives of the federal award consistent with the performance goals and milestones described in the subaward.

To assist the recipient in monitoring plan creation, updates or planning-related activities, the following milestone information or events (if appropriate) should be included in Quarterly Progress Reports:

- If the subrecipient is acquiring contract support, the subrecipient should report when the request for proposal is completed, when the contract is out for bid, when the bid period closes, when proposals are reviewed, when the contractor is selected and the date of the kickoff meeting.
- Public meetings and/or public comment periods that have been planned or completed.
- Planning team meetings that have been planned or completed.
- For state, local and tribal plans, when the data collection and risk assessment was started and completed, and when the mitigation strategy and action plan was started and completed.
- Subrecipient's intent to submit plan for review at least 90 calendar days prior to submission.
- When participating communities have adopted the plan, if plan adoption is delayed, or if the participating community notifies the subrecipient that they do not intend to adopt the plan.
- Any other milestones that have been identified in the subapplication, agreed to or that are required by the recipient.

A.5.2. BUDGET AND SCOPE OF WORK CHANGES

Recipients are required to report deviations from budget, project scope or objectives in accordance with Part 8. Recipients must request prior approvals from FEMA for budget and program plan revisions.[356]

For subawards to develop new or updated plans, FEMA will require prior approval when a participating community identified in the scope of work chooses not to adopt a new or updated plan.

[356] 2 CFR § 200.308

A.6. Closeout

Recipients and subrecipients must close out activities in a timely manner consistent with Part 9.

The recipient must provide a statement showing all the work in the approved scope of work has been completed. For planning-related activities under HMGP, 100 percent work completion is also when all work within the approved scope of work is complete.

For the creation and update of mitigation plans, the plan must be adopted by all participating jurisdictions and all work in the approved scope of work (such as data analysis) must be completed. The recipient must provide a list of jurisdictions that are part of the multi-jurisdictional plan and indicate if the jurisdictions have or have not adopted the approved plan.

For planning-related activities, the recipient must provide a statement showing that all the work in the approved scope of work and the deliverable(s) were completed.

This information can be included in the body of the closeout letter.

Hazard Mitigation Planning Resources

- Hazard Mitigation Planning: https://www.fema.gov/emergency-managers/risk-management/hazard-mitigation-planning
- FEMA "Create a Hazard Mitigation Plan" webpage (with links to state, local and tribal plan guides): https://www.fema.gov/emergency-managers/risk-management/hazard-mitigation-planning/create-hazard-plan
- *State Mitigation Planning Policy Guide*: https://www.fema.gov/sites/default/files/documents/fema_state-mitigation-planning-policy-guide_042022.pdf
- *Local Mitigation Planning Policy Guide*: https://www.fema.gov/sites/default/files/documents/fema_local-mitigation-planning-policy-guide_042022.pdf
- *Local Mitigation Planning Handbook*: https://www.fema.gov/sites/default/files/2020-06/fema-local-mitigation-planning-handbook_03-2013.pdf
- Guides to Expanding Mitigation: https://www.fema.gov/about/organization/region-2/guides-expanding-mitigation
- Mitigation Planning Regulations and Guidance: https://www.fema.gov/emergency-managers/risk-management/hazard-mitigation-planning/regulations-guidance
- *CRS Coordinator's Manual*: https://www.fema.gov/sites/default/files/documents/fema_community-rating-system_coordinators-manual_2017.pdf

B. Project Scoping/Advance Assistance

B.1. Overview

Project scoping/advance assistance activities are designed to bridge the gap in the level of detail between the actions contained in the current approved hazard mitigation plan and project subapplications. Project scoping/advance assistance activities are also designed to obtain data to complete HMA subapplications in a timely manner, resulting in either an improvement in the capability to identify appropriate mitigation projects or in the development of an application-ready mitigation project.

Project scoping and advance assistance refer to the same activities. However, under HMGP and HMGP Post Fire, the HMA Guide uses the term "advance assistance" to align with program statutes. The name change of this activity to "project scoping" for BRIC and FMA was made to align with the purpose of this project type and provide clarity.

Advance assistance is authorized under Section 404(e)[357] of the Robert T. Stafford Disaster Relief and Emergency Assistance Act (Stafford Act).[358] Under this provision, FEMA is authorized to advance up to 25% of the HMGP ceiling or HMGP Post Fire available assistance amount, or $10 million (whichever is less), to applicants or subapplicants to accelerate the implementation of HMGP or HMGP Post Fire. Advance assistance is not automatic and is included in the HMGP ceiling or HMGP Post Fire available assistance amount.

Project scoping is authorized under BRIC and FMA. For more information on BRIC and FMA, including governing policies, visit the FEMA "Building Resilient Infrastructure and Communities" and "Flood Mitigation Assistance Grant" webpages.

B.2. Eligibility

Advance assistance must only be used to support the development of HMGP and HMGP Post Fire projects.

For BRIC and FMA, project scoping is available in accordance with the principles outlined in the respective NOFOs for the grant cycle under which a subapplicant applies. If there are any requirements in this section of the HMA Guide that conflict with the NOFO, the NOFO takes precedence.

Both applicants and subapplicants may apply for advance assistance or project scoping activities at any time during an open application period.

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[357] As amended by Section 1140 of the Sandy Recovery Improvement Act of 2013, Public Law 113-2 (Jan. 29, 2013); 42 U.S.C. § 5170c(e)

[358] Public Law 100-707 (Nov. 23, 1988); amending the Disaster Relief Act of 1974, Public Law 93-288 (May 22, 1974)

Management costs are eligible under project scoping/advance assistance subapplications.

B.2.1. ELIGIBILITY CRITERIA

Mitigation projects that are developed using project scoping/advance assistance must be both feasible and effective at mitigating the risks of the hazard(s) for which the project was designed. A project's feasibility is demonstrated through conformance with accepted engineering practices, established codes, standards, modeling techniques or best practices.

Project scoping/advance assistance activities are not required to demonstrate cost-effectiveness. However, projects that are developed using project scoping/advance assistance, which are to be submitted for future HMA consideration, must be technically feasible, cost-effective and consistent with EHP laws, regulations and executive orders. EHP requirements should be considered at the earliest possible stage of project development to allow for consideration of measures that reduce impacts to the human environment. Effective scoping to create a well-defined proposed project and identify potential EHP issues at an early stage will help facilitate the EHP review process for projects developed using project scoping/advance assistance.

When projects are sited within the Special Flood Hazard Area (SFHA), assistance received for project scoping/advance assistance activities can only be used in a jurisdiction that is participating in the NFIP.

B.2.2. ELIGIBLE ACTIVITIES

The following activities are eligible under project scoping/advance assistance:

- Scoping and developing hazard mitigation projects, including engineering design and feasibility studies. Physical work (e.g., soil tests) associated with these studies is generally eligible.
- Conducting meetings, outreach and coordination with potential subapplicants and community residents to identify potential future mitigation projects.
- Evaluating facilities or areas to determine appropriate mitigation actions.
- Incorporating environmental planning and historic preservation considerations into project planning activities.
- Collecting data for Benefit-Cost Analyses, environmental compliance and other program requirements.
- Conducting hydrologic and hydraulic studies for unmapped flood zones or other areas where communities propose to submit hazard mitigation projects.
- Coordinating, scoping and developing regional or multi-community hazard mitigation projects that require coordination to cohesively address resilience and sustainability goals.

- Using third-party cost estimation services for project budgeting across subapplications.
- Contracting services to address data consistency needs for other project application categories, such as EHP, cost-sharing mechanisms and work schedules.
- Coordinating with property owners of substantially damaged structures to review project alternatives and provide engineering and design support to bring structures into compliance with appropriate building code standards.

B.2.3. INELIGIBLE ACTIVITIES

Ineligible activities include any physical work, such as groundbreaking, construction or demolition activities. A general list of ineligible activities is included in Part 4.

B.3. Application and Submission Information

Applicants and subapplicants do not receive project scoping/advance assistance automatically. To receive assistance for project scoping/advance assistance activities, states, federally recognized tribes and territories must apply for project scoping/advance assistance in the electronic application system.

All subapplications submitted to FEMA must meet the eligibility criteria in Part 4. All subapplications must have a scoping narrative in accordance with Part 6.

A project scoping/advance assistance scope of work should include the following items:

- A description of the tasks needed to accomplish the proposed activity as well as any required procurement.
- A description of how the proposed activity aligns with the current mitigation plan.
- The outreach and engagement plan (if applicable) and an account for the time and effort it may take to incorporate public and stakeholder feedback.
- The goals of the project scoping/advance assistance activity and specific deliverables.
- The steps the subapplicant will follow to complete the project scoping/advance assistance activity and proposed deliverables. The scope of work should identify a deliverable that includes required information to determine eligibility under HMA (e.g., engineering, cost-effectiveness and EHP data, cost estimate, project schedule, design plan or specifications).
- A description of the deliverables, tasks and schedule.

FEMA may request additional information after the subapplication has been submitted to ensure all necessary information is received. However, all information required by the regulations and the guidance must be received before an assistance decision, award or final approval can be made.

B.3.1. ACTIVITY AND SCHEDULE

When submitting a subapplication to FEMA for project scoping/advance assistance, a subapplication must identify the proposed use of the assistance, including costs, and enough detail for both the proposed activity and milestones.

The scope of work narrative must describe the proposed activities and deliverables.

The schedule should include a list of milestones for each budget year. All deliverables must also be identified in the scope of work. The project schedule should note when deliverables are completed.

B.3.2. COSTS

B.3.2.1. Allowable Costs

Pre-award costs must be reasonable and identified in the budget to be considered eligible incurred costs. Refer to Part 3 for more information.

Management costs are eligible under project scoping/advance assistance subapplications.

B.3.2.2. Unallowable Costs

The recipient must submit enough financial detail to demonstrate that no costs claimed under project scoping/advance assistance are duplicated in other subapplications including those for management costs.

B.3.2.3. Budget

All subapplications must include a line-item breakdown of all anticipated costs while referencing the cost code categories on Standard Form (SF) 424: *Application for Federal Assistance*.

B.4. Subaward Implementation

Applicants and subapplicants must submit documentation to FEMA to support that they accomplished all activities listed in their project scoping/advance assistance application.

B.4.1. PROGRAM REPORTING AND MONITORING

Post-award monitoring helps ensure that subapplicants/subrecipients are achieving the objectives of the federal award consistent with the performance goals and milestones described in the subaward.

To assist the recipient in monitoring project scoping/advance assistance activities, the following milestone information or events (if appropriate) should be included in Quarterly Progress Reports:

- If the subrecipient is acquiring contract support, the subrecipient should report when the request for proposal is completed, when the contract is out for bid, when the bid period

closes, when proposals are reviewed, when the contractor is selected and the date of the kickoff meeting.

- Public meetings and or public comment periods that have been planned or completed.
- Any other milestones that have been identified in the subapplication or agreed to or are required by the recipient.

B.4.2. BUDGET AND SCOPE OF WORK CHANGES

Recipients are required to report deviations from budget, project scope or objectives in accordance with Part 8. Recipients must request prior approvals from FEMA for budget and program plan revisions.[359]

B.5. Closeout

Recipients and subrecipients must closeout activities in a timely manner consistent with Part 9.

The recipient must provide a statement showing all the work in the approved scope of work and deliverables have been completed. This information can be included in the body of the closeout letter.

C. Technical Assistance (Financial and Non-Financial)

C.1. Overview

As described in Part 10, FEMA provides two types of technical assistance through HMA:

1. **FMA Technical Assistance Grant (Financial):** FMA Technical Assistance is a financial award made available to applicants to maintain a viable FMA program. For more information about the FMA Technical Assistance Grant, refer to the "Flood Mitigation Assistance Grant" webpage.
2. **BRIC Direct Technical Assistance (Non-Financial):** BRIC Direct Technical Assistance is non-financial support. For more information about BRIC Direct Technical Assistance, refer to the "Building Resilient Infrastructure and Communities" webpage.

C.2. Eligibility

C.2.1. ELIGIBLE ACTIVTIES

Technical assistance activities under FMA are those activities applicants need to complete to maintain a viable FMA program. Technical assistance activities under BRIC support communities that

[359] 2 CFR § 200.308

may not have the resources to begin planning and project solution design on their own. Refer to the relevant fiscal year NOFOs for more information.[360]

C.2.2. INELIGIBLE ACTIVITIES

A general list of ineligible activities is included in Part 4.

C.3. Application and Submission Information

All subapplications submitted to FEMA must meet the eligibility criteria in Part 4. All subapplications must have a scoping narrative in accordance with Part 6.

A technical assistance scope of work should include the following items:

- A description of the tasks needed to accomplish the proposed activity as well as any procurement that would be required.
- A description of how the proposed activity aligns with the current mitigation plan.
- The outreach and engagement plan (if applicable) and an account for the time and effort it may take to incorporate public and stakeholder feedback.
- The goals of the project scoping/advance assistance activity and specific deliverables.
- The steps the subapplicant will follow to complete the project scoping/advance assistance activity and proposed deliverables. The scope of work should identify a deliverable that includes required information to determine eligibility under HMA (e.g., engineering, cost-effectiveness and EHP data, cost estimate, project schedule, design plan or specifications).
- A description of the deliverables, tasks and schedule.

FEMA may request additional information after the subapplication has been submitted to ensure all necessary information is received. However, all information required by the regulations and the HMA Guide must be received before an assistance decision and award or final approval can be made.

C.3.1. ACTIVITY AND SCHEDULE

When submitting a subapplication to FEMA for technical assistance, a subapplication must identify the proposed use of the assistance, including costs and enough detail for both the proposed activity and milestones.

The scope of work narrative must describe the proposed activities and deliverables.

[360] According to Title 42 U.S.C. 4104c(c)(3)(J), to be eligible to receive this funding, the applicant must have received an FMA award of at least $1 million federal cost share funding in the prior fiscal year.

The schedule should include a list of milestones for each budget year. All deliverables must also be identified in the scope of work. The project schedule should note when deliverables are completed.

C.3.2. COSTS

C.3.2.1. Allowable Costs

Pre-award costs must be reasonable and identified in the budget to be considered eligible incurred costs. Refer to Part 3 for more information.

C.3.2.2. Unallowable Costs

The recipient must submit enough financial detail to demonstrate that no costs claimed under technical assistance are duplicated in other subapplications including those for management costs.

C.3.2.3. Budget

All subapplications must include a line-item breakdown of all anticipated costs while referencing the cost code categories on SF-424.

C.4. Subaward Implementation

Applicants and subapplicants must submit documentation to FEMA to support that they accomplished all activities listed in their technical assistance application.

C.4.1. PROGRAM REPORTING AND MONITORING

Post-award monitoring helps ensure that subapplicants/subrecipients are achieving the objectives of the federal award consistent with the performance goals and milestones described in the subaward.

To assist the recipient in monitoring partnership activities, the following milestone information or events (if appropriate) should be included in Quarterly Progress Reports:

- If the subrecipient is acquiring contract support, the subrecipient should report when the request for proposal is completed, when the contract is out for bid, when the bid period closes, when proposals are reviewed, when the contractor is selected and the date of the kickoff meeting.
- Public meetings and or public comment periods that have been planned or completed.
- Any other milestones that have been identified in the subapplication or agreed to or are required by the recipient.

C.4.2. BUDGET AND SCOPE OF WORK CHANGES

Recipients are required to report deviations from budget, project scope or objectives in accordance with Part 8. Recipients must request prior approvals from FEMA for budget and program plan revisions.[361]

In addition, prior approval from FEMA is required when a subrecipient wants to change the scope of work or the objective of the technical assistance activity (e.g., changes in key personnel managing the project, the level of effort, outreach activities or deliverables).

C.5. Closeout

Recipients and subrecipients must closeout activities in a timely manner consistent with Part 9.

The recipient must provide a statement showing that all work in the approved scope of work and deliverables have been completed. This information can be included in the body of the closeout letter.

D. Partnerships

D.1. Overview

Community resilience cannot be achieved without leveraging a broad network of partners that include (but are not limited to) all levels of government, the private sector, private nonprofits, and educational institutions.

These partners are key to driving investments in mitigation projects, building capability through training and technical assistance, planning for increased resilience, promoting mitigation activities and sharing information to promote and sustain a ready FEMA and prepared nation.

D.2. Eligibility

Certain partnership activities may be eligible for assistance under BRIC and FMA.

To ensure applicants and subapplicants can build partnerships to support their mitigation efforts, certain partnership activities may be eligible under the BRIC state/territory allocation and tribal set-aside and FMA capability- and capacity-building activities.

[361] 2 CFR § 200.308

D.2.1. ELIGIBLE ACTIVITIES

For specific eligibility criteria to receive assistance for partnership activities under BRIC, refer to the "Building Resilient Infrastructure and Communities" webpage and the NOFO for the year funding of the partnership activities was sought.

For specific eligibility criteria for partnership activities under FMA, refer to the "Flood Mitigation Assistance Grant" webpage and the NOFO for the year funding of the partnership activities was sought.

Generally, to receive assistance for partnership activities, applicants and subapplicants must demonstrate the effectiveness and ultimate benefit of the activities. Applicants demonstrate this by providing a detailed explanation of the proposed partnership activity, expected milestones and planned deliverables. At closeout, applicants and subapplicants must also provide information and materials to detail the outcomes of the approved activities and deliverables stated in the subapplication.

The following is a non-exhaustive list of potential partnership activities eligible under BRIC and FMA that enhance the knowledge, skills and expertise of applicants and subapplicants in developing and managing partnerships to build whole community resilience:

- Conducting a capability gap analysis (or partner network analysis) to determine where partnerships could be helpful or where assistance matching opportunities can be leveraged.
- Providing or attending training on evaluating, pursuing or sustaining partnerships.
- Supporting partner identification or partnership development activities (e.g., hosting a partner fair, pursuing initiatives with higher education institutions, engaging with economic development organizations), such as:
    - Involving private-sector and community lifelines operators, (i.e., health and medical, energy and transportation service providers) in the mitigation planning processes.
    - Developing a partner database or online portal to submit and share partnership case studies.
- Pursuing opportunities for knowledge transfer between partners (e.g., mentoring or shadowing programs), such as:
    - Attending state, local, tribal, territorial, regional or national conferences to support knowledge sharing and partnership development.
    - Hosting a forum to share best practices and lessons learned or conducting mitigation-related tabletop exercises to build relationships.
    - Sustaining existing partnership initiatives or capitalizing on existing networks.

- Implementing other innovative partnership approaches identified by the applicant or subapplicant to meet stated needs.

These activities may be pursued at the applicant or subapplicant level to support partnership building efforts or may be provided by applicants to subapplicants to enhance the capability of communities to develop and sustain partnerships.

D.2.2. INELIGIBLE ACTIVITIES

A general list of ineligible activities is included in Part 4.

D.3. Application and Submission Information

All subapplications submitted to FEMA must meet the eligibility criteria in Part 4. All subapplications must have a scoping narrative in accordance with Part 6.

FEMA may request additional information after the subapplication has been submitted to ensure that all necessary information is received. However, all information required by the regulations and the guidance must be received before an assistance decision and award or final approval can be made.

A partnership scope of work should include the following items:

- A description of the tasks needed to accomplish the proposed activity as well as any procurement that would be required.
- A description of how the proposed activity aligns with the current mitigation plan.
- The outreach and engagement plan (if applicable) and an account for the time and effort it may take to incorporate public and stakeholder feedback.
- The goals of the partnership activity and specific deliverables.
- The steps the subapplicant will follow to complete the partnership activity and proposed deliverables. The scope of work should identify a deliverable that includes required information to determine eligibility under HMA (e.g., engineering, cost-effectiveness and EHP data, cost estimate, project schedule, design plan or specifications).
- A description of the deliverables, tasks and schedule.

D.3.1. ACTIVITY AND SCHEDULE

When submitting a subapplication to FEMA for partnership activities, a subapplication must identify the proposed use of the assistance, including costs and enough detail for both the proposed activity and milestones.

The scope of work narrative must describe the proposed activities and deliverables.

The schedule should include a list of milestones for each budget year. All deliverables must also be identified in the scope of work. The project schedule should note when deliverables are to be completed.

D.3.2. COSTS

D.3.2.1. Allowable Costs

Pre-award costs must be reasonable and identified in the budget to be considered eligible incurred costs. Refer to Part 3 for more information.

D.3.2.2. Unallowable Costs

The recipient must submit enough financial detail to demonstrate that no costs claimed under partnerships are duplicated in other subapplications including those for management costs.

D.3.2.3. Budget

All subapplications must include a line-item breakdown of all anticipated costs while referencing the cost code categories on SF-424.

D.4. Subaward Implementation

Applicants and subapplicants must submit documentation to FEMA to support that they accomplished all activities listed in their partnership application.

D.4.1. PROGRAM REPORTING AND MONITORING

Post-award monitoring helps ensure that subapplicants/subrecipients are achieving the objectives of the federal award consistent with the performance goals and milestones described in the subaward.

To assist the recipient in monitoring partnership activities, the following milestone information or events (if appropriate) should be included in Quarterly Progress Reports:

- If the subrecipient is acquiring contract support, the subrecipient should report when the request for proposal is completed, when the contract is out for bid, when the bid period closes, when proposals are reviewed, when the contractor is selected and the date of the kickoff meeting.
- Public meetings and or public comment periods that have been planned or completed.
- Any other milestones that have been identified in the subapplication or agreed to or are required by the recipient.

D.4.2. BUDGET AND SCOPE OF WORK CHANGES

Recipients are required to report deviations from budget, project scope or objectives in accordance with Part 8. Recipients must request prior approvals from FEMA for budget and program plan revisions.[362]

In addition, prior approval from FEMA is required when a subrecipient wants to change the scope of work or the objective of the partnership activity (e.g., changes in key personnel managing the project, the level of effort, outreach activities or deliverables).

D.5. Closeout

Recipients and subrecipients must closeout activities in a timely manner consistent with Part 9.

The recipient must provide a statement showing that all the work in the approved scope of work and deliverables have been completed. This information can be included in the body of the closeout letter.

E. Codes and Standards

E.1. Overview

The development, adoption, evaluation, enhancement and enforcement of building codes and standards is a priority for HMA. Assistance for codes and standards-related activities can take place under three HMA programs: HMGP, HMGP Post Fire and BRIC. Eligible activities under these three programs are generally the same, but assistance restrictions (i.e., the ways in which these activities can be funded) differ.

The activities outlined below relate to both building codes and land use ordinances. Codes and standards activities help implement planning-related activities by focusing on where and how communities build in response to potential hazards. The phrase “codes and standards activities” can relate to codes and standards for buildings and structures as well as equivalent industry-accepted standards for non-building infrastructure projects.

Land use ordinances also can increase resilience by controlling the type and location of future building development. Under HMGP, HMGP Post Fire and BRIC, planning-related activities may allow for the evaluation, adoption and/or implementation of land use and development codes including but not limited to zoning codes, form-based codes, subdivision codes and floodplain management ordinances, that reduce risk and/or increase resilience to future hazards. For more information on eligible activities and funding restrictions, refer to Part 11.A.

[362] 2 CFR § 200.308

To promote code enforcement and improvement activities early in the recovery period, assistance may be available under HMGP and HMGP Post Fire for eligible codes and standards-related activities. This assistance can be applied for after receiving the 30-day and/or six-month HMGP assistance estimates. Refer to Part 10 for more information about available assistance amounts for HMGP and HMGP Post Fire and Part 3 for more information on coordinating with the PA Mitigation program.

E.2. Eligibility

E.2.1. ELIGIBLE ACTIVITIES

Under HMGP, HMGP Post Fire and BRIC, the types of codes and standards activities eligible for assistance include but are not limited to:

- Evaluation of the adoption and/or implementation of codes to reduce risk.
- Enhancement of existing adopted codes to incorporate more current requirements or higher standards.
- Development of professional workforce capabilities through technical assistance and training with the use of tools such as available e-permitting software, remote, virtual and drone inspection technologies.
- Evaluation of the adoption and/or implementation of land use and zoning ordinances.

Potential eligible costs for codes and standards activities include the following:

- Labor costs for activities such as staff review of building codes, development of ordinances, drafting of procedures for plan review and inspection, and training and certification in latest codes not covered by normal staffing costs, such as overtime.
- Service contracts (e.g., architect/engineering consulting services to support projects related to building codes).
- Materials (e.g., purchase of code books or manuals and printing of publications supporting building code projects).
- Other costs (e.g., costs related to implementation, raising awareness, disseminating information and providing education related to new or upgraded codes).

Part-time or other staff hired to address a surge in permitting activities because of the disaster are eligible expenses.

Additionally, HMGP and HMGP Post Fire provide assistance for post-disaster code enforcement, which is a recovery activity. Post-disaster code enforcement activities are not eligible under BRIC. Codes and standards activities are not eligible under FMA.

Code-related matters are dealt with differently across state, local, tribal and territorial governments. FEMA recommends that appropriate state, local, tribal or territorial government hazard mitigation officers coordinate with their respective counterparts in building safety and/or code enforcement when pursuing eligible activities under HMA.

Table 15 highlights eligible codes and standards activities.

Table 15: Eligible Codes and Standards Activities

Eligible Activities	HMGP	HMGP Post Fire	BRIC	FMA
Evaluation of the adoption and/or implementation of codes that reduce risk	Yes	Yes	Yes	No
Enhancement of existing adopted codes to incorporate more current requirements or higher standards	Yes	Yes	Yes	No
Development of professional workforce capabilities through technical assistance and training	Yes	Yes	Yes	No
Evaluation of the adoption and/or implementation of land use and zoning ordinances	Yes	Yes	Yes	No
Post-disaster code enforcement	Yes	Yes	No	No

E.2.1.1. Evaluation, Enhancement and Development Activities

Eligible codes and standards activities under HMGP, HMGP Post Fire and BRIC include assistance for the following activities:

- Evaluate which code adoption and enforcement activities are best suited for the jurisdiction. Activities include the publication of code requirements related to land use, zoning, floodplain management, infrastructure, urban-wildland defensible space (e.g., stormwater management regulations) or other areas that help make a community more resilient.
- Enhance (e.g., adopt, develop, improve or modify) current or existing building code requirements to reflect the latest code edition, exceed the latest code edition or develop/modify building code-coordinated requirements.
- Develop professional workforce capabilities through technical assistance and training for the public and/or private sectors.

- Training activities include:
  - Providing or pursuing training, including individual certification courses (e.g., inspector, plans reviewer, certified floodplain manager).
  - Planning, training and exercises for post-disaster building code enforcement.
  - Developing activities related to improving code enforcement (e.g., evaluate processes; implement an inspection program; improve the Insurance Office Services, Inc.'s Building Code Effectiveness Grading Scale score; and improve the Community Rating System rating).
- Technical assistance activities include:
  - Employing a mutual-aid agreement among communities to use other local building officials.
  - Entering into a contractual agreement with a state or regional government entity that is knowledgeable of building codes and proper administration of a building department.
  - Entering into a contractual agreement with one of the model building code organizations.
  - Employing building code experts temporarily.
  - Requesting FEMA technical assistance regarding building codes and proper building department administration.

Table 16 highlights eligible evaluation, enhancement and development codes and standards activities. These activities are subject to funding restrictions. Refer to Part 11.E.2.4 and Part 10 for additional information.

Table 16: Eligible Activities to Evaluate the Adoption and/or Implementation of Codes and Standards Activities

Activity	Eligibility			
	HMGP and HMGP Post Fire *5 Percent Initiative*	HMGP and HMGP Post Fire *5 Percent Codes and Standards*	HMGP and HMGP Post Fire *7 Percent Planning*	BRIC
Evaluate which code adoption and enforcement activities are best suited for the jurisdiction	Yes	Yes	Yes, land use ordinances only	Yes

Activity	Eligibility			
	HMGP and HMGP Post Fire *5 Percent Initiative*	HMGP and HMGP Post Fire *5 Percent Codes and Standards*	HMGP and HMGP Post Fire *7 Percent Planning*	BRIC
Adopt building codes or develop building code requirements that help make the community more resilient (including publication of those requirements) related to land use, zoning, floodplain management, infrastructure, urban-wildland defensible space (e.g., building, stormwater management regulations) or other area	Yes	Yes	Yes, land use ordinances only	Yes
Improve or modify current or existing building code requirements to reflect the latest code edition, exceed the latest code edition, or develop or modify building code-coordinated requirements that help make the community more resilient (including publication of those requirements) related to land use, zoning, floodplain management, infrastructure, urban-wildland defensible space (e.g., stormwater management regulations) or other area	Yes	Yes	Yes, land use ordinances only	Yes
Enhance existing adopted codes and enforcement to incorporate more current requirements, higher standards, electronic permitting, online model code access, virtual inspection technology and remote building codes administration	Yes	Yes	No	Yes
Provide or pursue training, including individual certification courses (inspector, plans reviewer, certified floodplain manager) and training for both the public and private sectors	Yes	Yes	Yes, when in support of an eligible planning activity	Yes
Develop planning, training and exercises for post-disaster building code enforcement	Yes	Yes	Yes	Yes

Activity	Eligibility			
	HMGP and HMGP Post Fire *5 Percent Initiative*	HMGP and HMGP Post Fire *5 Percent Codes and Standards*	HMGP and HMGP Post Fire *7 Percent Planning*	BRIC
Develop or acquire software, hardware and associated training to assist with plan reviews, permitting, inspections and records retention	Yes, when in support of other eligible activities	Yes, when in support of other eligible activities	No	Yes
Purchase publications—obtain digital license or printing permissions of publications—to support building code activities	Yes	Yes	No	Yes
Engage consulting services to support activities related to building codes	Yes	Yes	No	Yes
Engage consulting services to support activities related to land use ordinances	Yes	Yes	Yes	Yes
Cover costs associated with building department accreditation	Yes	Yes	No	Yes
Conduct public awareness activities and outreach related to building codes	Yes	Yes	No	Yes
Conduct public awareness activities and outreach related to land use ordinances	Yes	Yes	Yes	Yes
Develop activities related to improving code enforcement (evaluate processes, implement an inspection program, improve Building Code Effectiveness Grading Scale score, improve CRS rating)	Yes	Yes	Yes, for CRS rating only	Yes

If a property owner needs additional design assistance to complete the permitting process, project scoping/advance assistance may be used.

E.2.1.2. HMGP and HMGP Post Fire Post-Disaster Code Enforcement

HMGP and HMGP Post Fire may provide assistance for code enforcement after a disaster to ensure that disaster-resistant building codes (codes, standards and local ordinances that promote disaster resistance) are adopted and implemented. Eligible costs are "extraordinary" post-disaster code enforcement costs or the costs that exceed the building department's normal costs. The best time for local communities to enforce post-disaster codes is during response and recovery. Subapplicants

may apply for post-disaster code enforcement activities once the HMGP or HMGP Post Fire application period has been opened.

As part of PA, FEMA is also authorized to provide assistance to state and local governments for building code and floodplain administration and enforcement, including inspections for substantial damage compliance, for a period of not more than 180 days after the major disaster is declared. HMGP can provide assistance for post-disaster building code activities to continue past the 180-day PA limit. If a recipient or subrecipient receives PA assistance for building code enforcement and administration activities and intends to continue these activities after PA is no longer available, they should submit a subapplication under HMGP as soon as possible so the subapplication can be reviewed and approved before PA expires. More information can be found in FEMA Policy #204-079-01, *Building Code and Floodplain Management Administration and Enforcement* (Oct. 15, 2020).

Table 17 highlights eligible post-disaster code enforcement and recovery activities.

Table 17: Eligible Post-Disaster Code Enforcement and Recovery Activities

Activity	Eligibility			
	HMGP and HMGP Post Fire 5 Percent Initiative	HMGP and HMGP Post Fire 5 Percent Codes and Standards	HMGP and HMGP Post Fire 7 Percent Planning	BRIC
Conduct post-disaster code enforcement activities	Yes	Yes	No	No
Track and enforce disaster-damaged properties (including substantially damaged structures) to ensure they are repaired to appropriate building codes and flood management standards	Yes	Yes	No	No
Provide technical assistance to property owners during repairs of disaster-damaged structures (including substantially damaged structures)	Yes	Yes	No	No

E.2.2. INELIGIBLE ACTIVITIES

A general list of ineligible activities is included in Part 4.

Codes and standards activities cannot result in adoption or enforcement of requirements that are weaker than consensus-based codes and standards. The jurisdiction's normal staffing costs are not eligible under HMGP, HMGP Post Fire or BRIC. Costs covered by other federal assistance programs (e.g., PA) are not eligible.

E.2.3. PROGRAM INCOME

If this project type will include processing permit applications and communities receive fees for those permit applications, then the subapplicant needs to consider how this support is above and beyond what is supposed to be covered by permit fees. Fee waivers are considered program income. For more information on program income, refer to Part 8.

E.2.4. ASSISTANCE RESTRICTIONS

Assistance restrictions for HMGP, HMGP Post Fire and BRIC are described below.

E.2.4.1. HMGP and HMGP Post Fire Assistance Funding Restrictions for Codes and Standards

Codes and standards projects may be funded via multiple assistance opportunities under HMGP and HMGP Post Fire:

- **5 Percent Initiative**: Up to 5% of the HMGP ceiling amount or HMGP Post Fire available assistance amount may be set aside by the recipient to pay for activities for which it is difficult to quantify cost-effectiveness. Applicants may apply for 5% of the HMGP ceiling amount or HMGP Post Fire available assistance amount for codes and standards activities under the 5 Percent Initiative, in addition to the 5 Percent Codes and Standards funding mentioned immediately below. Applicants may use this funding opportunity if the 5 Percent Initiative assistance is not used for other activities. Codes and standards activities are just one type of eligible activity under the 5 Percent Initiative.

- **5 Percent Codes and Standards**: Applicants may apply for up to 5% of the HMGP ceiling amount or HMGP Post Fire available assistance amount for codes and standards activities. This funding source was previously referred to as "Additional 5 Percent Initiative." The name and requirements have been updated to provide dedicated funding to strengthen the use of building codes and standards. The 5 Percent Codes and Standards offers eligibility for a variety of codes and standards activities. This funding source must be used for codes and standards activities and may be paired with the 5 Percent Initiative for a total of up to 10% of the HMGP ceiling amount or HMGP Post Fire available assistance amount.

- **Other federal funding**: Any codes and standards activities funded by another federal program are not eligible for assistance under HMGP or HMGP Post Fire. For example, codes and standards activities funded under PA cannot also be funded under HMGP or HMGP Post Fire. Once the available PA support has been exhausted, codes and standards activities can then be continued under HMGP and HMGP Post Fire.

E.2.4.2. BRIC Funding for Codes and Standards

Assistance for codes and standards activities under BRIC are described in detail in the yearly NOFO. Codes and standards activities are only eligible for assistance under the state/territory allocation and tribal set-aside; they are not eligible for assistance under the national competition.

E.2.5. COST-EFFECTIVENESS

Subapplications for codes and standards activities under HMGP, HMGP Post Fire and BRIC are not required to perform a BCA if the assistance amounts are within the restrictions noted above for HMGP, HMGP Post Fire or within the limitations set forth in the relevant BRIC NOFO.

E.3. Application and Submission Information

All subapplications submitted to FEMA must meet the eligibility criteria in Part 4. All subapplications must have a scoping narrative in accordance with Part 6. Specific criteria for codes and standards subapplications are highlighted below.

- A description of how the proposed activity aligns with the current mitigation plan.
- The outreach and engagement plan (if applicable) and an account for the time and effort it may take to incorporate public and stakeholder feedback.
- The goals of the codes and standards activity and specific deliverables.
- The steps the subapplicant will follow to complete the codes and standards activity and proposed deliverables.
- A description of the deliverables, tasks and schedule.

FEMA may request additional information after the subapplication has been submitted to ensure all necessary information is received. However, all information required by the regulations and the guidance must be received before an assistance decision and award or final approval can be made.

E.3.1. ACTIVITIES AND SCHEDULE

All subapplications, as part of the scope of work, should include an activities description referencing industry standards or project plans and specifications. The subapplication needs to describe the deliverable for the proposed activity and include a schedule for completing the activities.

Development of the Activities Description: The activities description explains how a subapplicant will organize and execute the related activity. Generally, the description explains the activities that will be completed and identifies the deliverable product. The subapplicant should identify whether the subapplication expects to use contract support, identifies stakeholders or explains public outreach.

An activities description should address the following:

- **Tasks**: The subapplicant must describe the tasks needed to accomplish the proposed activity as well as any required procurement.

- **Alignment with current mitigation plans**: The scope of work must describe how the proposed activity builds on activities in the current approved mitigation plan or describe how this information will be incorporated into the next update of the plan.
- **Conformance with NFIP**: The scope of work must indicate that the proposed codes and standards deliverables will comply with NFIP requirements. The scope of work must include an assessment of the deliverables by the NFIP state or tribal coordinator to determine if the deliverables are compliant with NFIP regulations.
- **Public and stakeholder engagement plan**: The scope of work must identify the outreach and engagement plan. The activity description should account for the time and effort it may take to incorporate public and stakeholder feedback.
- **Codes and standards assessment and adoption**: The scope of work must describe the codes and standards assessment and drafting process, adoption by the subrecipient/participant jurisdictions and final approval by the recipient, as applicable.
- **Goals**: The scope of work must include the goals of the related codes and standards activity and identify specific deliverables that will be completed by the activity.
- **Training and exercises**: The scope of work must describe any proposed training and exercise activity and identify how it will support the ability and capacity building of personnel.
- **Equipment and publications**: The scope of work must describe the proposed acquisition of software and hardware, if applicable, and the intention to purchase building code publications or subscriptions.
- **Implementation strategy**: The scope of work must outline the steps the subapplicant will follow to implement the codes and standards activity and complete the proposed deliverables. This information should include a project schedule.

E.3.2. COSTS

E.3.2.1. Allowable Costs

Pre-award costs must be identified in the budget to be considered eligible incurred costs.

E.3.2.2. Unallowable Costs

The recipient must submit enough financial detail to demonstrate that no costs claimed under technical assistance are duplicated in other subapplications including those for management costs. Costs covered by other federal assistance programs (e.g., PA) are not allowable.

E.3.2.3. Budget

All subapplications must include a line-item breakdown of all anticipated costs while referencing the cost code categories on SF-424.

E.4. Subaward Implementation

Applicants and subapplicants must submit documentation to FEMA to support that they accomplished all activities listed in their partnership application.

E.4.1. PROGRAM REPORTING AND MONITORING

Post-award monitoring helps ensure subapplicants/subrecipients are achieving the objectives of the federal award consistent with the performance goals and milestones described in the subaward.

To assist the recipient in monitoring codes and standards activities, the following milestone information or events (if appropriate) should be included in Quarterly Progress Reports:

- If the subrecipient is acquiring contract support, the subrecipient should report when the request for proposal is completed, when the contract is out for bid, when the bid period closes, when proposals are reviewed, when the contractor is selected and the date of the kickoff meeting.
- Public meetings and or public comment periods that have been planned or completed.
- Training or exercises that have been scheduled and completed.
- When the subapplicant has adopted the code or standard, if adoption is delayed or if the subapplicant does not intend to adopt the code or standard.
- Any other milestones that have been identified in the subapplication, agreed to, or are required by the recipient.

E.4.2. BUDGET AND SCOPE OF WORK CHANGES

Recipients are required to report deviations from budget, project scope or objectives in accordance with Part 8. Recipients must request prior approvals from FEMA for budget and program plan revisions.[363]

In addition, prior approval from FEMA is required for the following:

[363] 2 CFR § 200.308

- When a subrecipient wants to change the scope of work or the objective of the codes or standards activity (e.g., changes in key personnel managing the project, the level of effort, outreach activities or deliverables).
- When the subrecipient/jurisdiction chooses not to adopt the code or standard as described in the scope of work.

E.5. Closeout

Recipients and subrecipients must closeout activities in a timely manner consistent with Part 9.

The recipient must provide a statement showing that all work in the approved scope of work including the proposed deliverables and tasks was completed. This information can be included in the body of the closeout letter.

If the scope of work included adoption of a code or standard, the recipient must provide documentation to demonstrate the code or standard was adopted by the subapplicant/participating jurisdictions. In addition, the closeout statement should include documentation that the state or tribal NFIP coordinator has determined the codes and standards are compliant with NFIP regulations, if applicable. The subrecipient must also provide a brief description of lessons learned or success stories.

Codes and Standards Resources

- *Reducing Flood Losses Through the International Codes: Coordinating Building Codes and Floodplain Management Regulations, 5th Edition* (2019): https://www.fema.gov/sites/default/files/2020-07/fema_reducing_flood_losses_rfl_5th-ed.pdf
- International Building Code: https://www.iccsafe.org/products-and-services/i-codes/2018-i-codes/ibc/
- International Residential Code: https://www.iccsafe.org/products-and-services/i-codes/2018-i-codes/irc/
- American Society of Civil Engineers/Structural Engineering Institute 7: https://www.asce.org/asce-7/
- American Society of Civil Engineers 24: https://ascelibrary.org/doi/book/10.1061/asce24
- BRIC Building Code Activities: https://www.fema.gov/sites/default/files/2020-08/fema_bric-building-code-activities_support_document_august_2020.pdf
- FEMA Building Science: https://www.fema.gov/emergency-managers/risk-management/building-science

- International Code Council 500: https://shop.iccsafe.org/icc-500-2014-standard-and-commentary-icc-nssa-standard-for-the-design-and-construction-of-storm-shelters-1.html
- FEMA Policy 2014-079-01, *Building Code and Floodplain Management Administration and Enforcement*: https://www.fema.gov/sites/default/files/2020-10/fema_building-dode-floodplain-management-ddministration-enforcement-policy_drra-1206_signed_10-15-2020.pdf

Part 12. Mitigation Projects

This section provides guidance on common project types that are generally eligible for Hazard Mitigation Assistance (HMA). Each project-specific section in this part generally follows the same outline by first providing an overview of the project type, followed by eligibility criteria and a description of eligible activities, application and submission information, subaward implementation, closeout and additional resources. To be eligible for HMA, all mitigation projects must meet the general eligibility criteria and other requirements described in Part 4.

Natural hazards such as flooding, high wind, extreme temperatures, drought, earthquakes, wildfires and landslides pose major threats to communities across the United States. Reducing these threats to lives, properties and the economy is a top priority for the Federal Emergency Management Agency (FEMA) and many communities. Where appropriate, FEMA encourages evaluating nature-based solutions as a cost-effective and climate-resilient approach to keep natural hazards from becoming more costly disasters. For example, the *National Mitigation Investment Strategy* has recognized the many benefits nature-based solutions can offer and the diverse partners they can draw to the table. Therefore, as an overarching philosophy to hazard mitigation, this part's first section provides additional information on nature-based solutions.

A. Overarching Philosophy: Undertaking Mitigation with Nature-Based Solution Techniques

Nature-based solutions are sustainable planning, design, environmental management and engineering practices that weave natural features or processes into the built environment to build resilient communities and mitigate the impact of climate change. FEMA uses the term "nature-based solutions" to refer to an umbrella of strategies, including green infrastructure, bioengineering, and/or natural infrastructure. Other agencies may also use the terms "natural or nature-based features" or "engineering with nature," which all fall under the term "nature-based solutions" in the HMA Guide.

Nature-based solutions can help reduce the loss of life and property, strengthening resilience against the nation's most common natural hazards.

These include, but are not limited to:

- Coastal flooding and storm surge
- Extreme temperatures
- Drought
- Landslides
- Riverine flooding

- Urban flooding
- Coastal flooding and storm surge
- Extreme temperatures
- Landslides
- Wildfire

In addition, nature-based solutions can provide short- and long-term environmental, economic and social co-benefits that improve a community's quality of life and make it attractive to new residents and businesses. A single nature-based project can yield various community benefits that fulfill many goals. Co-benefits can include improved water and air quality, healthier wildlife habitats, economic growth, cooler summer temperatures and shade cover, recreational space, and other benefits that support community well-being. FEMA's HMA programs support incorporating nature-based solutions into all eligible projects. Nature-based solutions may be categorized by different scales, types, and locations, which are discussed in more detail below. Projects using nature-based solutions will need to meet all HMA eligibility criteria (as described in Part 4), including providing risk reduction benefits, demonstrating cost-effectiveness, and meeting environmental and historic preservation (EHP) and floodplain management requirements.

A.1. Types of Nature-Based Solutions

Nature-based solutions can vary based on scale, location and type of hazard. Nature-based solutions can be applied to small or localized projects at a neighborhood or site scale, larger community projects up to a watershed or landscape scale, or to projects that protect coastal areas. Nature-based solutions can be implemented in many different ecosystems to address different hazard types. The list below identifies some examples of nature-based solutions at different scales for different hazard types. For more examples and information on nature-based solutions, see Building Community Resilience with Nature-Based Solutions.

- **Neighborhood or site scale**: These smaller approaches are adapted to provide localized, site-specific mitigation within the existing built environment. These nature-based solutions can often be built into a site, corridor or neighborhood without requiring additional space and can be combined with larger mitigation projects. Projects at this scale can mitigate a variety of natural hazards. Example approaches include, but are not limited to:
    - Wildfire: Creation of defensible space using native and/or fire-resistant vegetation, post-fire soil stabilization using earthen materials and native and/or fire-resistant vegetation.
    - Drought: Replacing existing vegetation with drought-tolerant vegetation (xeriscaping), clearing invasive plants that use more water than native species.

- Extreme Temperatures (Heat): Green roofs, increasing the tree canopy, adding urban trees in strategic locations such as around buildings and/or shading pavement, urban forests, green streets.

- Stormwater/urban flooding: Green roofs, rain gardens, bioswales, urban trees and forests, constructed wetlands.

- Flooding and Erosion: Property acquisition and structure demolition/relocation projects that deed-restrict the property for green open space, low-impact development on scale of entire site or project, riparian buffers, greenways, waterfront parks, geotextiles, stabilizing sod, vegetative buffer strips, preservation of mature vegetation, decreasing slope angles, permeable pavement

- **Watershed or landscape scale**: These approaches consist of interconnected systems of natural areas and open space. These are large-scale approaches that require long-term planning and coordination, as these projects can affect multiple jurisdictions and fall into the purview of more than one government agency. Examples of different approaches include, but are not limited to:

  - Wildfire: Natural wildlife buffer zone that uses earthen materials and native and/or fire-resistant vegetation; ecological forest management/fuel reduction that addresses wildfire mitigation and includes restoration to natural conditions; greenbelts of diverse vegetation including trees, shrubs, grasses and wildflowers, ideally native to the area, that act as natural buffers to create separation from wildlands

  - Drought: Aquifer recharge, improved storage and recovery, floodplain and stream restoration, and improved surface infiltration.

  - Flooding and erosion: Floodplain reconnection and restoration; bank stabilization that mimics the natural channel and/or improves natural conditions or uses natural structures; floodplain and stream restoration to return natural flows to a riverine system.

- **Coastal areas**: These approaches are nature-based solutions that stabilize or protect the shoreline, reducing erosion and buffering the coast from storm impacts. While many watershed and neighborhood-scale solutions work in coastal areas, these systems are specifically designed to support coastal resilience. Example approaches include, but are not limited to:

  - Living shorelines, dune restoration or stabilization, reef restoration, creation or expansion of mangroves, wetlands, freshwater marshes, and/or salt marshes.

A.2. Spectrum of Nature-Based Solutions

Nature-based solutions are not a one-size fits all approach to hazard mitigation. Instead, these approaches can be adapted to meet the mitigation needs of the community. Nature-based solutions incorporate natural features and processes to provide a similar level of protection achieved by traditional engineered infrastructure or "gray infrastructure" (such as seawalls, water treatments plants, pipes, and dams, etc.).

Nature-based solutions can be stand-alone mitigation projects that do not include traditional or gray infrastructure measures. These projects rely entirely on natural features or processes to achieve risk reduction. Floodplain and wetland restoration projects are stand-alone nature-based solutions that can reduce flood risk at the landscape or watershed scale. Xeriscaping and rain gardens are also examples of nature-based solutions that provide risk reduction without gray infrastructure.

Applicants can also take a hybrid approach by incorporating nature-based solutions within traditional mitigation projects or develop a stand-alone nature-based solutions mitigation project. Hybrid methods are a combination of engineered or gray infrastructure and nature-based solutions. Examples of hybrid measures include, but are not limited to, marsh-levee system or dune-dyke systems, living seawalls, green ripraps, and artificial reefs. In addition, there are instances where hard features can be 'softened' through vegetation or similar nature-based features. Including elements of nature-based solutions in a traditional mitigation project can increase effectiveness, while also providing environmental, economic and/or social co-benefits.

Depending on the type of project, desired risk reduction, and available resources, the level of nature-based solutions in a mitigation project will vary. Nature-based solutions are still novel for many communities and may provide an opportunity to incorporate innovation into more traditional risk reduction projects. FEMA encourages communities to incorporate nature-based solutions in mitigation projects to reduce risk to natural hazards and climate change, support economic development, improve quality of life in communities and provide environmental benefits.

Nature-Based Solutions Resources

- FEMA Nature-Based Solutions: www.fema.gov/emergency-managers/risk-management/nature-based-solutions
- FEMA Building Community Resilience with Nature-Based Solutions - A Guide for Local Officials: www.fema.gov/sites/default/files/documents/fema_riskmap-nature-based-solutions-guide_2021.pdf
- White House Opportunities to Accelerate Nature-Based Solutions - A Roadmap for Climate Progress, Thriving Nature, Equity & Prosperity: www.whitehouse.gov/wp-content/uploads/2022/11/Nature-Based-Solutions-Roadmap.pdf

- White House Nature-Based Solutions Resource Guide - Compendium of Federal Examples, Guidance, Resource Documents, Tools, and Technical Assistance: www.whitehouse.gov/wp-content/uploads/2022/11/Nature-Based-Solutions-Resource-Guide-2022.pdf
- Environmental Protection Agency Green Infrastructure: https://www.epa.gov/green-infrastructure
- National Oceanic and Atmospheric Administration Office for Coastal Management Digital Coast – *Nature-Based Solutions for Coastal Hazards* course: https://coast.noaa.gov/digitalcoast/training/green.html
- The Nature Conservancy Promoting Nature-Based Hazard Mitigation through FEMA Mitigation Grants: www.nature.org/content/dam/tnc/nature/en/documents/Promoting-Nature-Based-Hazard-Mitigation-Through-FEMA-Mitigation-Grants-05-10-2021-LR.pdf
- Coral Reef Restoration for Risk Reduction (CR4): A guide to Project Design and Proposal Development: https://www.coralreef.gov/assets/about/cr4_guide_nov2022_508.pdf

B. Project Types

The following sections highlight common HMA project types. For additional examples of HMA project activities, refer to the FEMA *Mitigation Action Portfolio* (Aug. 2020).

B.1. Property Acquisition for Open Space

B.1.1. PROPERTY ACQUISITION: OVERVIEW

Generally, FEMA-assisted property acquisition projects consist of a community purchasing at-risk structures from voluntary sellers and either demolishing the structures or relocating the structures to a new site outside of the hazard-prone area. The purchased property is then maintained, in perpetuity, for open-space purposes and to restore or conserve the site's natural functions.

FEMA generally encourages communities to opt for the acquisition and structure demolition model. These projects are simpler because they typically require minimal EHP review, are considerably less expensive and allow homeowners to determine where to relocate.

Property acquisition and structure relocation typically involve the acquisition of land and the physical relocation of an existing structure on that land to an area outside of a hazard-prone area, such as outside of the Special Flood Hazard Area (SFHA) or a regulatory erosion zone. Relocation must conform to all applicable state and local regulations.

Properties acquired with FEMA assistance in structure demolition or relocation projects must be dedicated and maintained in perpetuity as compatible with open space for the conservation of natural floodplain functions.[364] These compatible open space uses may include parks for outdoor recreational activities, wetlands management and natural reserves, cultivation, grazing, camping (with some safety-related exceptions) and unimproved, unpaved parking lots. The regulation also authorized FEMA to allow other uses the agency determines are compatible with open space because these uses conserve the natural floodplain function.[365]

Establishing and maintaining open space uses in perpetuity is accomplished by recording deed restrictions consistent with the *FEMA Model Deed Restriction*. Recipients and subrecipients are responsible for oversight in ensuring and enforcing proper land use and coordinating with and gaining approval from FEMA on any future land use change or property disposition issues.[366] FEMA must review and approve the proposed land use of all property acquired for open space purposes unless the use is grading and seeding of the former building site.[367]

No new structures will be built on the property, except:[368]

[364] 44 CFR § 80
[365] 44 Code of Federal Regulations (CFR) § 80.19(a)
[366] 44 CFR § 80.19(a)
[367] Under 44 CFR § 80.5(a)(4), FEMA is responsible for "making determinations on the compatibility of proposed uses with the open space purpose, in accordance with 44 CFR § 80.19." FEMA determined that grading and seeding is generally not a separate use; rather, grading and seeding of the building site is a necessary and reasonable part of a demolition.
[368] 44 CFR § 80.19(a)(2)

- Public buildings that are open on all sides and functionally related to a designated open space or recreational use.
- Public restrooms.
- Structures that are compatible with open space, recreational or wetlands management use and applicable floodplain management policies and practices, and for which compatibility is confirmed in writing by the FEMA regional administrator before construction of the structures begins.
- Structures described in the above three bullets that will be elevated or floodproofed to the Base Flood Elevation plus one foot of freeboard and that meet the applicable requirements of the National Flood Insurance Program (NFIP) floodplain management regulations in 44 Code of Federal Regulations (CFR) § 60.3.[369]

B.1.2. PROPERTY ACQUISITION: ELIGIBILITY

To receive assistance for property acquisition and structure demolition or relocation projects that create open space, applicants and subapplicants must meet the regulatory requirements in 44 CFR Part 80 and the criteria outlined below and in Part 4. A project may not be framed in a manner that has the effect of circumventing these requirements.[370]

B.1.2.1. Eligibility Criteria

For a property to be eligible for FEMA-assisted acquisition, the subapplicant must acquire the full fee title of the property (except for any easements and encumbrances that FEMA determines are compatible with open space) from a willing, voluntary seller, or must retain such interest.[371] The subapplicant must commit not to use eminent domain if the property owner chooses not to participate and must verify that the property is not needed as part of another intended or planned HMA project.[372] Once assistance has been awarded for the project, a property may not be subdivided before it is acquired except for portions outside the SFHA or any risk zone identified by FEMA.[373]

Subrecipients must apply deed-restriction language to all acquired properties to ensure the property is maintained in perpetuity as open space consistent with natural floodplain functions, as agreed to by accepting FEMA mitigation award assistance.[374] Deed restriction language is applied to acquired properties by recording the open space and deed restrictions. Modifications to the language in the

369 44 CFR § 80.19(a)(3)
370 44 CFR § 80.7
371 44 CFR § 80.11(d)
372 44 CFR § 80.11(a); 44 CFR § 80.13(a)(5)
373 44 CFR § 80.11(c)
374 44 CFR § 80.11(f)

Model Deed Restriction can only be made with prior approval from the FEMA Office of Chief Counsel through the appropriate FEMA regional office.

A property is eligible for acquisition if it meets all the following requirements:

- FEMA approves the proposed land use of all property acquired for open space purposes, unless the use is limited to grading and seeding of the former building site (FEMA has determined that grading and seeding is generally not a separate use; rather grading and seeding of the building site is necessary and reasonable part of a demolition. Additional approval is not required if the activity is limited to grading and seeding of the former building site).
    - FEMA must review each request to determine if the proposal is compatible with the purpose of open space as stated in regulation and consistent with the deed restrictions, grant agreements, the HMA Guide or most current edition, and floodplain management requirements.[375]
    - FEMA reviews open space land use either when it reviews a subapplication for acquisition of land for open space or once the acquisition is completed, if the subrecipient proposes a change in land-use post-acquisition.
- It will be acquired from a willing, voluntary seller.
    - The owner of the acquired property must voluntarily agree to sell the land.[376] During the development of an acquisition project for open space, property owners are responsible for notifying the subapplicant of their interest in participating in the proposed project. They must provide all information requested by the subapplicant and complete all actions that are required to complete the subapplication and to implement the property acquisition and structure demolition or relocation.[377]
- It contains an at-risk structure that may or may not have been damaged or destroyed because of a hazard event. In certain circumstances, undeveloped, flood-prone or at-risk land that is part of a project with an adjacent eligible property with one or more existing structure(s), and the total project remains cost-effective, may also be eligible.[378]
- The subapplicant acquires or retains fee title, except for encumbrances FEMA determines are compatible with open space uses, as part of the project implementation.[379]

[375] 44 CFR § 80.5(a)
[376] 44 CFR § 80.11(a)
[377] 44 CFR § 80.5(d)
[378] 44 CFR § 80.11(b).
[379] 44 CFR § 80.11(d)

- It is not contaminated with hazardous materials at the time of acquisition other than incidental demolition or household waste.[380]

    - It is not part of an intended, planned or designated project area for which the land is to be acquired by a certain date and/or where there is an intention to use the property for any public or private use that is inconsistent with the open space deed restrictions and FEMA acquisition requirements (e.g., roads, flood risk reduction levees). The property acquired or from which a structure is removed must be dedicated as open space in perpetuity consistent with the regulations in 44 CFR Part 80.[381]

Other eligibility requirements are as follows:

- In accordance with the Coastal Barrier Resources Act of 1982,[382] HMA programs may assist projects in Otherwise Protected Areas if they do not require flood insurance after project completion.[383] Acquisitions in a John H. Chafee Coastal Barrier Resources System (CBRS) unit are eligible only if they qualify for one of the exceptions in Section 6 of the Coastal Barrier Resources Act.[384] That is, acquisitions are eligible if they are consistent with the purposes of the Coastal Barrier Resources Act and qualify as projects for the study, management, protection and enhancement of fish and wildlife resources and habitats.[385]

    - All projects that occur in or adjacent to CBRS units must meet one of the Coastal Barrier Resources Act exceptions and require that FEMA consult with the appropriate U.S. Fish and Wildlife Service Ecological Services field office.

    - Proposed actions carried out within or adjacent to an Otherwise Protected Areas do not require consultation with Fish and Wildlife Service.

- Any structure that is relocated must be placed outside the SFHA and outside any regulatory erosion zone or other mapped hazard area, and the relocation must conform to any other applicable state or local land use regulations.

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[380] 44 CFR § 80.11(e)
[381] 44 CFR § 80.11(f)
[382] Public Law 97-348 (Oct. 18, 1982), as amended. To remove federal incentives to develop coastal areas, the Coastal Barrier Resources Act designated relatively undeveloped land along the Atlantic and Gulf Coast as part of the John H. Chafee Coastal Barrier Resources System (CBRS) and made these areas ineligible for most new federal assistance.
[383] Congress reauthorized the Coastal Barrier Resources Act with the Coastal Barrier Improvement Act of 1990 (Public Law 101-591 [Nov. 16, 1990], expanding the CBRS to include undeveloped costal barriers along the Keys, Great Lakes, Puerto Rico and the U.S. Virgin Islands. It also added a new category of undeveloped barriers called Otherwise Protected Areas. Otherwise Protected Areas consist of conservation or recreation areas such as national wildlife refuges, state and national parks, local conservation areas, and private conservation areas, although they may also contain private areas not for conservation.
[384] 16 United States Code (U.S.C.) § 3505
[385] 16 U.S.C. § 3505(a)(6)(A), 44 CFR § 206.345

B.1.2.2. Eligible Activities

Eligible activities include property acquisition and structure demolition, as well as property acquisition and structure relocation. These activities are eligible under HMGP, HMGP Post Fire, BRIC and FMA; however, for purposes of Flood Mitigation Assistance (FMA), only property acquisition and structure demolition or relocation based on flooding is eligible.[386]

The following sections outline special considerations.

B.1.2.2.1. Pre-Award Demolition Activities

FEMA's regulation on eligible costs for acquisitions states that the agency may assist eligible pre-award costs at its discretion as assistance is available.[387] Recipients and subrecipients may be reimbursed for eligible pre-award costs for activities directly related to the project proposal's development. Demolition, construction and ground disturbing activities that were implemented, initiated or completed prior to an award generally are not eligible, and FEMA generally does not reimburse costs for these activities.[388]

If FEMA determines a property owner used private funds to demolish an event-damaged structure, and at the time of the demolition the property had not been in a subapplication submitted to FEMA, the demolition is not a connected action. Therefore, the demolition is not subject to FEMA review and approval for EHP compliance, and the costs of the demolition are not considered pre-award costs. Therefore, the demolition does not preclude a finding of project eligibility. If the demolition is not connected to a FEMA federal action, no FEMA EHP review of the demolition is necessary, and demolition costs will not be eligible for reimbursement under HMA programs. The demolition must be in accordance with state and local legal requirements and any applicable federal law. However, FEMA will continue to analyze the cumulative impacts of any privately conducted demolition and subsequent FEMA-assisted projects as required under the National Environmental Policy Act as part of its EHP review process. [389]

The federal action is recognized as beginning when the project subapplication is submitted to FEMA. Properties where pre-award demolition activities have occurred prior to the subapplication being submitted to FEMA may be eligible when:

- No demolition is underway at the time the subapplication is submitted. A homeowner-initiated demolition must be fully completed prior to that property being submitted to FEMA.

386 44 CFR § 77.6, 44 CFR Part 80
387 44 CFR § 80.9(b)
388 44 CFR § 80.9(b), 2 CFR § 200.458
389 Public Law 91-190 (Jan. 1, 1970), as amended

- Demolition costs are not included in the subapplication. Private individuals have demolished damaged structures using private funds or other non-federal funds prior to application for HMA.

- The demolition is in accordance with state and local legal requirements and any applicable federal law.

Once the property is included in an HMA subapplication submitted to FEMA, work must not be initiated prior to issuance of the subaward. Otherwise, the work would be a connected action and subject to FEMA review.

B.1.2.2.2. Sinkholes

Structures that show signs of damage that was determined to have been caused by sinkhole activity, or structures that have moved or have begun to move downward into a sinkhole, are eligible for consideration for acquisition, relocation, or demolition under the Hazard Mitigation Grant Program (HMGP), Hazard Mitigation Program Post Fire (HMGP Post Fire) and Building Resilient Infrastructure and Communities (BRIC).

Examples of indicators of sinkhole damage on or related to the structure, when accompanied by evidence of a sinkhole, may include:

- The descending of the structure below the original grade of construction.

- Doors and windows that fail to close properly or exhibit changed behavior.

- Cracks in walls, floors, adjacent pavement and the ground surface.

- Floors with sloping or unevenness that had not been apparent previously.

Sinkhole development may also be determined by observing disturbances around the affected structure. These site disturbances can support a determination that a sinkhole may be the cause of the structural damage listed above.

To be eligible for assistance, the applicant and subapplicant must submit supporting documentation that the cause of structural damage is sinkhole-related and at least partially due to a natural geologic process. The documentation must be prepared and signed by an appropriately registered, certified, or licensed state or local professional engineer, architect, landscape architect or geologist. Documentation of disturbances around the structure may also be included; however, the primary eligibility factor must be evident from structural damage from a sinkhole.

All other applicable eligibility considerations described in the other parts of the HMA Guide also apply.[390]

B.1.2.3. Ineligible Activities

A general list of ineligible activities is included in Part 4.

B.1.2.4. Cost-Effectiveness

Applicants and subapplicants must demonstrate that mitigation projects are cost-effective consistent with the requirements described in Part 5.

B.1.2.4.1. Pre-Calculated Benefits for Acquisitions

FEMA determined the national average for benefits for acquisition projects is $323,000. Based on this analysis, FEMA developed pre-calculated benefits for acquisition projects located in the SFHA (1% annual chance floodplain) and for certain projects, such as Repetitive Loss or Severe Repetitive Loss acquisitions, located outside the SFHA. For Benefit-Cost Analysis (BCA) purposes, acquisition/demolition and acquisition/relocation projects are treated the same.

An overview of the pre-calculated benefits to determine cost-effectiveness is provided in Table 18.

Table 18. Eligibility for Pre-Calculated Benefits Based on Structure Type and Location

Structure Location	Eligible Use Criteria
Acquisitions Within Special Flood Hazard Areas	
Single-Unit Residential Structure	The cost of the acquisition is less than or equal to $323,000.
Multi-Unit Residential Structure	The cost of the acquisition is less than or equal to $323,000 multiplied by the number of ground- or first-floor units.
Non-Residential Structure	The cost of the acquisition is less than or equal to $323,000, and the structure must be occupiable.
Acquisitions Outside Special Flood Hazard Areas	
Single-Unit Residential Structure Designated Repetitive Loss, Severe Repetitive Loss, or with the Lowest Floor Elevation below the Base Flood Elevation	The cost of the acquisition is less than or equal to $323,000.

[390] 44 CFR Part 80

Structure Location	Eligible Use Criteria
Multi-Unit Residential Structure Designated Repetitive Loss, Severe Repetitive Loss, or with the Lowest Floor Elevation below the Base Flood Elevation	The cost of the acquisition is less than or equal to $323,000 multiplied by the number of ground- or first-floor units.
Non-Residential Structure Designated Repetitive Loss, Severe Repetitive Loss, or with the Lowest Floor Elevation below the Base Flood Elevation	The cost of the acquisition is less than or equal to $323,000, and the structure must be occupiable.

B.1.2.4.1.1. PRE-CALCULATED BENEFITS FOR STRUCTURES LOCATED IN THE SFHA

FEMA has determined that the acquisition of a structure located in the SFHA, as delineated on the Flood Insurance Rate Map (FIRM) or based on best available data, with total project costs less than or equal to $323,000, is considered cost-effective.[391] For projects that contain multiple structures, the average cost of all structures in the project must meet the stated criterion (provided all structures are within the SFHA).

The specific geographic location of structures can increase acquisition costs. The benefit amounts identified above may be adjusted by using the most current location factors included in industry-accepted construction cost guides. If a multiplier is used, a copy of the source document must be included as part of the grant application.

The applicant or subapplicant must provide a map that clearly identifies the structure's footprint and delineates the SHFA, using the FIRM or best available data. If any part of the structure lies within the SFHA, the applicant or subapplicant can use the pre-calculated benefit value to demonstrate cost-effectiveness. No other detailed analysis is required. These pre-calculated benefits can be used in riverine and coastal SFHAs.

For up-to-date information on the dollar value of pre-calculated benefits visit the FEMA "Benefit-Cost Analysis" webpage.

B.1.2.4.1.2. PRE-CALCULATED BENEFITS FOR PROPERTIES LOCATED OUTSIDE THE SFHA

FEMA has determined that the acquisition of a structure designated as Repetitive Loss or Severe Repetitive Loss, regardless of location within or outside the SFHA, with total project costs less than or equal to $323,000, is considered cost-effective.[392] To use this pre-calculated benefit to demonstrate cost-effectiveness, the structure(s) in the acquisition project must meet one of the following definitions for Repetitive Loss or Severe Repetitive Loss.

[391] Total project costs include all applicable costs, not just the construction costs or federal share.
[392] Total project costs include all applicable costs, not just the construction costs or federal share.

Repetitive Loss refers to a structure or property meeting either (1) or (2) from the following definitions:

1. A structure that meets one of the two following qualifiers:
    a. Two or more claims of more than $1,000 paid by the National Flood Insurance Program (NFIP) within any rolling 10-year period since 1978.
    b. Two or more claims (building payments only) that, on average, equal or exceed 25% of the market value of the property.[393]
2. A structure covered by a contract for flood insurance made available under the NFIP that meets both of the two following qualifiers:
    a. Has incurred flood-related damage on two occasions, in which the cost of the repair, on average, equaled or exceeded 25% of the market value of the structure at the time of each such flood event.
    b. At the time of the second incidence of flood-related damage, the contract for flood insurance contains increased cost of compliance coverage.[394]

Severe Repetitive Loss refers to a structure or property meeting either (1) or (2) from the following definitions:

1. A structure that meets one of the two following qualifiers:
    a. Received four or more separate claim payments of more than $5,000 each (including building and contents payments).
    b. Received two or more separate claim payments (building payments only) where the total of the payments exceeds the current value of the property.[395]
2. A structure covered by a contract for flood insurance made available under the NFIP that has incurred flood-related damage and meets one of the two following qualifiers:
    a. Four or more separate claims payments (includes building and contents) have been made under flood insurance coverage with the amount of each such claim exceeding $5,000 and with the cumulative amount of such claims payments exceeding $20,000.

[393] 44 C.F.R. § 209.2 and Part 61, Appendices A(1)-A(3); FEMA, National Flood Insurance Program, Flood Insurance Manual, Appendix A, pages 11-12, and Appendix E, page 5 (April 2021); and FEMA, National Flood Insurance Program, Community Rating System Coordinator's Manual, pages 120-7 (2017)
[394] 42 U.S.C. § 4121(a)(7); and 44 C.F.R. § 77.2(i).
[395] 42 U.S.C. § 4014(h); FEMA, National Flood Insurance Program, Flood Insurance Manual, Appendix I, page 1, and Appendix L, page 8 (April 2021); and FEMA, National Flood Insurance Program, Community Rating System Coordinator's Manual, page 120-8 (2017).

b. At least two separate claims payments (includes only building) have been made under such coverage, with the cumulative amount of such claims exceeding the market value of the insured structure.[396]

Alternatively, FEMA has determined that the acquisition of a structure, where the Lowest Floor Elevation is lower than the Base Flood Elevation and the total project costs less than or equal to $323,000, is considered cost-effective.[397] For projects that contain multiple structures, the average cost of all structures in the project must meet the stated criterion.

If using the Lowest Floor Elevation and Base Flood Elevation to qualify, the Lowest Floor Elevation and Base Flood Elevation must be provided for each structure. No other detailed analysis is required.

The specific geographic location of structures can increase acquisition costs. The benefit amounts identified above may be adjusted by using the most current location factors included in industry-accepted construction cost guides. If a multiplier is used, a copy of the source document must be included as part of the grant application.

For up-to-date information on the dollar value of the pre-calculated benefit, refer to the FEMA "Benefit-Cost Analysis" webpage.

B.1.2.4.1.3. PRE-CALCULATED BENEFITS FOR MULTI-UNIT RESIDENTIAL STRUCTURES

If a multi-unit residential structure would otherwise qualify to use the acquisition pre-calculated benefit of $323,000, the benefit may be adjusted by multiplying the number of ground- or first-floor units by $323,000. For example, the pre-calculated benefit for an eight-unit apartment building with four ground-floor units would be $1,292,000 ($323,000 multiplied by the number of ground- or first-floor units [in this case, four]). If the entire project cost is less than that amount, the project could use the pre-calculated benefit for acquisitions if it meets the other requirements. Documentation such as building plans, should be provided to justify the number of first- or ground-floor units.

For up-to-date information on the dollar value of pre-calculated benefits, visit the FEMA "Benefit-Cost Analysis" webpage.

B.1.2.4.1.4. PRE-CALCULATED BENEFITS FOR NON-RESIDENTIAL STRUCTURES

The pre-calculated benefit for acquisitions may be used for non-residential structures if they would otherwise qualify by meeting the criteria described above (i.e., the structure is in an SFHA, is designated as Repetitive Loss or Severe Repetitive Loss, or has its Lowest Floor Elevation below the Base Flood Elevation). However, all structures counted must be occupiable, meaning they are designed to have people living or working in them. Small ancillary structures such as sheds,

[396] 42 U.S.C. § 4104c(h)(3); and 44 CFR § 77.2(j).
[397] Total project costs include all applicable costs, not just the construction costs or federal share.

outhouses and garages may not be counted in the number of structures, although they may be demolished as part of the project.

For up-to-date information on the dollar value of the pre-calculated benefit, refer to the FEMA "Benefit-Cost Analysis" webpage.

B.1.2.4.2. Substantially Damaged Structures in a Riverine SFHA

The acquisition of structures that are declared substantially damaged (from any hazard) and located in a riverine SFHA on a preliminary, advisory or effective FIRM are considered cost-effective. Substantial damage is defined as damage sustained by a building whereby the cost of restoring the building to its before-damaged condition would equal or exceed 50% of the market value of the building before the damage occurred.[398] If this methodology is used, the project subapplication must include a certification from the local floodplain administrator or a certified state/tribal floodplain specialist that identifies and declares the structure as substantially damaged.

B.1.2.4.3. Landslide Hazard Benefit-Cost Analysis

The FEMA BCA Toolkit includes a methodology for calculating the Benefit-Cost Ratio (BCR) for the acquisition of properties in landslide hazard areas where there is an immediate threat of catastrophic slope failure (within five years of application development).[399] Applicants are required to complete the BCR based on the replacement cost value, the number of occupants and the project costs; the BCA Toolkit will calculate all other values automatically using standard FEMA values and methodologies. The BCR calculation is based on having no recurrence interval because once the landslide occurs there would be a catastrophic failure, and the structure would not be at risk for further landslides. Applicants are required to attest that the structure is within five years of imminent collapse because of landslide hazards.

Immediate Threat

An immediate threat is defined in 44 CFR § 206.221(c) as "the threat of additional damage or destruction from an event which can reasonably be expected to occur within five years" (e.g., a 20% chance of occurrence per year).

B.1.2.4.4. Sinkhole Hazard Benefit-Cost Analysis

Applicants may use the landslide acquisition BCA approach for the acquisition of residential and non-residential properties in sinkhole hazard areas. This methodology does not incorporate a recurrence interval because once a sinkhole event occurs, failure would be catastrophic, and a total loss would result. Residential acquisition benefits are based on replacement cost value of the structure and contents, displacement costs and 5% of the value of human life. Benefits for non-residential

[398] 44 CFR § 59.1
[399] 44 CFR § 206.221(c)

acquisitions are based on the replacement cost value, relocation costs and business losses. For either type of acquisition, project costs include demolition and disposal or relocation. Applicants are required to attest that the structure is within five years of imminent collapse because of sinkhole hazards.

Costs are based on expenses required to purchase the house at the pre-event market value (like in routine flood-hazard acquisitions). Applicants are required to attest that the structure is within five years of imminent collapse because of sinkhole hazards. They may obtain this determination from a state or local professional geologist or engineer. If they hire a professional geologist or engineer to make the determination, the costs for those services may be eligible as a pre-award expense.

B.1.2.5. Feasibility and Effectiveness

Projects must be consistent with Part 4. Mitigation projects assisted by HMA programs must be both feasible and effective at mitigating the risks of the hazard(s) for which the project was designed. A project's feasibility is demonstrated through conformance with accepted engineering practices, established codes, standards, modeling techniques or best practices.

B.1.2.6. Environmental and Historic Preservation

All subapplications submitted to FEMA must meet the EHP criteria in Part 4. All subapplications must provide the information described in Part 6 so that FEMA may perform the EHP review.

Properties that are contaminated with hazardous materials are not eligible for acquisition.[400] The subrecipient must ensure a property with past or present commercial or industrial use and any adjacent properties suspected of having hazardous materials at the site are not contaminated when the project application is approved.

If FEMA selects the subapplication for further review, the subrecipient must meet the requirements of the Environmental Protection Agency's "all appropriate inquiries" rule,[401] including contracting with an appropriately qualified environmental professional to perform a Phase I environmental site assessment as defined by the rule. Any assessment must be in accordance with the procedures of the most current ASTM International Standard E1527, Standard Practice for Environmental Site Assessments: Phase I Environmental Site Assessment Process or ASTM International Standard E2247, Standard Practice for Environmental Site Assessments: Phase I Environmental Site Assessment Process for Forestland or Rural Property. The costs for meeting these requirements are considered eligible project costs if such costs are included in the project budget.

In accordance with these criteria and 44 CFR § 80.17(a), the subrecipient shall:

- Conduct interviews with past and present owners, operators and occupants.

[400] 44 CFR § 80.11(e)
[401] 40 CFR Part 312

- Search for recorded environmental cleanup liens.
- Review federal and state, local, tribal and territorial government records.
- Conduct visual inspections of the facility and of adjoining properties.

The purpose of the Phase I environmental site assessment is to identify conditions that are indicative of releases and threatened releases of hazardous substances, pollutants, contaminants, petroleum and petroleum products, and controlled substances on, at, in or to the subject property by gathering the following types of information about the subject property:

- Current and past property uses and occupancies.
- Current and past uses of hazardous substances.
- Waste management and disposal activities that could have caused releases or threatened releases of hazardous substances.
- Current and past corrective actions and response activities undertaken to address past and ongoing releases of hazardous substances.
- Engineering controls.
- Institutional controls.
- Current and past uses and conditions of adjoining properties and the surrounding area (consistent with ASTM E1527) that could be considered a recognized environmental condition (i.e., the presence or likely presence of any hazardous substances or petroleum products in, on or at the property).

The subrecipient must gather all publicly available information obtainable from its source within reasonable time and cost constraints and that can practicably be reviewed.

If the Phase I environmental site assessment "all appropriate inquiries" report identifies the presence of hazardous substances, pollutants, contaminants, petroleum and petroleum products, or controlled substances on, at or in the subject property, the subrecipient must require the owner to remove the materials or remediate the property in accordance with any applicable federal, state, local, tribal or territorial government requirements. If a Phase II environmental site assessment (to evaluate suspected areas and to identify the nature and extent of contamination on, at, in or to the property) is required, the costs of this study are not eligible mitigation grant project costs. Additionally, the cost of a Phase II environmental site assessment (to determine remediation plans, cleanup and certification of the property) is not an eligible mitigation grant project cost.

A contaminated property must be certified clean,[402] which requires a letter from the appropriate federal, state, local, tribal or territorial entity stating that no further remedial action is required to protect human health or the environment. A contaminated property must be certified clean before any interest in the property is purchased. The seller must also agree to indemnify the recipient, FEMA and the subrecipient for any liability arising from previous property contamination.

The *Acquisition Demolition-Required Information for EHP Review* FEMA job aid lists the documentation needed for FEMA to complete the EHP compliance review process for each project.

B.1.2.7. National Flood Insurance Program Eligibility Requirements

Mitigation projects sited within the SFHA are eligible only if the jurisdiction is participating in the NFIP. For FMA only, all properties included in a subapplication for acquisition must be NFIP-insured at the time of the opening of the application period. For more information, refer to Part 4.J.

B.1.3. PROPERTY ACQUISITION: APPLICATION AND SUBMISSION INFORMATION

All subapplications submitted to FEMA must meet the eligibility criteria in Part 4. All subapplications must have a scoping narrative in accordance with Part 6. Project-specific criteria are highlighted below.

FEMA may request additional information after the subapplication has been submitted to ensure that all necessary information is received. However, all information required by the regulations and the HMA Guide must be received before FEMA can make an assistance award decision or final approval.

Subapplicants are responsible for meeting the requirements and time frames in 44 CFR § 80.13 and for providing the information that is necessary for the applicant and FEMA to determine the eligibility of the project as described in the subapplication. The subapplication must also contain property and project information, including the project description and EHP information.

For property acquisition projects, the subapplication must include the following:

- The value of each property (pre-event or current, as appropriate) and documentation demonstrating how the market value was determined.
- An appeal or reconsideration process for property owners who dispute the purchase offer property valuation.
- *Statement of Assurances*.
- A sample of the deed restriction.

[402] 44 CFR § 80.17(a)

- Property owner documentation.
- Voluntary interest documentation.
- Certification of owner status for pre-event value.
- Consultation regarding other ongoing federal activities.

B.1.3.1. Clear Title

The subrecipient must conduct a title search for each property it plans to acquire. The purpose of the title search is to ensure the owner is the sole and actual titleholder to the property, to identify other persons with a property interest if the owner is not the sole and actual titleholder, and to ensure the title is clear (i.e., no mortgages or liens are outstanding on the sale of the property). In addition, the property must not have easements or other encumbrances that are incompatible with open space and would make the property either ineligible for acquisition or non-compliant with FEMA's open space land-use restrictions.

All known encumbrances that are incompatible with open space use must be revised or extinguished to ensure the property use is consistent with the open space requirements in 44 CFR Part 80 and the HMA Guide. New property acquisitions for properties encumbered with leases or other instruments allowing for subsurface hydraulic fracturing and horizontal directional drilling activities may be eligible for HMA funding. To demonstrate a clear fee title, the applicant will obtain a title insurance policy reflecting that all incompatible easements or other encumbrances to the title have been extinguished.[403]

If evidence obtained during the review indicates long-dormant subsurface rights (usually exceeding 50 years or beyond the reach of a standard title search) and the subsurface owner's identity is unknown or otherwise not reasonably ascertainable, FEMA may approve the eligibility of the acquisition on a case-by-case basis. If a right to access a subsurface resource is discovered and asserted after the acquisition, the recipient and subrecipient are required to take all appropriate action to enforce the open space restrictions required by 44 CFR § 80.19.

Other title-related requirements are as follows:

- A title insurance policy demonstrating the clear title must be obtained for each approved property that will be acquired.
- A physical site inspection for each property must be conducted to verify there are no physical encumbrances to the property (a site survey may be necessary to clearly establish property boundaries).

[403] 44 CFR § 80.17(b)

- The property title must be transferred by a warranty deed in all jurisdictions that recognize warranty deeds.
- All incompatible easements or encumbrances must be extinguished.
- The subrecipient organization must take possession at settlement.
- The subrecipient must record the deed at the same time as settlement along with the program deed restrictions.
- The deed transferring title to the property and the program deed restrictions will be recorded according to state law and within 14 calendar days after the settlement.
- All property transfers must be consistent with 44 CFR Part 80 and the HMA Guide.

B.1.3.2. Statement of Voluntary Participation

The *Statement of Voluntary Participation* (FF-206-FY-124) formally documents the notice of voluntary interest as required by 44 CFR § 80.13(4) and information related to the purchase offer. The subrecipient must provide FEMA with a signed copy of the *Statement of Voluntary Participation* for each property post-award. Subrecipients may choose to use their own modified version of the *Statement of Voluntary Participation* if it contains all elements of FEMA's *Statement of Voluntary Participation* and with prior approval from FEMA.

Participation is not voluntary for tenants of properties to be acquired and therefore tenants may be entitled to benefits under the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970 (URA).[404] For more information, refer to Part 12.B.1.3.7.2.

Participation in property acquisition and structure demolition or relocation projects by property owners is voluntary. Prospective participants must be informed in writing that participation in the program is voluntary and that the subapplicant will not use its eminent domain authority to acquire their property for the project purposes if negotiations fail and the property owner(s) chooses not to participate. Documentation of voluntary interest must be signed by each property owner and should be obtained as early in the project development as possible. The documentation must be submitted as specified in 44 CFR § 80.13. A notice of voluntary interest can be documented using individually signed statements or a group sign-up sheet. The documentation must include the printed name of property owner(s), property address, contact information and signature of the interested property owner(s) associated with each property, and clear acknowledgment by every property owner of the following language:

[404] Public Law 91-646 (Jan. 2, 1971), as amended

> This project for open space acquisition is voluntary and neither the *[insert applicant name]* nor the *[insert subapplicant name]* will use its eminent domain authority to acquire the property for open space purposes should negotiations fail and the property owner chooses not to participate.

During project implementation, the subrecipient must execute a more formal *Statement of Voluntary Participation* with the owner(s) of each property identified in the subapplication scope of work.

B.1.3.3. Statement of Assurances

Subapplications for property acquisition and structure demolition or relocation must include the FEMA *Statement of Assurances*. The FEMA *Statement of Assurances* must be signed by the subapplicant's authorized agent. The *Statement of Assurances* must provide acknowledgment of, and agreement to, the requirements in the *Statement of Assurances*.

Subapplications that do not include a signed *Statement of Assurances* are incomplete and will not be considered for assistance.

The *Statement of Assurances* describes the grants management responsibilities of local communities, including tribes or the qualifying conservation organization receiving grant assistance for acquisition projects. It is submitted with the initial subapplication and can also supplement the state/territory-local or state-tribal agreement. The *Statement of Assurances* includes information specific to acquisitions and must include the following:

- Declaration that the land will be maintained as open space for the conservation of natural floodplain functions, and the land uses will primarily consist of the "generally allowable uses" that are compatible with open spaces as indicated in 44 CFR Part 80, the HMA Guide and an official deed restriction of the property.
- Declaration that the local government, tribal government or qualifying conservation organization (subrecipient) will be responsible for all maintenance costs of the property.
- Declaration that the proposed acquisition is consistent with local hazard mitigation, land use and environmental plans, as well as relevant statute, regulations and the HMA Guide.
- Declaration that adjoining property owners will be notified about the acquisition project.

B.1.3.4. Deed Restriction Language

The subapplication must include a sample of the deed restriction (not including property-specific details) that the subapplicant intends to record with each property deed. The sample must be consistent with the FEMA *Model Deed Restriction*.

If the subapplicant makes any changes to the language in the *Model Deed Restriction*, the subapplicant must seek approval from the FEMA Office of Chief Counsel, through their FEMA regional

office, for the changes. Changes may be made for compliance with local requirements, but changes to substantive program provisions will not be approved.

The subapplicant must follow the procedure described in the previous two paragraphs for open space acquisitions in CBRS units. The subapplication must include a sample of the deed restriction for review and approval by the FEMA Office of Chief Counsel, through the FEMA regional office, to ensure compliance with all deed restriction requirements specific to these areas.

B.1.3.5. Activities Description and Schedule

As part of the scope of work, all subapplications must include an activities description referencing industry standards or project plans and specifications as well as a schedule for completing the activities.

Once a property is included in an HMA subapplication submitted to FEMA, no demolition work can be initiated prior to project review, approval and award. In addition, no work can be underway at the time the subapplication is submitted. However, properties where private individuals have demolished damaged structures using private assistance or other non-federal assistance prior to application for HMA are eligible for inclusion in HMA project applications if the demolition is not connected to the project. The demolition costs cannot be included in the project subapplication.

B.1.3.6. Costs

B.1.3.6.1. Allowable Property-Related Costs

Allowable costs are costs that are necessary and reasonable for the proper and efficient performance and administration of the federal award. Allowable costs for property acquisition and structure demolition or relocation projects for open space depend on the scope of the project.

Generally allowable costs are listed in Table 19. Other costs will be evaluated on a case-by-case basis.

A shortfall is the difference between the amount the subrecipient pays an owner for a damaged residence and the cost of a comparable replacement home in a non-hazard-prone location if the cost of the replacement home is higher. A shortfall is an allowable cost up to $31,000 per property.[405]

[405] To provide fair and equitable compensation, HMA has capped the shortfall amount at $31,000, which is the threshold for replacement housing payments set by the URA (42 U.S.C. § 4623(a)). This amount may be updated periodically by regulation (49 CFR § 24.401).

Table 19: Generally Allowable Costs for Property Acquisition and Structure Demolition or Relocation

Generally Allowable Costs for Property Acquisition and Structure Demolition or Relocation
Both Structure Demolition and Relocation
▪ Market value of the real property (land and structures) either at the time of sale or immediately prior to the most recent disaster or flood event, subject to applicable adjustments, provided state/local laws do not prohibit future improvements and/or require structure demolition. ▪ Removal of demolition debris and household hazardous wastes to an approved landfill (including debris from the demolition of houses, garages, driveways, sidewalks and above-grade concrete slabs). ▪ Abatement of asbestos and/or lead-based paint. ▪ Removal of septic tanks; if not removed, floors and walls must be cracked or crumbled so the tank will not hold water, and the tank must be filled with sand or another clean fill. ▪ Permitted disposal of fuel tanks that support residential use only. ▪ Removal of all structure foundation and basement walls to at least 1 foot below the finish grade of the site. ▪ Filling of basements with compacted clean fill (basement floors must have a minimum 1-foot-diameter hole in the floor to allow for drainage). ▪ Removal of only the trees, if any, that restrict the demolition work on any structure. ▪ Termination of all abandoned utilities at least 2 feet below the finish grade of the site. ▪ Capping of all wells and/or removal of associated components. ▪ Grading, seeding, leveling and site stabilization of all demolition sites. ▪ Fees for necessary appraisals, title searches, title insurance, property inspections, permit fees and surveys. ▪ Property tax liens or tax obligations can be extinguished with proceeds from property sale while performing the transfer of title. ▪ Fees associated with the title transfer, contract review and other costs associated with conducting the real estate settlement, including recordation of the deed and deed restrictions. ▪ Development of an adaptive land management strategy for the purpose of addressing long-term management of the acquired property and developing funding strategies.

Generally Allowable Costs for Property Acquisition and Structure Demolition or Relocation

Structure Demolition Only

- Market value of the real property (land and structures) either at the time of sale or immediately prior to the most recent disaster or flood event, subject to applicable adjustments, provided state/local laws do not prohibit future improvements and/or require structure demolition.
- For land already owned by an eligible entity, compensation is for the structure and for development rights only, not for the land. This includes any entity eligible to apply for award or subaward assistance under the relevant assistance program, even if the entity is not the applicant or subapplicant for the project.
- Removal of demolition debris and household hazardous wastes to an approved landfill (including debris from the demolition of houses, garages, driveways, sidewalks and above-grade concrete slabs).
- Abatement of asbestos and/or lead-based paint.
- Removal of septic tanks; if not removed, floors and walls must be cracked or crumbled so the tank will not hold water, and the tank must be filled with sand or other clean fill.
- Permitted disposal of fuel tanks that support residential use only.
- Removal of all structure foundation and basement walls to at least 1 foot below the finish grade of the site.
- Filling of basements with compacted clean fill (basement floors must have a minimum 1-foot-diameter hole in the floor to allow for drainage).
- Removal of only the trees, if any, that restrict the demolition work on any structure.
- Termination of all abandoned utilities at least 2 feet below the finish grade of the site.
- Capping of all wells and/or removal of associated components.
- Grading, seeding, leveling and site stabilization of all demolition sites.
- Fees for necessary appraisals, title searches, title insurance, property inspections, permit fees and surveys.
- Property tax liens or tax obligations can be extinguished with proceeds from property sale while performing the transfer of title.
- Fees associated with the title transfer, contract review and other costs associated with conducting the real estate settlement, including recordation of the deed and deed restrictions.

Generally Allowable Costs for Property Acquisition and Structure Demolition or Relocation

Structure Relocation Only

- Market value of the real property (land only).
- For land already owned by an eligible entity, compensation is for the development rights. This includes any entity eligible to apply for award or subaward assistance under the relevant assistance program, even if the entity is not the applicant or subapplicant for the project.
- Removal of demolition debris and household hazardous wastes to an approved landfill (including debris from the demolition of attached appurtenances such as porches, decks, skirting, ramps, awnings, garages, driveways, sidewalks and above-grade concrete slabs).
- Abatement of asbestos and/or lead-based paint.
- Removal of septic tanks; if not removed, floors and walls must be cracked or crumbled so the tank will not hold water, and the tank must be filled with sand or other clean fill.
- Permitted disposal of fuel tanks that support residential use only.
- Removal of all structure foundation and basement walls to at least 1 foot below the finish grade of the site.
- Filling of basements with compacted clean fill (basement floors must have a minimum 1-foot-diameter hole in the floor to allow for drainage).
- Removal of only the trees, if any, that restrict the demolition work on any structure.
- Termination of all abandoned utilities at least 2 feet below the finish grade of the site.
- Capping of all wells and/or removal of associated components.
- Grading, leveling and site stabilization of all demolition sites.
- Fees for necessary appraisals, title searches, title insurance, property inspections, plan reviews, permit fees and surveys.
- Property tax liens or tax obligations can be extinguished with proceeds from property sale while performing the transfer of title.
- Fees associated with the title transfer, contract review and other costs associated with conducting the real estate settlement, including recordation of the deed and deed restrictions.
- Jacking and moving the structure to a different site.
- The reasonable cost of disassembling, moving and reassembling any attached appurtenances such as porches, decks, skirting, ramps and awnings.
- Necessary site preparations, including foundation, water, sewer and utility hookups.
- Site restoration and site stabilization of the acquired site.

B.1.3.6.2. Non-Allowable Costs

Property-related costs that are not allowable under HMA programs include but are not limited to the following:

- Compensation for land that is already held by an eligible entity, even if the eligible entity is not the subapplicant for the project; however, compensation for development rights (e.g., obtaining an open space easement) may be an allowable cost.

- Property acquisition and structural demolition projects where state and/or local laws or ordinances create a legal condition that requires structure demolition and/or prohibits future development of the property (e.g., a coastal setback requirement).
- Remediation, remediation plans, and environmental cleanup and certification of contaminated properties; however, permitted disposal of incidental demolition, household hazardous wastes and fuel tanks that support a residential use only may be an allowable cost.
- Aesthetic improvements and landscaping, new site property acquisition, and public infrastructure and utility development.

B.1.3.7. Budget

All subapplications must include a line-item breakdown of all anticipated costs.

Subapplicants may apply for subrecipient management costs to cover administrative costs. Management costs must be included in the subapplication budget as a separate line item. More information about the requirements for management cost requests can be found in Part 13.

The final Mitigation Offer to a property owner is based on the value assigned to a property ("purchase offer") and applicable additions and deductions. Deductions to the purchase offer may include duplication of benefits deductions, and additions may include any supplemental housing or insurance incentive payments. The subrecipient must ensure all property owners are treated fairly and are offered an equitable package of benefits. The subrecipient (using *a Statement of Voluntary Participation*) must inform each property owner in writing the market value (pre-event or current) of the property and the method used to determine the final Mitigation Offer.

If several entities or programs are acquiring property in the same area, property owners may find it confusing if different offers are made to area owners at different times. To avoid any negotiation difficulties or confusion, FEMA recommends the subrecipient coordinate the release of property valuation information and purchase offers to property owners for the various programs. The subrecipient may wish to set a time limit with the property owner for the validity of a purchase offer. The subrecipient must provide an appeal or reconsideration process for property owners who dispute the amount of the purchase offer property valuation.

B.1.3.7.1. Purchase Offer: Value of the Property

For each property identified for acquisition, the subrecipient shall establish and document a property value based on market value, which is defined as:

> The amount in cash, or on terms reasonably equivalent to cash, for which in all probability the property would have sold on the effective date of the valuation, after a reasonable exposure time on the open competitive market, from a willing and reasonably knowledgeable seller to a willing and reasonably knowledgeable buyer, with neither acting

> under any compulsion to buy or sell, giving due consideration to all available economic uses of the property at the time of the valuation.[406]

The current market value reflects the property value at the time of the final Mitigation Offer. Pre-event market value is defined as the market value of the property immediately before the relevant event that affected the property. For HMGP and HMGP Post Fire, the relevant event for assistance is the major disaster under which assistance is available. For BRIC, the pre-event market value is the value before the most recent major disaster declaration; however, if the project is occurring separately from or more than 12 months after a disaster event, the current market value may be more appropriate. For FMA, the pre-event market value is defined as the property's value immediately before the most recent flood event resulting in an NFIP claim of at least $5,000.

The benefit of the pre-event market value is available only to owners who owned the property during the event and are nationals of the United States or qualified aliens. [407] If the current property owner purchased or took possession of the disaster-damaged property after the major relevant event or is not a national of the United States or qualified alien, the subrecipient may not offer the owner more than the current market value.[408]

The relevant event may vary under the HMA programs, but the pre-event market value or current market value may be used at the recipient's discretion. The recipient should coordinate with the subrecipient to determine whether the valuation should be based on the pre-event market value or current market value. The current market value may be the most efficient method if no damage has occurred to the property or if a reasonable amount of time has elapsed since the event.

FEMA generally does not include subsurface mineral valuations in the current market value. However, there is no legal or regulatory requirement to exclude those values. Costs associated with surface or subsurface land appraisal are considered part of the overall cost-effectiveness evaluation of any acquisition project.

Typically, property acquisition and structure demolition or relocation projects require the valuation of the property (land and structures as a whole). When an eligible entity already owns the property and wants to deed-restrict it, valuation is for the structure and development rights instead of for the land. Relocation projects require the valuation of land only.

B.1.3.7.1.1. VALUATION METHODOLOGY

The following appraisal methodology must be used to determine property value:

- The appraisal must be conducted by an appraiser in accordance with The Appraisal Foundation's *Uniform Standards of Professional Appraisal Practice*.

[406] As defined by the *Uniform Appraisal Standards for Federal Land Acquisitions* (2016).
[407] 8 U.S.C. § 1101(a)(22), 8 U.S.C. § 1641(b)
[408] 44 CFR § 80.17(c)(3)

- The appraiser must comply with relevant state laws and requirements and have the appropriate certification, qualifications and competencies based on the type of property being appraised.
- The subrecipient must coordinate with the recipient to determine the assumptions that will be used in the appraisal (i.e., current or pre-event market value), and the assumptions must be applied consistently throughout the project area for all properties to be acquired.
- When determining the value for many structures, the subrecipient may conduct appraisals to establish a statistical sampling of property values and develop an adjustment factor to apply to tax-assessed values so that they reasonably reflect each property's market value.

Potential deductions from and additions to the purchase offer must also be considered.

B.1.3.7.1.2. PURCHASE OFFER AND NATIONALITY

Before the property owner can receive a pre-event value for the property, the subrecipient must provide certification obtained from the property owner that the property owner is a national of the United States or a qualified alien. For property owners who are not nationals of the United States or qualified aliens, or who refuse to provide certification, the subrecipient will offer no more than the appraised current market value for the property.[409]

Prior to the award or final approval, subrecipients will ask all property acquisition and structure demolition or relocation project participants (property owner(s)) to certify they are a national of the United States or a qualified alien. Subrecipients will offer participants who refuse to provide such certification, or who are not national of the United States or qualified aliens, no more than the appraised current market value for their property. Participants who refuse to certify or are not national of the United States or qualified aliens may not receive supplemental housing payments.

For property owners who are seeking pre-event value, subrecipients may use *Declaration and Release* (FEMA Form 009-0-3) as certification of the nationality of participating property owner(s). At the time of certification, the subrecipient will ask the property owner to show a form of identification (any government-issued identification displaying the signer's name). If the property owner has

[409] "National of the U.S." is defined in 8 U.S.C. § 1101(a) as (A) a citizen of the United States or (B) a person who is not a citizen but who owes permanent allegiance to the United States. "Qualified alien" is defined in 8 U.S.C. § 1641 as: [A]n alien who, at the time the alien applies for, receives, or attempts to receive a Federal public benefit, is – (1) an alien who is lawfully admitted for permanent residence under the Immigration and Nationality Act (INA) [8 U.S.C. § 1101 et seq.], (2) an alien who is granted asylum under INA Section 208 [8 U.S.C. § 1158], (3) a refugee who is admitted to the United States under INA Section 207t [8 U.S.C. § 1157], (4) an alien who is paroled into the United States INA Section 212(d)(5) [8 U.S.C. § 1182 (d)(5)] for a period of at least one year, (5) an alien whose deportation is being withheld under INA Section 243(h) [8 U.S.C. § 1253] (as in effect immediately before the effective date of Section 307 of Division C of Public Law 104-208) or INA Section 241(b)(3)t [8 U.S.C. § 1231(b)(3)] (as amended by Section 305(a) of Division C of Public Law 104-208), (6) an alien who is granted conditional entry pursuant to INA Section 203(a)(7) [8 U.S.C. § 1153 (a)(7)] as in effect prior to April 1, 1980; or (7) an alien who is a Cuban and/or Haitian entrant (as defined in Section 501(e) of the Refugee Education Assistance Act of 1980).

applied for FEMA disaster assistance, Form 009-0-3 will already be on file at FEMA, and the subrecipient will instead request verification from FEMA through the recipient that a certification is on file.

B.1.3.7.1.3. DEDUCTIONS FROM THE PURCHASE OFFER

The recipient, subrecipient and property owner must identify and report any potential duplication of benefits. FEMA may assist with this process if needed, but it is the responsibility of the recipient and subrecipient to validate all duplication of benefits. Refer to the FEMA "Duplication of Benefits" webpage for more in-depth information. FEMA deducts benefits from other sources from the purchase offer. Repair assistance that has been used for its intended purpose is generally not deducted if documentation of the use is provided.

Examples of when duplication of benefits may occur in a property acquisition and structure demolition or relocation project are as follows:

- The subrecipient offers the full pre-event market value to the property owner, but the property owner cannot provide documentation to demonstrate that assistance such as insurance, loans, repair grants, compensation in compliance with a court order, or other such assistance has been used for its intended purpose. This is because payment of the full pre-event market value compensates the owner for the loss of value that has occurred.

- The subrecipient offers the full pre-event market value to the property owner, but legal claims are appropriate or legal obligations arise in connection to the property that may provide a benefit to the property owner. The parties involved in pending legal disputes must take reasonable steps to recover benefits available to them.

- Relocated tenants receive relocation assistance and rental assistance but have received payments for the same purpose as part of the disaster assistance provided by any agency or payments from any other source. Any acquisition-related assistance provided to tenants must be reduced accordingly. However, tenant-related duplication of benefits deductions do not affect the amounts available to the property owner.

For property valuations based on the pre-event market value, the following procedures can help prevent mitigation assistance from duplicating benefits available from other sources:

- The subrecipient establishes the purchase offer property value as of a certain date.

- The subrecipient provides the recipient with a list of property owners participating in the property acquisition and structure demolition or relocation project as well as a list of tenants who may be affected by the acquisition.

- The recipient and FEMA inform the subrecipient of the amount of repair or replacement assistance available to each property owner and rental or relocation assistance available to

tenants. FEMA provides NFIP coverage information to the recipient and subrecipient, including the amount paid on a claim and the amount of coverage available.

- The subrecipient coordinates with property owners who must disclose all assistance received for the same purpose, as described above, including repair or replacement assistance received, all insurance benefits available to them under an existing policy (whether they submitted a claim), and any potential recovery of assistance based on litigation or other legal obligations. The property owner must take reasonable steps to recover such amounts. The subrecipient must coordinate with tenants who must disclose any amounts received from rental or relocation assistance.

- When a property owner receives a Small Business Administration loan for repairs, the property owner must provide proof that loan funds were spent as intended so that they are not deducted as a duplication of benefits. In accordance with Small Business Administration requirements, loans must be repaid at the acquisition closing or rolled over to the new property. When a property owner receives Small Business Administration loan funds to complete a mitigation activity, HMA funds cannot duplicate the purpose covered by the loan, nor can they be used in the form of a grant for loan "swap" or to pay down a Small Business Administration loan.

- The subrecipient identifies any other potential sources of benefits to the subrecipient, property owner or tenant.

- The subrecipient must reduce the purchase offer by the amount of any duplication of benefits. Deductions are not taken for any amounts the owner can verify with receipts that were expended on repairs or cleanup. Subrecipients may not credit property owners for their own labor hours for repair work.

- For insurance payments made for which the purpose is unspecified, property owners may submit an affidavit stating that the unspecified settlement will be used for personal property replacement or documentation from the insurance company specifying the type of losses covered by the previously unspecified settlement. If the property owner submits an affidavit, upon receipt of the affidavit, the recipient and subrecipient will treat the payment as a personal property settlement that is not subject to a duplication of benefits deduction.

B.1.3.7.1.4. ADDITIONS TO THE PURCHASE OFFER

If the purchase offer for a property is less than the amount the property owner must pay to purchase a comparable replacement dwelling in a non-hazard-prone site in the same community, the recipient and subrecipient may choose to make available to the property owner a supplemental payment of up to $31,000 that would be applied to the difference. Subrecipients should consider the cost of relocating to a permanent residence that is of comparable value and is functionally equivalent.

For the property owner to receive a supplemental payment, the recipient and subrecipient must demonstrate that the following circumstances exist:

- Assistance cannot be secured from other more appropriate sources, such as housing agencies or voluntary groups.
- Decent, safe and sanitary housing of comparable size and capacity is not available in non-hazard-prone sites within the community at the anticipated acquisition price of the property being vacated.
- The project otherwise would have a disproportionately high adverse effect on low-income or minority populations because project participants in these populations would not be able to secure comparable decent, safe and sanitary housing.[410]
- Participants have certified that they are nationals of the United States or qualified aliens.

The recipient has the option of allowing subrecipients to provide a credit to property owners who have flood insurance. The subrecipient provides an incentive payment that is equal to up to five years of flood insurance premiums actually paid by the current property owner for an NFIP policy for structure coverage. This is applicable to all programs.

B.1.3.7.2. Tenants

Although the property owner must voluntarily agree to participate in an open space project, participation is not voluntary for residential and business tenants and owners of mobile homes who rent homepads (homepad tenants) and who must relocate because of the acquisition of their housing. Therefore, these tenants are entitled to assistance as required by the URA, as amended.[411] Property owners participating in FEMA-assisted property acquisition and structure demolition or relocation projects are not entitled to relocation benefits because the voluntary program meets URA exceptions.

URA regulations define "tenant" as a person who has the temporary use and occupancy of real property that is owned by another. URA relocation benefits to displaced tenants include moving expenses, replacement housing rental payments and relocation assistance advisory services. Displaced tenants include owners of manufactured homes who lease a pad site. The amount of assistance the subrecipient must pay the tenant is provided in 49 CFR Part 24, Subpart E. An eligible displaced tenant is entitled to:

- Reasonable out-of-pocket (or fixed schedule) moving expenses.
- Compensation for a reasonable increase in rent and utility costs incurred in connection with the relocation in certain circumstances.

[410] 49 CFR § 24.2(a)(8)
[411] 42 U.S.C. § 4601 et seq.

- Relocation assistance payments for tenants are intended to ensure these individuals can relocate to decent, safe and sanitary comparable replacement dwellings outside the floodplain or hazard area.

If a tenant chooses to purchase a replacement dwelling, the tenant may apply the amount of rental assistance they would be entitled to toward the down payment. Similarly, if a mobile homeowner who rents a homepad chooses to purchase a replacement pad or lot, the mobile homeowner may apply the amount of rental assistance they would be entitled to toward the down payment.

An alien who is not lawfully present in the U.S. is not eligible to receive URA relocation benefits or relocation advisory services. FEMA may approve exceptions if this results in unusual hardship to the alien's spouse, parent or child who is a U.S. citizen, or an alien admitted for permanent residence. Subrecipients will ask tenants who are potential recipients of URA assistance to certify that they are U.S. citizens or are lawfully present in the U.S. Subrecipients will not provide URA assistance to participants who are not or who refuse to certify that they are U.S. citizens or lawfully present.

Additional instructions for implementing URA requirements can be found in 49 CFR Part 24. Subrecipients must coordinate closely with the recipient and FEMA when implementing URA requirements. The state Department of Transportation (DOT) is often a good resource in determining how to calculate the appropriate URA payment because the Federal Highway Administration is the lead federal agency for the URA.

B.1.3.7.2.1. RENTAL INCREASE PAYMENT

A tenant displaced from a dwelling because of a federally-assisted property acquisition and structure demolition or relocation project is entitled to a rental increase payment if:

- The tenant rents or purchases and occupies a decent, safe and sanitary replacement dwelling within one year after the date the tenant moves out of the original dwelling.
- The tenant occupied the displacement dwelling for the 90 calendar days preceding the initiation of negotiations for acquisition of the property.

The initiation of negotiations is defined as the first formal indication that the subrecipient wants to purchase a particular property. Any tenant who occupied the dwelling before a disaster event is usually eligible. The exception is if the project negotiations are unrelated to the disaster event or begin so long after the event that it is no longer a relevant factor. If the dwelling is reinhabited after the event, former tenants are generally not eligible. A signed lease is preferable for proving tenancy, but other documentation such as utility bills may be used to prove tenancy if a signed lease is not available because of the disaster event.

Compensation for a rent increase is 42 times the amount that is obtained by subtracting the "base monthly rent" for the displacement dwelling from the monthly rent and average monthly cost of utilities for a comparable replacement dwelling, or the decent, safe and sanitary replacement dwelling now occupied by the displaced person.

The "base monthly rent" for the displacement dwelling is the lesser of the average monthly cost for utilities plus the rent at the displacement dwelling as determined by FEMA, or 30% of the tenant's average gross household income. The rental increase payment may not exceed a total of $7,200. [412]

Subrecipients may exceed the limits identified in the URA in extraordinary circumstances if necessary to ensure a displaced tenant will be able to obtain and retain a comparable unit that is decent, safe and sanitary (as defined at 49 CFR § 24.2(a)(8)) outside a high-hazard area. A rental assistance payment may, at the subrecipient's discretion, be disbursed in a lump sum or installments. If any Department of Housing and Urban Development programs are providing partial assistance for the project, the subrecipient must verify the program requirements to ensure proper coordination with mitigation program requirements.

B.1.3.7.2.2. RENTAL ASSISTANCE FOR HOMEPAD TENANTS

Mobile homeowners who lease a homepad and who must relocate to a new homepad because of the acquisition of their pre-disaster homepad are entitled to URA relocation benefits and/or replacement housing payments. Payments to mobile homeowners may not duplicate insurance payments or payments made by other federal, state, local or voluntary agencies. Complex situations involving FEMA mobile homes that have been donated to a state or local government and then sold to the mobile homeowner should be directed to the appropriate FEMA regional office for eligibility determination and calculation of benefits.

Displaced mobile homeowners who rent their homepads are entitled to assistance as described below. In some cases, the combination of the two types of URA assistance may exceed URA's statutory maximum replacement housing differential of $31,000.

The displaced mobile homeowner/homepad tenant is entitled to compensation for rental and utility increases resulting from renting a comparable homepad and moving expenses as described in this section. Compensation for homepad rent increase is 42 times the amount obtained by subtracting the "base monthly rent" for the displacement homepad from the monthly rent and the average monthly cost of utilities for a comparable replacement homepad. The rental increase payment may not exceed a total of $7,200.

Displaced mobile homeowners may also be entitled to replacement housing assistance. For URA purposes, the mobile homeowner is considered to be involuntarily displaced from the residence because of the homepad owner selling the property. In addition, if the mobile home is also purchased, the displaced mobile homeowner is entitled to replacement housing assistance to compensate for their need to find replacement housing. Compensation for mobile home replacement is equivalent to the amount obtained by subtracting the value of the purchased mobile home from the cost of a new replacement mobile home.

[412] The amount of the rental increase payment is set forth by the Uniform Relocation Act (42 U.S.C. § 4624(a)) and may be updated periodically by regulation (49 CFR § 24.402).

In some cases, it may not be possible to secure a comparably located site for a replaced/displaced mobile home; thus, the site on which the home is ultimately placed is called "last resort housing." The cost to find and/or obtain such a site may exceed the statutory maximum differential replacement housing payment of $31,000. Last resort housing cases can result when the subapplicant has not adequately planned for the relocation of mobile homepad tenants. If a comparable location for a replacement mobile home cannot be found, the homepad tenant may be eligible for replacement housing payments up to the cost of a traditionally constructed home that is comparably located.

B.1.3.7.2.3. REQUIREMENTS FOR APPLICATIONS INVOLVING MOBILE HOMEOWNERS

Subapplicants seeking assistance for mobile home park acquisitions must demonstrate capacity to administer the subaward within the project budget. To demonstrate capacity, the subapplication should include:

- An estimate of the number of mobile homes that will be involuntarily displaced.
- Identification of in-house URA expertise or an estimate of the cost of obtaining URA expertise shown as a line item in the project budget.
- A preliminary relocation analysis discussing whether an adequate stock of potential replacement sites and/or dwellings is available.

B.1.3.7.2.4. TENANT BUSINESSES

Tenant businesses that are involuntarily relocated because of a FEMA-assisted property acquisition and structure demolition or relocation project are entitled to URA benefits. Assistance provided to a tenant business cannot duplicate payments from insurance or any other source. Thus, Small Business Administration loans and other types of financial assistance received after the disaster must be subtracted from benefits received under the URA. The recipient and subrecipient should seek assistance from the appropriate FEMA regional office in determining benefits for tenant businesses. The state Department of Transportation can be a good resource for determining benefits for tenants because the Federal Highway Administration oversees the applicability of the URA.

B.1.3.8. Consultation Regarding Other Ongoing Federal Activities

Because properties acquired under HMA programs must be permanently converted to open space and will be unavailable for future development, subapplicants must coordinate with the appropriate federal agency or agencies in accordance with 44 CFR § 80.13 to ensure other federal actions that would affect the parcels under consideration for acquisition for open space are not anticipated.

If other federal activities are planned in the proposed project area, the subapplicant will need to forgo an open space acquisition project and pursue other mitigation project options. If the subapplicant decides to proceed with the acquisition project, the subapplicant must include documentation of their coordination under this section in the subapplication.

Consultation with state DOTs, the U.S. Army Corps of Engineers (USACE) and other federal agencies is discussed below.

B.1.3.8.1. United States Army Corps of Engineers

The allowed uses of open space that have been created as a result of an acquisition project generally do not include levee systems for flood risk management purposes, and subapplicants will be required to reject consideration of such use if they accept FEMA assistance to convert a property to permanent open space.[413] The subapplicant must demonstrate in the subapplication that they have consulted with USACE regarding each subject property's potential future use for the construction of a levee system.[414] FEMA will not award assistance for any property without this documentation. This restriction does not generally apply to structures for ecosystem preservation, restoration or enhancement.

If the initial consultation with USACE indicates that there is a potential consideration for a levee in the area, the subapplicant must undertake an expanded consultation with the applicant, FEMA and USACE. FEMA can help assist in this expanded coordination. The consultation will involve the identification and full consideration of future potential land-use conflicts to enable an informed decision regarding how best to proceed.

If, after the consultation, the decision is to pursue a FEMA-assisted property acquisition and structure demolition or relocation project, the subapplication must include an assurance, resolution or equivalent document adopted by the local governing body that indicates the following:

- In consultation with USACE, the local government has identified and considered the future potential use of acquired land for the construction of levees and has chosen to proceed with the acquisition of permanent open space.
- The local government understands that land acquired for open space purposes under the relevant mitigation program will be restricted in perpetuity to open space uses and will be unavailable for any use that is incompatible with the open space and floodplain purposes designated for the property. These incompatible uses include the construction of flood damage reduction levees, paved roads, and other development.

B.1.3.8.2. Departments of Transportation

The subapplicant must demonstrate in the subapplication that they have coordinated with the relevant state Department of Transportation to ensure future plans do not contain any improvements or enhancements to federal aid systems or other state transportation projects that would affect the

[413] In the rare circumstances where the Administrator has determined competing federal interests were unavoidable and has analyzed floodplain impacts for compliance with 44 CFR § 60.3 or higher standards, the Administrator may find only USACE projects recognized by FEMA in 2000 and 2003 and improvements to pre-existing federal-aid transportation systems to be allowable uses. (44 CFR § 80.19(a)(ii)).
[414] 44 CFR § 80.13(b).

proposed project area under consideration.[415] The construction of such transportation improvements, enhancements or projects on open space land is incompatible with open space uses and is not allowed.

B.1.3.8.3. Other Federal Agencies

The applicant and subapplicant must demonstrate in the application and subapplication, respectively, that they have consulted with other federal agencies, as appropriate, regarding other program requirements and/or activities and have identified the relationship between the requirements and activities to FEMA mitigation activities and assistance. Other federal agency requirements may apply to mitigation activities if other agency assistance is used for activities related to the project in the community or for matching the mitigation assistance, such as Community Development Block Grant assistance or Community Development Block Grant-Disaster Recovery assistance.

Other federal agency assistance may be used to contribute to the non-federal share of a FEMA-assisted mitigation project if both programs' requirements are met. Refer to Part 4 for more information on federal assistance that is allowed to be used as a non-federal cost share. The applicant is responsible for coordinating with the programs that are available in the state. The coordination should include local program representatives and approaches and schedules. The objective should be to make the process as simple and consistent as possible for subapplicants and property owners.

B.1.3.8.4. Consultation Regarding Properties in the Coastal Barrier Resources System

For any proposed action that involves the acquisition of a structure for open space purposes that is within or attached to the CBRS, the FEMA regional administrator, as required by Section 6 of the Coastal Barrier Resources Act, consults with the designated representative of the Department of the Interior at the regional level before approving the action.

The request for consultation is in the form of a memorandum to the Interior Department representative that contains the following:

- Identification of the CBRS unit.
- Description of the structure and the property to be acquired and demolished or relocated, including the identification of the structure as an exception under Section 6 of the Coastal Barrier Resources Act[416] and full justification of its status as an exception.
- Amount of proposed federal assistance.

[415] 44 CFR § 80.13(b).
[416] 16 U.S.C. § 3505

- Any additional required mitigation measures.
- A determination of the action's consistency with the purposes of the Coastal Barrier Resources Act, in accordance with 44 CFR § 206.349.

Pursuant to FEMA's understanding with the Interior Department, the Interior Department representative provides technical information, an opinion on whether the proposed action meets the criteria for the Coastal Barrier Resources Act exception, and an opinion on whether the action is consistent with the purposes of the Coastal Barrier Resources Act if consistency is required. The Interior Department is expected to respond in a timely manner from the date of the FEMA request for consultation. If a timely written response is not received, the FEMA regional administrator will contact the Interior Department representative to determine whether the consultation request was received.

When the regional Interior Department representative's opinion is that the proposed action should not be taken and the issue cannot be resolved at the regional level, the FEMA regional administrator submits the issue to the Director of the Office of Environmental Planning and Historic Preservation and the Mitigation Directorate for review. Consultation is accomplished at FEMA headquarters with the Interior Department consultation officer, the Office of Environmental Planning and Historic Preservation, and the Mitigation Directorate in coordination with the FEMA Office of Chief Counsel. The Director of the Office of Environmental Planning and Historic Preservation and the Mitigation Directorate then approves or does not approve the proposed action.

B.1.4. PROPERTY ACQUISITION: SUBAWARD IMPLEMENTATION

B.1.4.1. Notification Process Required Under the Disaster Recovery Reform Act

Section 1231 of the Disaster Recovery Reform Act of 2018[417] specifies that within 60 calendar days of the award, the recipient's hazard mitigation officer or designated representative provides notification to each affected unit of local government with detailed information on the subrecipient's approved acquisition projects. The notification must include the following:

- The location and address of the acquisition property.
- A description of the acquisition project (i.e., latitude/longitude coordinates to the nearest sixth decimal place, a legal description and other identifying characteristics).
- A copy of the model deed restrictions for acquired properties.
- The state/territory-local or state-tribal grant assistance agreement.

[417] Public Law 115-254 (Oct. 5, 2018)

B.1.4.2. Relocation and Removal of Existing Buildings

Existing buildings that are part of an open space acquisition and demolition or relocation project must be removed and disposed of in accordance with applicable laws within 90 calendar days of closing and settlement of the property acquisition transaction. The recipient and subrecipient are responsible for the removal and disposal.

Even if numerous properties are purchased on different dates, the recipient and subrecipient are still responsible for structure disposal or removal within 90 calendar days of settlement for each property. The FEMA regional administrator may grant an exception for multiple properties in a single project when the properties are individually identified, and the need for an exception is justified in accordance with the regulations.[418] The recipient must submit a written request to the regional administrator stating the justification for additional time (that will extend beyond the 90-day time limit) for demolishing or relocating any structure, including a specific date for removal.

All relocated structures in open space acquisition and relocation projects must be placed on a site outside (1) an SFHA, (2) any regulatory erosion zones at a distance at least 60 times the average annual erosion rate measured from an appropriate "erosion reference feature," and (3) any other identified hazard areas. The owner is responsible for ensuring the building is brought into compliance with all applicable laws and regulations.

Existing buildings that are part of an open space acquisition and demolition project must be demolished (resulting in the permanent destruction of each structure) and disposed of in accordance with applicable laws.

After a disaster, the demolition and debris removal of acquired structures may be eligible for reimbursement under the FEMA Public Assistance (PA) program if the structures represent a health and safety hazard because of the disaster. States/recipients and subrecipients should coordinate with the appropriate FEMA regional office to determine whether these costs are eligible under the PA program. If the demolition costs do not qualify for PA program assistance, they are eligible project costs under the relevant mitigation program if submitted as part of a project subapplication. If any parts of the structure are sold for salvage value, the total cost of the project will be reduced by the salvage value before cost shares are calculated.

B.1.4.3. Budget and Scope of Work Changes

Recipients are required to report deviations from budget, project scope or objectives in accordance with Part 8. Recipients must request prior approvals from FEMA for budget and program plan revisions.[419]

[418] 44 CFR § 80.17(d)
[419] 2 CFR § 200.308

B.1.5. PROPERTY ACQUISITION: CLOSEOUT

Recipient and subrecipients must closeout projects in a timely manner consistent with Part 9.

At the completion of the award/subaward activity, FEMA and the recipient shall verify that all required subaward activities have been accomplished in accordance with all program guidance and proper grants management practices and 44 CFR § 80.21, that all properties identified in the subapplication have been acquired, and that the *Model Deed Restriction* language was recorded with each corresponding deed.

The subrecipient shall provide to FEMA, through the recipient, the following property information:

- Photograph(s) of the property site after project was completed.
- A copy of the recorded deed that includes *Model Deed Restriction* language for each property.
- Latitude and longitude of each property given to the nearest sixth decimal place.
- A signed *Statement of Voluntary Participation* from the owner(s) of each property identified in the subaward scope of work.
- Description of how pre-event market value was determined, if applicable.
- Documentation of duplication of benefits review.
- Date structure was removed from property (this must be 90 calendar days from date of settlement).
- Update of the property site information in the respective HMA electronic system database for each structure, noting if the property was mitigated, the closing date, and the amount paid to the homeowner(s).
- For relocation projects, a certificate of occupancy from the local government agency or building department for each relocated structure to certify that the structure is code compliant.
- For FMA only, documentation that the property owner-maintained flood insurance until the property was sold.

B.1.6. PROPERTY ACQUISITION: POST CLOSEOUT DISPOSITION AND REPORTING REQUIREMENTS

B.1.6.1. Program Reporting and Monitoring

The recipient will work with subrecipients to ensure the property is maintained in accordance with land-use restrictions. The recipient and subrecipients must jointly monitor and inspect acquired properties every three years, based on the recipient's three-year reporting cycle, to ensure the inspected parcels continue to be used for allowable open space purposes. Subrecipients cannot include long-term monitoring costs in their project application. Costs outside the period of performance are not eligible.

Every three years, the subrecipient, the recipient and FEMA must coordinate to ensure the subrecipient submits documentation to the appropriate FEMA regional administrator certifying that the subrecipient has inspected the subject property within the month preceding the report and that the property continues to be maintained consistent with the provisions of the award/subaward. If the property subsequently transfers to an allowable transferee, the subrecipient, the recipient and FEMA will coordinate with that entity to submit the information.

The recipient, subrecipient and FEMA have the right to enter the parcel, with notice, to inspect the property to ensure compliance with land-use restrictions. Subrecipients may identify the open space nature of the property on local tax maps to assist with monitoring.

B.1.6.2. Post-acquisition Land Use

Once the land is acquired and designated as open space, FEMA must review the subrecipient's proposed change in land use, unless the changed use is grading and seeding of the original building site.

Uses that require review include but are not limited to:

- Establishing an encumbrance or easement (such as a utility easement or mineral rights lease).[420] FEMA may approve requests for post-acquisition use that will encumber previously acquired properties with leases or other instruments allowing for subsurface hydraulic fracturing and horizontal directional drilling activities. However, surface activities and related appurtenances, equipment and/or wastewater disposal associated with hydraulic fracturing are not uses compatible with open space and are not allowed on the acquired parcel.
- Building any kind of structure or other development on the site (e.g., grading outside the building footprint, dredging, mining, filling, paving, excavation or removal of vegetation, and planting). [421]

[420] 44 CFR § 80.19(b)
[421] 44 CFR § 80.19(a)(2)

- Storing equipment and materials.

As part of the subrecipient's proposed change in land use, the subrecipient must submit a written request to the recipient for review. The recipient must review the request to verify the land use follows all open space requirements and should coordinate with the subrecipient to ensure all necessary information is provided. The recipient must forward the request to FEMA for review together with a recommendation whether the recipient considers the land use is allowable. FEMA will review the information submitted and verify program requirements have been met. FEMA will review the request and notify the recipient of their determination.

B.1.6.3. Non-Allowable Land Uses of Open Space

Land uses that are generally not allowable include:

- Surface activities associated with hydraulic fracturing that obstruct the floodplain and/or impact flood risk, which include but are not limited to the well bore mouth, well head, well pad, drilling site, storage facility, transport equipment and wastewater disposal such as injection wells, evaporation ponds and discharge into surface water.
- Walled buildings or manufactured homes, except public restrooms (reuse of pre-existing structures is not allowed unless all walls are removed).
- Installation of septic systems or reuse of pre-existing septic systems except to service a permissible restroom.
- Fences and all other obstructions in the floodway; fences outside the floodway must be designed to minimize trapping debris.
- Flood risk reduction structures, such as levees, dikes or floodwalls.
- Paved roads, highways, bridges and paved parking areas that include asphalt, concrete, oil-treated soil or other material that inhibits floodplain functions.
- Storage of inventory supporting a commercial operation or governmental facility, including wheeled vehicles or movable equipment.
- Cemeteries, landfills, storage of any hazardous or toxic materials, or other uses that are considered environmentally contaminating, dangerous or a safety hazard.
- Actions that pose health, safety or environmental risk in the floodplain.
- Aboveground or underground pumping stations or storage tanks.
- Placement of fill materials except where necessary to avoid affecting on-site archaeological resources.

- Other uses that obstruct the natural and beneficial use of the floodplain.
- Long-term human habitation.

B.1.6.3.1. Non-Allowable Uses of Open Space in the Coastal Barrier Resources System

For projects in CBRS units, the following land uses of acquired open space are generally not allowed:

- Any use FEMA determines is inconsistent with the allowable land uses identified above.
- Any uses determined by the recipient and/or FEMA as inconsistent with the regulations, the HMA Guide or deed restrictions.
- Paved surfaces.

Communities may creatively salvage pre-existing structures on the acquired property. In some cases, the complete demolition of a structure may not be necessary—converting a closed-in structure with walls, such as a house, into an open picnic pavilion with a concrete slab floor and posts supporting the roof is possible.

B.1.6.4. Subsequent Transfer of a Property Interest

For post-federal award, the subrecipient may transfer a property interest only with the prior approval of the appropriate FEMA regional administrator and only to certain entities in accordance with 44 CFR § 80.19(b) and the HMA Guide.

After acquiring the property interest, the subrecipient, including successors in interest, may convey any interest in the property only if the appropriate FEMA regional administrator, through the recipient, gives prior written approval of the transferee. The transferee must be another public entity or a qualified conservation organization. Property transfer to private citizens and corporations will not be approved. A qualified conservation organization is an organization whose purpose has been conservation for at least two years before the opening of the application period that resulted in the transfer of the property interest to the subrecipient, pursuant to Section 170(h)(3) and (4) of the Internal Revenue Code of 1954,[422] and the applicable implementing regulations. The transferee must document its status as a qualified conservation organization where applicable.

Any request to convey an interest in the property must include a signed statement that contains documentation of the following:

- The proposed transferee acknowledges and agrees to be bound by the terms of the original mitigation award/subaward conveyance according to 44 CFR Part 80 and the HMA Guide.

[422] Public Law 591, Chapter 736 (Aug. 16, 1954), as amended

- Reference and incorporation of the original deed restrictions providing notice of the conditions in this section.
- Incorporation of a provision for the property interest to revert to the subrecipient or recipient in the event the transferee ceases to exist or loses its eligible status as defined under this section.[423]

The subrecipient may convey an easement or lease to a private individual or entity for purposes that are compatible with the uses described in 44 CFR § 80.19 and the HMA Guide with prior approval of the appropriate FEMA regional administrator and as long as the conveyance does not include authority to control and enforce the terms and conditions identified above. The FEMA regional administrator may choose to consult with the FEMA Office of Chief Counsel in reviewing documents proposed to convey an interest in the property. Any lease or easement must be for uses that are compatible with open space purposes and is clearly subject to the land use and other restrictions of the property by reference and/or incorporation of the recorded deed restriction language.

B.1.7. PROPERTY ACQUISITION FOR OPEN SPACE: RESOURCES

Property Acquisition for Open Space Resources

- FEMA *Model Deed Restriction*: https://www.fema.gov/sites/default/files/2020-08/fema_model-deed-restriction.pdf
- FEMA BCA Toolkit: https://www.fema.gov/grants/guidance-tools/benefit-cost-analysis
- FEMA BCA: https://www.fema.gov/grants/guidance-tools/benefit-cost-analysis
- FEMA EHP review job aids: https://www.fema.gov/grants/mitigation/job-aids (search "technical review")
- ASTM International Standard: https://www.astm.org/Standards/E2247.htm
- FEMA *Statement of Voluntary Participation*: https://www.fema.gov/sites/default/files/documents/fema_form-ff-206-fy-21-124.pdf
- FEMA *Declaration and Release*: https://www.fema.gov/sites/default/files/documents/fema_form-ff-104-FY21-128_042022.pdf
- HMA Tool for Identifying Duplication of Benefits: https://www.hsdl.org/c/abstract/?docid=729185
- U.S. Fish and Wildlife Service Coastal Barrier Resources Act Project Consultation: https://www.fws.gov/cbra/Consultations.html

[423] 44 CFR § 80.19

B.2. Mitigation Reconstruction

B.2.1. MITIGATION RECONSTRUCTION: OVERVIEW

Mitigation reconstruction is the construction of an improved, elevated structure on the same site where an existing structure and/or foundation has been partially or completely demolished or destroyed. These projects include either total or partial demolition of the structure and result in the construction of code-compliant and hazard-resistant structures on elevated foundation systems. Mitigation reconstruction projects are not allowed in the regulatory floodway or Coastal High Hazard Area (Zones V, VE and V1-V30 on FIRMs). Mitigation reconstruction projects must be designed using the best available data, including Base Flood Elevations, if available. Activities that result in the construction of new living space at or above the Base Flood Elevation will be considered only when consistent with the mitigation reconstruction requirements.

B.2.2. MITIGATION RECONSTRUCTION: ELIGIBILITY

Mitigation reconstruction projects are eligible under HMGP, HMGP Post Fire, BRIC and FMA. Mitigation reconstruction projects cannot be combined with other activity types in the same project subapplication to ensure the subapplication scope, schedule and budget adhere to program requirements.

B.2.2.1. Eligible Activities

Eligible activity categories under HMGP, HMGP Post Fire, BRIC and FMA are summarized in Table 20.

Eligible mitigation reconstruction costs are limited to a $220,000 federal share per structure. Some eligible activities, such as administrative allowances and permitting allowances, permitting fees and accessible facilities or ramps compliant with applicable accessibility standards[424] when required or requested by the owner, do not need to be included in the $220,000 maximum federal share.[425] Required accessibility standards may include construction of ADA-compliant access facilities or ramps when an owner or a member of the owner's family has a permanent disability and a physician's written certification. An ADA-compliant access to ingress/egress is allowable for assistance unless specified otherwise in applicable state or local codes. If ramps are not technically feasible, a mechanical chair lift may be installed.

[424] Public Law 101-336 (July 26, 1990), as amended, 42 U.S.C. § 12101.

[425] The applicable accessibility standard may depend on whether the structure is a government or public facility or a private dwelling. If applicable, the ADA Accessibility Standards and/or Architectural Barriers (ABA) Act Accessibility Standards would apply, although ADA and ABA standards are substantially the same. See U.S. Access Board, The Architectural Barriers Act. If no standards apply, accessibility features should conform with the ADA Accessibility Standards unless stated otherwise in state or local codes.

The activities that are eligible as part of a federal award in mitigation reconstruction are divided into three categories: consultation and project scoping, pre-construction activities, and construction activities. The activities in each category that are eligible to the extent reasonable and necessary to perform the project purpose and their assistance limits are identified in Table 21.

Mitigation reconstruction projects include either total or partial demolition of the site. All demolition debris shall be removed and taken to an approved landfill. The following must be considered during demolition:

- Asbestos and lead-based paint must be dealt with appropriately.
- Existing associated structures, garages and above-grade concrete slabs must be removed.
- Abandoned septic tanks, if not removed, must be emptied and the floors and walls must be cracked or crumbled to prevent the tank from holding water. The tank must be filled with sand or another clean fill.
- All foundation and basement walls not included in the project footprint shall be removed to at least one foot below the finished grade of the site or as necessary to construct the new foundations.
- All basements not included in the mitigation reconstruction project footprint shall be filled with compacted clean fill. Prior to filling, basement floors should be provided with a minimum 1-foot-diameter hole in the floor to allow for drainage.
- Only trees that restrict the mitigation reconstruction work on any structure may be removed.
- Any abandoned utilities shall be terminated at least 2 feet below the finished grade of the site.
- Any abandoned wells shall be capped, and associated components removed.
- All disturbed areas must be graded and leveled; the top 12 inches of soil should be capable of supporting vegetation in areas not included in the reconstructed footprint.

Table 20: Eligible Mitigation Reconstruction Activities

Activity	HMGP	HMGP Post Fire	BRIC	FMA
Project scoping	Yes	Yes	Yes	Yes
Pre-construction activities	Yes	Yes	Yes	Yes
Construction activities	Yes	Yes	Yes	Yes
▪ Structural shell	Yes	Yes	Yes	Yes

Activity	HMGP	HMGP Post Fire	BRIC	FMA
▪ Interior partitioning	Yes	Yes	Yes	Yes
▪ Utility equipment	Yes	Yes	Yes	Yes
▪ Fixtures	Yes	Yes	Yes	Yes
Demolition and removal activities	Yes	Yes	Yes	Yes

Table 21: Eligible Mitigation Reconstruction Activities and Assistance Limits

Activity	Subject to Federal Share Assistance Limit of $220,000
Project scoping	
Structure verification (e.g., size of pre-existing structure)	No
Preliminary elevation determination	No
Phase I environmental site assessment	No
Engineering feasibility study (e.g., Can an existing structure be elevated? Is mitigation reconstruction feasible?)	No
BCA	No
Title search (e.g., ownership verification)	No
Pre-construction activities	
Site survey (i.e., boundaries, elevation)	No
Soils/geotechnical testing; testing for asbestos and lead-based paint	No
Archaeological assessment Phase I	No
Local, state and federal permitting (e.g., EHP and USACE)	No
Architectural/engineering design/plans/specifications	No
Plan review	No
Construction activities	
Permitted disposal of routine asbestos, lead-based paint and household hazardous wastes incidental to demolition	No
EHP mitigation as required as a special award condition	No

Activity	Subject to Federal Share Assistance Limit of $220,000
Demolition/removal	Yes
Erosion control/grading/drainage	Yes
Utility connections	Yes
Landscaping for site stabilization (e.g., seeding)	Yes
Walkways and driveways not required to meet accessibility standards	Yes
Elevated foundation construction	Yes
Inspection of foundation system	No
Structural shell	
Framing	Yes
Exterior doors	Yes
Windows (includes protection)	Yes
Access/egress	Yes
Exterior classing	Yes
Roofing	Yes
Interior partitioning	
Drywall	Yes
Trim	Yes
Painting	Yes
Interior doors	Yes
Insulation	Yes
Utility equipment	
Heating, ventilation and air conditioning	Yes
Water/wastewater plumbing	Yes
Electrical panel and wiring	Yes
Hot water heater	Yes

Activity	Subject to Federal Share Assistance Limit of $220,000
Fixtures	
Sinks/toilets/showers	Yes
Lighting	Yes
Cabinets and countertops	Yes
Flooring	Yes
Building inspections	No
Certificate of occupancy	No
Final *Elevation Certificate* (FEMA Form 086-0-33)	No
Owner displacement costs	No
Tenant displacement costs	No
Prepare and record flood insurance requirement (after construction finalized)	No

B.2.2.2. Ineligible Activities

Some mitigation reconstruction activities and their associated costs are not eligible. Ineligible costs include but are not limited to the following:

- Landscaping for ornamentation (e.g., trees, shrubs).
- Decks and garages not included as part of the foundation system.
- All construction activities not specifically noted in the HMA Guide and not specifically approved by FEMA in advance.
- Site remediation of hazardous materials.

A general list of ineligible activities is included in Part 4.

B.2.2.3. Cost-Effectiveness

Applicants and subapplicants must demonstrate that mitigation projects are cost-effective. Projects must be consistent with Part 5.

Mitigation reconstruction projects in the SFHA may use the $205,000 pre-calculated benefit for elevations. For details on this pre-calculated benefit, refer to B.3.2.4.1. For up-to-date information on the dollar value of the pre-calculated benefit, refer to the FEMA "Benefit-Cost Analysis" webpage.

FEMA limits the federal cost share of mitigation reconstruction project to $220,000 per structure. However, the costs captured in the BCA must reflect the total project cost required to complete the mitigation activity, not just the federal share.

B.2.2.4. Feasibility and Effectiveness

Projects must be consistent with Part 4. Mitigation projects funded by HMA programs must be both feasible and effective at mitigating the risks of the hazard(s) for which the project was designed. A project's feasibility is demonstrated through conformance with accepted engineering practices, established codes, standards, modeling techniques or best practices.

B.2.2.4.1. Codes and Standards

All mitigation reconstruction activities must be completed in accordance with the latest published editions of the International Codes and Federal Flood Risk Management Standard requirements. FEMA will *u*se the latest published edition of American Society of Civil Engineers (ASCE)/Structural Engineering Institute (SEI) Standard 24, *Flood Resistant Design and Construction* (referred to as ASCE 24), or its equivalent as the minimum design criteria for all HMA-assisted mitigation reconstruction projects in flood hazard areas.

FEMA will use the latest published edition of ASCE 24 or its equivalent as the minimum design criteria for all HMA-assisted structure mitigation reconstruction projects in flood hazard areas. These flood hazard areas include floodways, coastal high-hazard areas and other high-risk flood hazard areas such as alluvial fans, flash flood areas, mudslide areas, erosion-prone areas and high-velocity areas. ASCE 24 addresses design and construction requirements for new buildings and Substantial Improvements to existing buildings (including repair of substantial damage) located, in whole or in part, in flood hazard area. ASCE 24 sets forth requirements for elevation, foundation designs, enclosures below elevated buildings, materials, wet and dry floodproofing, utility installations, building access and miscellaneous structures (e.g., decks, porches, patios, garages, chimneys and fireplaces, pools and above- and belowground storage tanks).

In addition, all mitigation reconstruction projects in flood hazard areas must also comply with the requirements established by the Federal Flood Risk Management Standard, conform to local floodplain regulations, and be permitted by the local floodplain administrator. All other applicable state and federal permits must also be obtained.[426] Refer to Part 4.I for more information about these requirements.

FEMA published *Guidance for Applying ASCE 24 Engineering Standards to HMA Flood Retrofitting and Reconstruction Projects* (Nov. 2013) to assist applicants with the practicalities of how to apply the latest published edition of the ASCE 24 to their projects. ASCE/SEI24 applies to both new construction and substantial improvements.

[426] 44 CFR § 60.3

The height to which a foundation can be constructed is a key factor in determining feasibility. Assistance in evaluating flood mitigation techniques can be found in FEMA 551, *Selecting Appropriate Mitigation Measures for Floodprone Structures* (March 2007). All proposed mitigation measures in FEMA 551 must be consistent with other HMA program criteria, such as eligible activities.

FEMA developed guidance for designing appropriate foundations based on the requirements of the International Codes and other applicable coastal construction standards. That guidance is included in FEMA P-550, *Recommended Residential Construction for Coastal Areas: Building on Strong and Safe Foundations, Second Edition* (Dec. 2009), which also includes sample foundation design calculations and drawings and detailed descriptions of the considerations for determining the feasibility of constructing to the required height. Although FEMA P-550 was developed in response to reconstruction needs after Hurricane Katrina, the design solutions can be used in coastal and non-coastal flood zones. FEMA P-550 recommends that users choose the appropriate foundation by following the Foundation Selection Decision Tree and that the sample designs be used for a maximum height of 8 feet for a closed foundation and up to 15 feet for an open foundation. A licensed design professional should be consulted to determine feasibility for residential structures with required foundation heights that are greater than 15 feet.

Mitigation reconstruction projects must be designed and constructed to the minimum standard as established by the requirements of the latest published editions of the International Codes. Structures, including all parts and appurtenances, must be designed and constructed to safely support all loads, including dead loads, live loads, roof loads, floor loads, wind loads, flood loads, snow loads, seismic loads and combinations of loads expected to be imposed on the structure as defined in the codes and related documents referenced in the codes. The construction of structures must result in a system that provides a complete load path capable of transferring all loads from the point of origin through load-resisting elements to the soils supporting the foundations.

One- and two-family dwellings must be designed and constructed to meet, at a minimum, the requirements of the latest published editions of the International Code Council (ICC) *International Residential Code* and ASCE 24. The standards include ICC Appendix G to the International Building Code (IBC), *Flood Resistant Construction*, for all occupancies including residential, commercial and other occupancies. The latest published edition of the International Codes will be the acceptable requirement if the jurisdiction has not adopted a consensus-based code or if the adopted code is older than the two latest published editions of the applicable International Codes.

Multi-family dwellings must be designed and constructed to meet, at a minimum, the requirements of the most recently published editions of the International Codes. These codes are the minimum applicable requirement until and unless a subsequent edition of that code is adopted by the governing jurisdiction. For purposes of this program, the absence of an adopted building code in a participating jurisdiction or a jurisdiction's use of a building code that does not meet the International Codes' requirements will not relieve the subapplicant from meeting the minimum design and construction requirements.

Installation of manufactured homes must follow regulations and guidance provided by the Department of Housing and Urban Development and the state administering agency. In addition, for installations in the SFHA, the flood provisions in the latest published edition of National Fire Protection Association (NFPA) 225, *Model Manufactured Home Installation Standard*, are the minimum requirement. This document details the standards for preparing sites and foundations on which manufactured homes are installed and the procedures for on-site installation of homes.

FEMA provides additional guidance, including recommended prescriptive pre-engineered foundation design in FEMA P-85, *Protecting Manufactured Homes from Floods and Other Hazards, Second Edition* (Nov. 2009). FEMA P-85 provides a best-practices approach in reducing damage from natural hazards.

Project construction documents, including design drawings and specifications, must be signed and sealed by a design professional licensed in the state the project is to be constructed in. The documents must also be certified for compliance with the codes, standards and minimum construction requirements specified in the HMA Guide. Construction documents must be produced prior to the start of construction but are not required for submittal as part of an application. The construction documents must include a statement from a design professional (i.e., a licensed architect or licensed professional engineer in the state the project is located in) that the design meets or exceeds the applicable most recently published editions of the International Codes. Construction documents based on standard details developed by a manufacturer or material supplier, including framing members, framing connections and roofing, and siding or appurtenance fasteners must be signed and sealed by a design professional licensed in the state the project is constructed in.

B.2.2.5. Environmental and Historic Preservation

All subapplications submitted to FEMA must meet the EHP criteria in Part 4. All subapplications must provide the information described in Part 6 so that FEMA may perform the EHP review.

The *Mitigation Reconstruction-Required Information for EHP Review* FEMA job aid lists the documentation needed for projects for FEMA to complete the EHP compliance review process.

B.2.2.6. National Flood Insurance Program Eligibility Requirements

Mitigation projects sited within the SFHA are eligible only if the jurisdiction is participating in the NFIP. For FMA only, all properties included in a subapplication for mitigation reconstruction assistance must be NFIP-insured at the time of the opening of the application period. The flood insurance policy must be maintained throughout the period of performance and for the life of the structure. For more information, refer to Part 4.J.

B.2.2.7. Special Flood Hazard Area Requirements

For structures in the SFHA at the completion of the project and all structures receiving FMA regardless of location in the SFHA, flood insurance must be maintained for the life of the property.[427] For more information, refer to Part 4.J.

B.2.3. MITIGATION RECONSTRUCTION: APPLICATION AND SUBMISSION INFORMATION

All subapplications submitted to FEMA must meet the eligibility criteria in Part 4. All subapplications must have a scoping narrative in accordance with Part 6. Project-specific criteria are highlighted below.

FEMA may request additional information after the subapplication has been submitted to ensure all necessary information is received. However, all information required by the regulations and the HMA Guide must be received before an assistance decision and award or final approval can be made.

For mitigation reconstruction projects, the subapplication must include the following:

- In the mitigation activity section of the subapplication, an explanation of why the subapplicant has chosen mitigation reconstruction instead of the other available activity types.
- Latitude/longitude to the nearest sixth decimal place, site photographs, site maps, and project plans and specifications with the location of the structure clearly labeled on a FIRM.
- An activities description (as part of the scope of work) referencing industry standards or project plans and specifications.

B.2.3.1. Budget

All subapplications must include a line-item breakdown of all anticipated costs.

Subapplicants may apply for subrecipient management costs to cover administrative costs. Management costs must be included in the subapplication budget as a separate line item. More information about the requirements for management cost requests can be found in Part 13.

A detailed project budget shall be prepared by or under the supervision of the licensed design professional responsible for project design. Details pertaining to the project budget, such as submittal format, cost ranges, preparation requirements and source documentation are included in Part 6.

Each project requires a project budget as part of the technical and cost-effectiveness evaluation process. The project budget must include all reasonably anticipated project costs, including direct

[427] 42 U.S.C. § 4012a(a)

costs associated with project scoping and construction and closeout activities. The project budget should also be based on standard-grade construction.

Federal share assistance will be estimated and obligated on a per-square-foot basis; reimbursement will be in a manner consistent with standard recipient procedures. Based on the foundation type and required elevation height, the applicant or subapplicant must develop a square-foot cost for each potential combination of structure characteristics. All structures of the same type within a subapplication will have costs allocated at the same square-foot rate. Subapplicants will identify the type and number of structures of each possible combination to be included in the proposed project.

For cost-estimating purposes, the breakdown of structure types is based on the following structure and foundation characteristics:

- Structure type:
  - One story.
  - Two story.
- Foundation type:
  - Open foundation.
  - Closed foundation.
- Foundation height:
  - 0 to 5 feet.
  - 5 to 10 feet.
  - 10 to 15 feet.
  - Over 15 feet.

Applicants or subapplicants must provide documentation of all square-foot budgets. Costs must be provided in dollars-per-square-foot format. The costs must be based on the construction of fundamental, code-compliant structures with essential appurtenances as described. This will allow a comparative review of projects of varying types within a region and will ensure reasonable construction costs have been submitted.

B.2.3.2. Activities Description

The activities description in the scope of work for mitigation reconstruction projects is expected to include the following general construction-related activities:

- Pre-construction.
- Site preparation.
- Foundation construction.
- Structural shell construction.
- Interior finishes.
- Construction completion.

The activities are discussed further in Part 6.

In developing the mitigation reconstruction scope of work, the subapplicant should consider health issues involved with working with asbestos, mold and lead-based paint.

The subapplicant should document whether the structure can be safely elevated with a low likelihood of collapse or disintegration during the process and if there is the need for a licensed engineer or architect to ensure structure elevation is possible.

The square footage of a resulting structure must be no more than 10% greater than that of the original structure. Breezeways, decks, garages and other appurtenances are not considered part of the original square footage unless situated on the original foundation system. Original square footage must be documented in the subapplication through copies of tax records or other verifiable means.

To facilitate project development and to ensure all potential costs have been estimated, a conceptual design of proposed activities must be prepared during subapplication development.

B.2.3.2.1.1. MITIGATION RECONSTRUCTION PROJECT SCOPING

Project scoping involves identifying and evaluating all aspects of a mitigation reconstruction project from beginning to end. This includes developing detailed project specifications, developing a work plan, and ensuring the project mitigates future damage to the reconstructed structure. During project scoping, consideration should be given to all factors that have the potential to significantly affect project implementation, including work schedule, project location, project cost and project effectiveness.

Although each structure's construction will be designed by a licensed professional as part of the implementation of the project, basic design parameters for each structure must be established during project scoping, including foundation type, required foundation height, flood hazard conditions, appropriate wind design, project cost and site conditions. To aid potential subapplicants through the project scoping process, FEMA has developed detailed information regarding project budgets (refer to Part 6).

All reasonable and necessary costs, including anticipated project costs, direct costs associated with project scoping and project review, changes suggested by a licensed design professional, and costs for the pre-construction and construction activities listed in Table 21 are eligible project costs. All costs shall be based on the construction of fundamental, code-compliant structures as related to the codes and standards included or referred to in the HMA Guide.

B.2.3.2.1.2. DESIGN PARAMETERS

The primary design parameters that must be considered during project scoping include:

- Foundation type: A key consideration for scoping mitigation reconstruction projects is the required type of foundation. The type of foundation for a specific mitigation reconstruction project is based on the location of the structure within a defined flood zone (based on the Base Flood Elevation, Advisory Base Flood Elevation or best available data) and the required height of the proposed structure above adjacent grade. During project scoping, the applicable flood zone or flood hazard area for each structure must be identified in addition to the associated foundation design requirements; this will help subapplicants determine the appropriate foundation type. The type of foundation that is selected affects the type and cost of construction and must be identified prior to subapplication submittal. Assistance in evaluating flood mitigation techniques can be found in FEMA 551. Detailed guidance on foundation designs and design parameters can be found in FEMA P-550.

- Foundation height: The required height to which a foundation must be constructed is a key factor in determining feasibility and cost. Assistance in evaluating flood mitigation techniques can be found in FEMA 551. FEMA developed guidance for designing appropriate foundations based on the requirements of the International Codes and other applicable coastal construction standards. That guidance is included in FEMA P-550, which also includes sample foundation design calculations and drawings. In this document, FEMA recommends sample designs and associated height limitations for various foundation types. For residential structures with required foundation heights greater than these limits, a licensed design professional must be consulted to determine feasibility.

- Wind design considerations: All mitigation reconstruction activities must be completed in accordance with the latest published editions of the International Codes, which include required wind design speed for the project location. An additional consideration is the requirement for the installation of shutters or other protective measures in windborne debris regions, defined as hurricane-prone regions located within 1 mile of the coastal mean high-water line where the basic design wind speed is 130 miles per hour (mph) or greater, or in areas where the basic wind design speed is 140 mph or greater, or Hawaii. During project scoping, projects located in these areas must be identified, and the associated cost of shutters or protective measures must be included in project costs.

- Seismic considerations: For purposes of code application, seismic reconstruction of buildings will be considered as new buildings. All mitigation reconstruction activities must be

completed in accordance with the latest published editions of the International Codes and ASCE/SEI 7, *Minimum Design Loads for Buildings and Other Structures*, which include the required seismic design for the project location and expected seismic performance for new buildings. During project scoping, projects located within these areas must be identified and the associated cost of seismic design measures or protection must be included in project costs.

- Project cost: The requirements and preferences for mitigation reconstruction developed through the parameters described above will significantly affect the proposed activities' cost. Proposed costs must be developed for consideration of mitigation options and completion of the BCA. Detailed guidance on costing procedures is available from the appropriate FEMA regional office. In addition to these specific parameters, other considerations may need to be addressed during project scoping, including:
  - Zoning requirements and other local ordinances.
  - Soil conditions.
  - Site access requirements.
  - EHP considerations.

HMGP, HMGP Post Fire, BRIC and FMA offer assistance for scoping and the development of engineering analyses to determine feasibility under project scoping/advance assistance. For more information, refer to Part 11.B.

B.2.3.3. Schedule

If increased cost of compliance assistance through a standard flood insurance policy is used as cost-share for a project, policyholders have up to six years from the date of the underlying flood loss to complete the eligible mitigation activity. The increased cost of compliance payment is up to $30,000; it can be used as the non-federal match for demolition, elevation, relocation and floodproofing of a structure substantially damaged by flooding. Consideration of increased cost of compliance as local cost share should be early in the scoping or project development process.

B.2.3.4. Feasibility and Effectiveness Documentation

All subapplications must provide information so FEMA can determine the feasibility and effectiveness of the proposed mitigation activity. Refer to Part 6 for more information.

B.2.3.5. Environmental and Historic Preservation Documentation

All subapplications submitted to FEMA must meet the EHP criteria in Part 4. All subapplications must provide the information described in Part 6 so that FEMA may perform the EHP review.

B.2.4. MITIGATION RECONSTRUCTION: SUBAWARD IMPLEMENTATION

Project implementation includes everything needed to complete the project. Implementation includes the pre-construction activities of plan review and inspection; site preparation; and all construction activities, including building the foundation and structural shell, completing the interior finishes, as well as obtaining all builder certifications.

B.2.4.1. Pre-Construction Activities

Pre-construction activities for each structure include project design, analysis and permitting required to meet the assistance requirements.

The project design will be performed by or under the direct supervision of a design professional (i.e., a licensed architect or licensed professional engineer in the state the project is located in). The design must include all calculations, analysis and research necessary to determine the forces expected to act on the project structure. The design must account for all attachments and appurtenances. The selected structural framing members must be sufficient to provide a load path for all load-bearing members to transfer design loads to the foundations. The design must also account for the connections required to transfer loads from one member to another in accordance with the design concept.

Assistance in evaluating flood mitigation techniques can be found in FEMA 551. Design and construction techniques for building foundations can be found in FEMA P-550, which describes in detail the considerations for determining the feasibility of constructing to the required height. Although FEMA P-550 was developed in response to the reconstruction needs after Hurricane Katrina, the design solutions provided can be used in both coastal and non-coastal flood zones.

The design process must also include any testing required to establish site-specific design parameters, such as soil borings conducted as part of a geotechnical exploration, to determine foundation requirements.

Prior to construction, each subapplicant must obtain all applicable permits and pay all required permitting fees. Applicable permits are expected to include, but not be limited to:

- Zoning or land use approvals.
- Environmental permits or required certifications.
- Historic preservation approvals.
- Building permits.

B.2.4.1.1. Plan Review and Inspections

Construction drawings and specifications must be reviewed by the local jurisdiction's building official prior to the start of construction.[428] If the local jurisdiction has not established a building department, the reviews must be conducted by an independent licensed design professional retained by the jurisdiction to conduct such reviews. The reviewing design professional must be licensed in the state in which the project is located. Payment for the reviewing design professional is an allowable cost. Construction inspections must be conducted to verify the project was constructed in full accordance with the approved design and the applicable International Codes. Construction inspections must be conducted by the office of the building official or under the direct supervision of a design professional licensed in the state where the project is located, as applicable.

B.2.4.1.2. Site Preparation

Site preparation activities include demolition of existing structures, removal and disposal of project debris, site environmental restoration, utility relocation and site grading required as part of the project. The subrecipient must conduct a Phase I environmental site assessment in accordance with the EPA's "all appropriate inquiries" rule and ASTM E2247.[429] A clean-site certification from the appropriate federal or state agency is required for properties that were subject to remedial, removal, response or corrective actions for hazardous materials. Environmental site remediation costs are not eligible.

B.2.4.2. Construction Activities

The following information covers the requirements for foundation construction, structural shell construction, interior finishes, construction completion, builder certification and certificate of occupancy.

B.2.4.2.1. Foundation Construction

Foundation construction activities include installation, monitoring and testing (if required) of foundations supporting the structure. Assistance in evaluating flood mitigation techniques can be found in FEMA 551. Design and construction techniques for building foundations can be found in FEMA P-550. FEMA P-550 describes in detail the considerations for determining the feasibility of constructing to the required height. Although FEMA P-550 was developed in response to the reconstruction needs after Hurricane Katrina, the design solutions provided can be used in both coastal and non-coastal flood zones. Additionally, NFIP Technical Bulletins can be used to meet floodplain management criteria for specific structures or geologic circumstances.

Installation of an open foundation system must be monitored to ensure the foundation elements are installed to the depth and achieve the load capacity specified in the construction documents.

[428] IBC, Section 104
[429] 40 CFR Part 312

Foundation construction monitoring can be conducted by a building official or their designee, the licensed design professional responsible for the project design, or an independent agency.

B.2.4.2.2. Structural Shell Construction

Structural shell construction activities include all framing, load-carrying elements, attachments and building envelope components above the foundation. Because rough-in installation of electrical, communications, plumbing and mechanical systems may require drilling through or making notches in load-carrying elements, such rough-in work is also part of the structural shell construction activities. Structural shell construction activities must include an inspection of the completed shell prior to interior work covering the framing. The engineering inspection must verify the size, location and materials used in the construction are in conformance with the construction drawings and the applicable International Codes.

The results of an engineering inspection by, or under the direct supervision of, the responsible licensed design professional or an independent agency must be presented in a written report signed and sealed by the licensed design professional in charge of the monitoring. The engineering inspections must be conducted by a building official or their designee. The licensed design professional responsible for the project design may inspect the structure for quality control reasons.

B.2.4.2.3. Interior Finishes

Interior finish activities include installation of interior walls, flooring, wiring/lighting fixtures, insulation, plumbing and mechanical fixtures, kitchen/bath counters, cabinets, sinks, toilets, tubs/showers, and heating, ventilation, and air conditioning. Inspections of these interior finishes must be conducted in accordance with the requirements of the applicable International Codes.

B.2.4.2.4. Builder Certification

At a minimum, all work must be performed by contractors licensed or registered in the state where they are working and who maintain appropriate insurance coverage. In addition, contractors must adhere to more stringent local requirements, where applicable.

B.2.4.2.5. Certificate of Occupancy

Projects assisted under this program shall not be occupied, or the occupancy category changed, without prior issuance of a certificate of occupancy by the governing local jurisdiction. In jurisdictions that have adopted the International Codes, the certificate of occupancy shall be issued only after the building official inspects the structure and finds no violations of the provisions of applicable codes or other laws enforced by the building department, as well as the provisions and requirements of the HMA Guide.

In the absence of an adopted building code in a participating jurisdiction, or the absence of a designated building official, the required inspections shall be conducted by or under the direct supervision of an appropriate design professional licensed in the state where the project is located. In communities that have not adopted the International Codes, the state building commission shall

determine the education, training, and experience requirements for inspectors responsible for conducting inspections.

Inspections required prior to the issuance of a certificate of occupancy include but are not limited to the following:

- Demolition inspection: Inspections shall be made after all utility connections have been disconnected and secured in such a manner that no unsafe or unsanitary conditions exist on the site during or after demolition operations.

- Foundation inspection: Inspections shall be made during foundation construction to verify the foundations have been installed to the depth and capacity specified in the construction documents.

- Floodplain inspection: Inspections must be made for properties located in the SFHA upon placement of the lowest floor and prior to subsequent vertical construction. Documentation of the elevation of the lowest floor must be provided by a land surveyor, engineer or architect authorized by law to certify elevation information in the state where the project is located. Handheld global positioning system (commonly known as GPS) -derived ground elevations are not acceptable to meet this requirement. In addition, setbacks and distances from water courses, the regulatory floodway, Zone V and the mapped limit of the 1.5-foot breaking wave zone must be checked prior to construction.

- Framing inspection: Inspections must be made after the roof is in place, including all framing and bracing, and after the plumbing, mechanical and electrical rough-ins are complete. The framing inspections must verify framing members are of the type, size and grade indicated on the construction documents and the connections and fasteners have been installed in accordance with the applicable codes and construction documents.

- Sheathing inspection: Inspections must be conducted after all roof and wall sheathing and fasteners are complete and, at a minimum, must include inspection of the roof sheathing, wall sheathing, sheathing fasteners and roof/wall dry-in.

- Final inspection: A final inspection must be completed to document compliance with all requirements of the International Codes, local floodplain ordinances and any other state or local regulations.

A comprehensive list of all required inspections, permits and certifications is included in the International Codes. Additional information on flood-related inspections, including sample checklists, can be found in the ICC/FEMA *Reducing Flood Losses through the International Codes: Coordinating Building Codes and Floodplain Management Regulations, 5th Edition* document (Oct. 2019).

B.2.4.3. Budget and Scope of Work Changes

Recipients are required to report deviations from budget, project scope or objectives in accordance with Part 8. Recipients must request prior approvals from FEMA for budget and program plan revisions.[430]

If the final design is not complete prior to award, once the project is awarded, the design must be finalized by a licensed design professional. Any changes to the scope of work or budget because of completing the final design or to address permitting requirements must be consistent with Part 8. Construction design activities are defined as construction activities; therefore, budget changes involving them must be consistent with Part 8.F.2.

B.2.5. MITIGATION RECONSTRUCTION: CLOSEOUT

Recipients and subrecipients must closeout projects in a timely manner consistent with Part 9.

In addition to the typical HMA program closeout processes, closeout of mitigation reconstruction projects generally includes the following:

- A certificate of occupancy and the *Elevation Certificate* (FEMA Form 086-0-33) for each structure in the subaward to certify the structure is code compliant and was elevated to the required elevation. FEMA will use the latest published edition of ASCE 24 or its equivalent as the minimum design criteria.
- A copy of a recorded deed for each structure, including requirements for maintenance and flood insurance requirements.
- A signed *Acknowledgement of Conditions for Properties Using FEMA Hazard Mitigation Assistance* form for each structure.
- A certification from a building official or licensed design professional verifying the structure was designed and constructed to the minimum standard of the two most recently published editions of the International Codes, even in locations where no code has been adopted.
- A front, rear and side photograph of the final structure, including the date of the photograph, structure address, latitude/longitude to the nearest sixth decimal place, source of photograph and name of the photographer.
- Verification by the recipient that final square footage is within 10% of original structure square footage at the time of closeout.
- Verification of flood insurance for each structure.

[430] 2 CFR § 200.308

- Update of the structure site information in the FEMA electronic application system for each structure.

B.2.6. MITIGATION RECONSTRUCTION: RESOURCES

Mitigation Reconstruction Resources

- FEMA BCA Toolkit: https://www.fema.gov/grants/guidance-tools/benefit-cost-analysis
- FEMA BCA webpage: https://www.fema.gov/grants/guidance-tools/benefit-cost-analysis
- FEMA EHP review job aids: https://www.fema.gov/grants/guidance-tools/environmental-historic/preparation-resources
- FEMA 551, *Selecting Appropriate Mitigation Measures for Floodprone Structures*: https://www.fema.gov/sites/default/files/2020-08/fema_551.pdf
- FEMA P-550, *Recommended Residential Construction for Coastal Areas: Building on Strong and Safe Foundations*: https://www.fema.gov/emergency-managers/risk-management/building-science/flood
- Overview of FEMA P-550: https://www.fema.gov/sites/default/files/2020-07/fema550_flyer_052219.pdf
- ASCE 24: https://ascelibrary.org/doi/book/10.1061/asce24
- Guidance for Applying ASCE 24 Engineering Standards to HMA Flood Retrofitting and Reconstruction Projects: https://www.fema.gov/emergency-managers/risk-management/building-science/flood
- International Residential Code for One- and Two-Family Dwellings: https://www.iccsafe.org/products-and-services/i-codes/2018-i-codes/irc/
- National Fire Protection Association 225, Model Manufactured Home Installation Standard: https://www.nfpa.org/codes-and-standards/all-codes-and-standards/list-of-codes-and-standards/detail?code=225
- FEMA P-85, *Protecting Manufactured Homes from Floods and Other Hazards*: https://www.fema.gov/sites/default/files/2020-08/fema_p85.pdf
- NFIP Technical Bulletins: https://www.fema.gov/emergency-managers/risk-management/building-science/national-flood-insurance-technical-bulletins
- International Code Council's Reducing Flood Losses through the International Codes: https://www.fema.gov/sites/default/files/2020-07/fema_reducing_flood_losses_rfl_5th-ed.pdf

B.3. Structure Elevation

B.3.1. STRUCTURE ELEVATION: OVERVIEW

Structure elevation activities generally involve physically raising an existing structure. Structure elevation may be achieved through various methods, including elevating on continuous foundation walls; elevating on open foundations, such as piles, piers, posts or columns; elevating on fill; and converting the second story. Foundations must be designed to properly address all loads and be appropriately connected to the floor structure above. Utilities must also be properly elevated. Buildings proposed for elevation must be structurally sound and capable of being elevated safely.

B.3.2. STRUCTURE ELEVATION: ELIGIBILITY

FEMA requires applicants and subapplicants to design all structure elevation projects in accordance with the NFIP standards in 44 CFR Part 60 and the latest published edition of ASCE 24 or its equivalent as minimum design criteria. The scope of work narrative should clearly state the structure elevation will be designed to meet ASCE 24 criteria. Structure elevations in the flood hazard area must follow HMA's Federal Flood Risk Management Standard requirements described in Part 4.I.

B.3.2.1. Eligibility Criteria

For a structure to be eligible for elevation, it must be structurally sound and capable of being elevated safely. Elevation projects must raise the lowest floor above the Base Flood Elevation or elevation required by FEMA, local ordinance or design flood elevation, whichever is highest.

In the case of an elevation project in a coastal flood zone, the lowest horizontal structural member must be raised above the Base Flood Elevation or elevation required by FEMA, local ordinance or design flood elevation, whichever is highest.

In cases where a building cannot be elevated, the ground floor living space can be filled in or repurposed and used solely for parking, storage or building access. The existing second floor is converted to the new living space or the roof is removed and additional living space is constructed over the existing living space. This project is called a second-story conversion. For second-story conversion projects, the bottom of the second story must be above the Base Flood Elevation or elevation required by FEMA (HMA's Federal Flood Risk Management Standard), local ordinance or design flood elevation, whichever is highest.

The property owner must voluntarily agree to participate in the elevation program. During the development of an elevation project, property owners are responsible for notifying the subapplicant of their interest in participating in the proposed project. They must provide all the information requested by the subapplicant, and they must finish all the actions required to complete the subapplication and to carry out the structure elevation.

B.3.2.2. Eligible Activities

Table 22 outlines structure elevation activities eligible under the following programs:

Table 22: Eligible Structure Elevation Activities

Eligible Activities	HMGP	HMGP Post Fire	BRIC	FMA
Elevating on continuous foundation walls	Yes	Yes	Yes	Yes
Elevating on open foundations (e.g., piles, posts, piers)	Yes	Yes	Yes	Yes
Elevating on fill	Yes	Yes	Yes	Yes
Second-story conversion	Yes	Yes	Yes	Yes

B.3.2.2.1. Design Considerations

Buildings proposed for structure elevation must be structurally sound and capable of being elevated safely. A report of an inspection completed by a qualified professional (e.g., licensed engineer or architect, local building code official) may be used to document the structural soundness. Important design considerations for structure elevations are as follows:

- Structure elevations in the flood hazard area must follow HMA's Federal Flood Risk Management Standard requirements described in Part 4.I.
- In cases where HMA's Federal Flood Risk Management Standard does not apply, elevation projects must meet requirements by the latest published edition of ASCE 24. FEMA also encourages consideration of future conditions, including sea level rise, when determining the elevation height and will assist elevations higher than the minimum requirements if they remain cost-effective. Upon completion of the elevation work, an *Elevation Certificate* (FEMA Form 086-0-33) verifying "as-built" elevations must be completed to ensure the structure complies with the local floodplain ordinance and NFIP floodplain management and HMA requirements.
- Sea level rise can be applied to projects in any U.S. coastal area where relative sea level rise data are available. This includes areas subject to coastal flooding as identified in the current NFIP flood study or coastal rivers and streams located as far inland as the extent of estimated tidal influence or storm surge. When performing structure elevation projects or projects that have freeboard requirements, sea level rise estimates should be added to the state or local jurisdiction's freeboard requirements if those freeboard requirements do not exceed the projected sea level rise during the project's useful life.
- Elevation projects must be designed and adequately anchored to prevent flotation, collapse and lateral movement of the structure due to hydrodynamic and hydrostatic loads, including

the effects of buoyancy. FEMA recommends that an engineer certify that the design elevation will withstand the depth and velocity of 1% annual chance flood events (hydrostatic and hydrodynamic loads), any potential increase in wind load or any other relevant load factors.

- For elevation projects in Zone V with open foundations (piles, piers, posts or columns), the space below the lowest floor must be free of obstructions or constructed with non-supporting breakaway walls, open wood latticework, or screening intended to collapse under wind and water loads without causing collapse, displacement or other structural damage to the elevated portion of the building or supporting foundation system. Guidance on free-of-obstruction and breakaway wall requirements is available in FEMA Technical Bulletin 5, *Free-of-Obstruction Requirements: For Buildings Located in Coastal High Hazard Areas in Accordance with the National Flood Insurance Program* (March 2020) and Technical Bulletin 9, *Design and Construction Guidance for Breakaway Walls: Below Elevated Located in Coastal High Hazard Areas in Accordance with the National Flood Insurance Program* (Sep. 2021).

- For elevation projects on continuous foundation walls with fully enclosed areas below the lowest floor, the area must be used solely for parking of vehicles, building access or storage.[431]

- Elevation projects on continuous foundation walls must be designed to equalize hydrostatic flood forces on exterior walls automatically by allowing for the entry and exit of floodwaters. Designs to meet these criteria must be certified by a licensed professional engineer or meet or exceed the criteria in 44 CFR § 60.3((5). Guidance on meeting this requirement can be found in NFIP Technical Bulletin 1 (TB-1), *Requirements for Flood Openings in Foundation Walls and Walls of Enclosures* (March 2020).

- Elevation projects on constructed fill must meet or exceed criteria in 44 CFR § 60.3(e)(6). Guidance on meeting these criteria can be found in FEMA Technical Bulletin 10-01, *Ensuring That Structures Built on Fill In or Near Special Flood Hazard Areas Are Reasonably Safe from Flooding* (May 2001).

- In Zone A, second-story conversions above the Base Flood Elevation are allowable. These projects involve converting the usage of the ground floor to parking, storage or building access and modifying or replacing the walls; filling below-grade areas and basements; or elevating the building. Additional information about second-story conversions is available in FEMA P-312, *Homeowner's Guide to Retrofitting: Six Ways to Protect Your Home From Flooding, 3rd Edition* (June 2014) and the *Second Story Conversion—Elevation Project Design Considerations for Hazard Mitigation Assistance Applicants* FEMA fact sheet.

[431] 44 CFR § 60.3(c)(5)

- Elevations of existing slab-on-grade foundations attached to existing buildings must only occur if the slab is certified by a licensed structural engineer to be usable as a structural slab (i.e., reinforced sufficiently to be self-supporting) and meets the design requirements of the latest International Code, ASCE standards, and the American Concrete Institute (ACI) *Building Code Requirements for Structural Concrete (ACI 318) and Commentary on Building Code Requirements for Structural Concrete (ACI 318R)*. If the slab is non-structural in nature, then an alternate foundation elevation method should be considered. Additional information is available in FEMA P-312.

B.3.2.3. Ineligible Activities

A general list of ineligible activities is included in Part 4.

Refer to Part 12.B.3.3.2.2 for specific activities that are considered ineligible for structure elevation projects. A general list of ineligible activities is included in Part 4

B.3.2.4. Cost-Effectiveness

Applicants and subapplicants must demonstrate that mitigation projects are cost-effective. Projects must be consistent with Part 5.

FEMA will fund hazard mitigation projects that include sea level rise estimates. To incorporate considerations for sea level rise in the development of a BCA, recipients and subrecipients should add the estimated sea level rise to the current 10%, 4%, 2% and 1% annual chance flood elevations for their area. Generally, sea level rise can be included in flood elevations when conducting BCAs in coastal areas using the full data flood module. Sea level rise can be applied to projects in any U.S. coastal area where relative sea level rise data are available. This includes areas subject to coastal flooding as identified in the current NFIP flood study or coastal rivers and streams located as far inland as the extent of estimated tidal influence or storm surge.

When performing structure elevation projects or projects that have freeboard requirements, sea level rise estimates should be added to the state or local jurisdiction's freeboard requirements if those freeboard requirements do not exceed the projected sea level rise during the project's useful life.

B.3.2.4.1. Pre-Calculated Benefits for Elevation

Based on extensive analysis, FEMA determined pre-calculated benefits for elevation projects located in the SFHA. This analysis demonstrates a national average for benefits of $205,000 for elevation projects. Therefore, FEMA has determined the elevation of a structure located in the 1% annual chance floodplain for which costs are equal to or less than $205,000 is cost-effective.

Alternatively, if a structure's Lowest Floor Elevation (Zone A) or lowest horizontal structural member (Zone V) is lower than the Base Flood Elevation, the pre-calculated benefit may be used even if the structure is not in a mapped SFHA. For projects that contain multiple structures, the average cost of all structures in the project must meet the stated criterion.

To qualify for these pre-calculated benefits, the applicant or subapplicant must include maps with each structure's footprint clearly identified and the SFHA delineated as part of the application. If a structure or any part of a structure lies in the 1% annual chance floodplain, the applicant or subapplicant can use the pre-calculated benefits for the structure.

If the applicant or subapplicant cannot clearly demonstrate a structure is in the SFHA, then the finished floor elevation and Base Flood Elevation should be included in the BCA for the structure. If the finished floor elevation is less than Base Flood Elevation, the applicant or subapplicant can use the pre-calculated benefits for the structure. No other detailed analysis will be required. These pre-calculated benefits can be used for both riverine and coastal areas.

Additionally, the specific geographic location of structures can greatly increase elevation costs. The benefits identified above may be adjusted by the recipient and subrecipient using locality multipliers included in industry-accepted cost and pricing guides for construction. If a multiplier is used, a copy of the source document must be included as part of the application for review and the methodology demonstrated for the increase of benefits. Also, the applicant or subapplicant should use the most up-to-date locality multiplier at the time of application.

For up-to-date information on the dollar value of pre-calculated benefits, visit the FEMA "Benefit-Cost Analysis" webpage.

B.3.2.5. Feasibility and Effectiveness

Projects must be consistent with Part 4. Mitigation projects assisted by HMA must be both feasible and effective at mitigating the risks of the hazard(s) for which the project was designed. A project's feasibility is demonstrated through conformance with accepted engineering practices, established codes, standards, modeling techniques or best practices.

B.3.2.5.1. Codes and Standards

For structure elevation, the subapplicant must include a statement from a local official certifying the community will retain a qualified licensed professional to design the project in conformance with latest published edition of ASCE 24 and will meet the feasibility and effectiveness requirements.

FEMA will use the latest published edition of ASCE 24 or its equivalent as the minimum design criteria for all HMA-assisted structure elevation projects in flood hazard areas. These flood hazard areas include floodways, coastal high-hazard areas and other high-risk flood hazard areas such as alluvial fans, flash flood areas, mudslide areas, erosion-prone areas and high-velocity areas. ASCE 24 addresses design and construction requirements for new buildings and Substantial Improvements to existing buildings (including repair of substantial damage) located, in whole or in part, in flood hazard. ASCE 24 sets forth requirements for elevation, foundation designs, enclosures below elevated buildings, materials, wet and dry floodproofing, utility installations, building access and miscellaneous structures (e.g., decks, porches, patios, garages, chimneys and fireplaces, pools and above- and below-ground storage tanks).

In addition, all elevation projects in flood hazard areas must also comply with the requirements established by the Federal Flood Risk Management Standard, conform to local floodplain regulations, and be permitted by the local floodplain administrator. [432] Refer to Part 4.I for more information about these requirements.

B.3.2.6. Environmental and Historic Preservation

All subapplications submitted to FEMA must meet the EHP criteria in Part 4. All subapplications must provide the information described in Part 6 so that FEMA may perform the EHP review.

B.3.2.7. National Flood Insurance Program Eligibility Requirements

Mitigation projects sited within the SFHA are eligible only if the jurisdiction is participating in the NFIP. For FMA only, all properties included in a subapplication must be NFIP-insured at the time of the opening of the application period. The flood insurance policy must be maintained throughout the period of performance and for the life of the structure. For more information, refer to Part 4.J.

B.3.2.8. Special Flood Hazard Area Requirements

For structures in the SFHA at the completion of the project and all structures receiving FMA regardless of location in the SFHA, flood insurance must be maintained for the life of the property.[433] For more information, refer to Part 4.J.

B.3.3. STRUCTURE ELEVATION: APPLICATION AND SUBMISSION INFORMATION

All subapplications submitted to FEMA must meet the eligibility criteria in Part 4. All subapplications must have a scoping narrative in accordance with Part 6. Project-specific criteria are highlighted below.

FEMA may request additional information after the subapplication has been submitted to ensure all necessary information is received. However, all information required by the regulations and the HMA Guide must be received before an assistance decision and award or final approval can be made.

For structure elevation projects, the subapplication must include the following for each structure:

- Physical address and property owner(’s) name(s).
- Longitude and latitude coordinates to the nearest sixth decimal place.
- Clear color photographs of each side of the building to be elevated.

[432] 44 CFR § 60.3
[433] 42 U.S.C. § 4012a(a)

- Color photographs of the surrounding neighborhood taken from the site of the building to be elevated.
- Estimated cost to elevate each structure.
- Name and location of flooding source (e.g., creek, river, watershed or location of stormwater ponding) and location of the property on the applicable FIRM.
- The proposed elevation of the lowest finished floor for each structure to be mitigated, the Base Flood Elevation and the current elevation of the lowest finished floor. If future conditions are being considered, documentation that supports those conditions and their impacts on the elevation must be included.
- Type of existing foundation (slab-on-grade, crawl space, basement or open foundation) and the proposed elevation method and standard to be used.
- Statement that the project will be designed in compliance with NFIP standards in 44 CFR § 60.3.
- Schedule showing anticipated start and completion dates, significant milestones, activities and deliverables.

B.3.3.1. Budget

All subapplications must include a line-item breakdown of all anticipated costs.

Subapplicants may apply for subrecipient management costs to cover administrative costs. Management costs must be included in the subapplication budget as a separate line item. More information about the requirements for management cost requests can be found in Part 13.

B.3.3.2. Costs

B.3.3.2.1. Eligible Structure Elevation Costs

Allowable costs are costs that are necessary and reasonable for the proper and efficient performance and administration of the federal award. The following costs associated with structure elevation projects are generally allowable:

- Engineering services for design, structural feasibility analysis and budget preparation.
- Surveying, soil sampling, completion of *Elevation Certificate* (FEMA Form 086-0-33), title search, deed recordation fees, legal and/or permitting fees, project administration and construction management.
- Disconnection of all utilities.

- Building of a foundation so that the lowest floor is at the Base Flood Elevation or higher if required by local ordinance or FEMA.
- Physical elevation of the structure and subsequent lowering and attachment of the structure onto a new foundation.
- Construction of a floor system that meets minimum building code requirements when the existing floor system cannot be elevated or is not appropriate for the new foundation.
- Reconnecting utilities and extending lines and pipes as necessary and elevating all utilities and service equipment.
- Debris disposal and erosion control.
- Repair of lawns, landscaping, sidewalks and driveways if damaged by elevation activities.
- Construction of a utility room above the Base Flood Elevation only if there is no existing space within the house for this purpose or there is no alternative cost-effective way to elevate the utilities.
- Elevation of existing decks, porches or stairs.
- Construction of new stairs, landings and railings to access the elevated living space per minimum code or local ordinance.
- Construction of ADA-compliant access facilities or ramps when an owner or a member of the owner's family has a permanent disability and a physician's written certification. An ADA-compliant access to ingress/egress is allowable for assistance unless specified otherwise in applicable state or local codes. If ramps are not technically feasible, a mechanical chair lift may be installed.
- Documented reasonable living expenses (except food and personal transportation) that are incurred while the owner is displaced by the elevation construction.
- Abatement of asbestos and lead-based paint.
- Filling basements with compacted clean fill.

B.3.3.2.2. Ineligible Structure Elevation Costs

Certain structure elevation activities and their associated costs are not eligible. Ineligible costs for structure elevation include but are not limited to the following:

- Elevating structures that were not in compliance with current NFIP standards at the time of construction.

- Costs related to building additions or auxiliary structures.[434]
- Construction of new decks or porches.
- Any improvements for purely aesthetic reasons, unless required by the EHP compliance review.
- Costs to replace or repair utility service components that are undersized, inadequately designed or unsafe, unless required by code (except utility rooms noted as eligible costs).
- Exterior finish on the exposed foundation of the elevated building, unless required by EHP compliance review and or local code.
- Additional landscaping for ornamentation beyond what existed on the site prior to construction of the project (e.g., trees, shrubs).

B.3.4. STRUCTURE ELEVATION: SUBAWARD IMPLEMENTATION

Elevation project implementation entails:

- Pre-construction activities.
- Construction.
- Inspection of the completed foundation and engineering certification.
- Obtaining an *Elevation Certificate* (FEMA Form 086-0-33) and certificate of occupancy.
- A recordation of deed restriction requirements for property maintenance and flood insurance.

Before the construction of the foundation begins, it is very important to conduct an inspection of the condition of the structure, survey the site and complete a soil inspection to ensure the proposed elevation project is feasible on the site.

B.3.4.1. Elevation Methods

Standard structure elevation methods are identified in FEMA P-312; FEMA P-347, *Above the Flood: Elevating your Floodprone House*; and the *Second-Story Conversion* FEMA fact sheet. In addition, FEMA has developed guidance for the design of appropriate foundations based on the requirements of the International Codes and other applicable standards. That guidance is provided in FEMA P-550, *Recommended Residential Construction for Coastal Areas: Building on Strong and Safe Foundations, Second Edition* (Dec. 2009), and is available for use with HMA structure elevation projects. FEMA also requires applicants and subapplicants to design all structure elevation projects

[434] "Auxiliary structure" is a garage, storage or other space/structure not used as a living/dwelling space. Building additions are defined by code as "an extension or increase in the floor area, or height of a building or structure."

in accordance with the latest published edition of ASCE 24 and requirements established by the Federal Flood Risk Management Standard as described in Part 4.I.

Available elevation methods, thoroughly described in FEMA P-312, FEMA P-347 and the *Second-Story Conversion* FEMA fact sheet include:

- Elevating the existing structure on piles, posts or piers.
- Elevating the structure on fill.
- Filling in the basement and replacing it with an elevated floor.
- Elevating by vertically extending the foundation walls of the home.

Activities that result in the construction of new living space at or above the Base Flood Elevation are considered only when they are consistent with mitigation reconstruction requirements. Activities include structure elevations that abandon a lower enclosed area and add a second story above the Base Flood Elevation to an existing structure.

The method that is selected for elevating a house depends on factors such as:

- Foundation type—the most common foundation types are:
  - Crawl space on foundation walls.
  - Slab-on-grade.
  - Open type foundation—piles and posts or piers.
- Condition of the house.
- Applicable state and local building codes.
- Soil type and bearing capacity.
- Weight of the house and lateral forces on the house from water and other natural hazards, such as winds and earthquakes.
- Height of proposed elevation above the grade level.
- Number of additions to the original structure.

Additional information can be found in the resources on the FEMA "Building Science" webpage.

B.3.4.2. Survey and Inspection Considerations

FEMA encourages surveying and inspections throughout the construction process. Certifications of the surveys ensure the work has been performed in compliance with the structure-specific plans and specifications, applicable codes and standards, and minimum NFIP requirements. Figure 15 identifies important inspection and survey considerations.

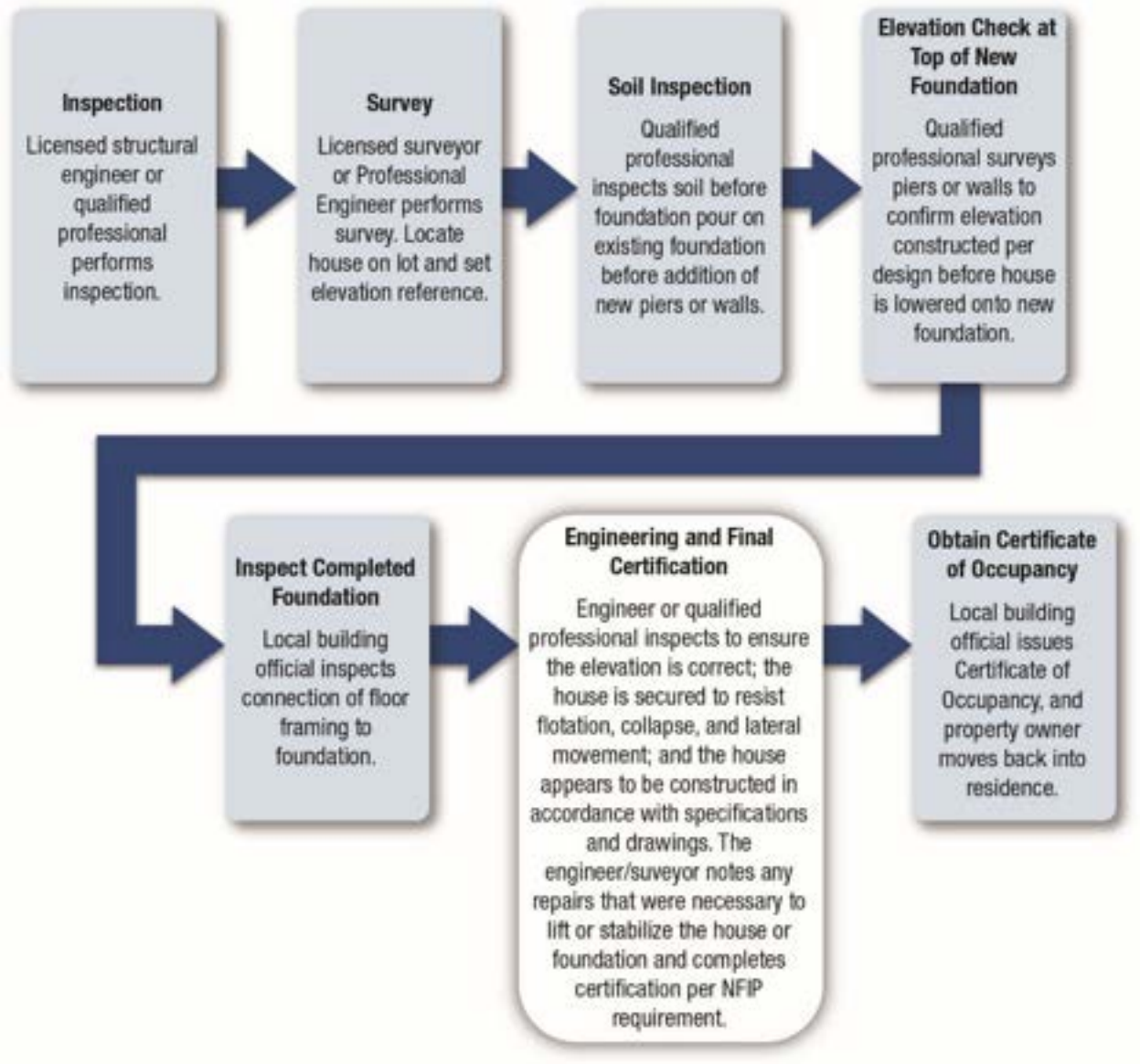

Figure 15. Inspection and Survey Considerations

B.3.4.3. Budget and Scope of Work Changes

Recipients are required to report deviations from budget, project scope or objectives in accordance with Part 8. Recipients must request prior approvals from FEMA for budget and program plan revisions.[435]

If the results of inspections indicate the structure cannot be elevated, the subapplicant may request a change in scope to substitute another structure. This option is only available if alternative structures were identified in the original subapplication. If the final design is not complete prior to award, once the project is awarded, the design must be finalized by a licensed design professional. Any changes to the scope of work or budget because of completing the final design or to address permitting requirements must be consistent with Part 8. Construction design activities are defined as construction activities; therefore, budget changes involving them must be consistent with Part 8.F.2.

B.3.5. STRUCTURE ELEVATION: CLOSEOUT

Recipients and subrecipients must close out projects in a timely manner consistent with Part 9.

In addition to the typical HMA program closeout procedures, close out of structural elevation projects generally includes:

- A certificate of occupancy and the final *Elevation Certificate* (FEMA Form 086-0-33) for each structure on the project to certify the structure is code compliant and was elevated to the required elevation.
- A copy of the recorded deed for each property, including structure elevation project deed requirements for property maintenance and flood insurance requirements.
- A signed *Acknowledgement of Conditions for Properties Using FEMA Hazard Mitigation Assistance* form for each structure.
- A certification from a building official or licensed design professional verifying that the structure was designed and constructed to the minimum standard of the two most recently published editions of the International Codes, even in locations where no code has been adopted.
- Front, rear and side photographs of the final structure(s), including the date of the photograph, property address, latitude/longitude to the nearest sixth decimal place and the source of the photograph.
- Verification of flood insurance policy for each structure.

[435] 2 CFR § 200.308

- Update of the property site information and address in the respective HMA electronic system database for each structure indicating if each property was mitigated or withdrawn.

B.3.6. STRUCTURE ELEVATION: RESOURCES

Structure Elevation Resources

- FEMA BCA webpage: https://www.fema.gov/grants/guidance-tools/benefit-cost-analysis
- EHP Review job aids: https://www.fema.gov/grants/guidance-tools/environmental-historic/preparation-resources
- *Elevation Certificate* (FEMA Form 086-0-33): https://www.fema.gov/sites/default/files/2020-07/fema_nfip_elevation-certificate-form_feb-2020.pdf
- NFIP TB 5, *Free-of-Obstruction Requirements*: https://www.fema.gov/sites/default/files/documents/fema_free-of-obstruction-technical-bulletin_2021052721.pdf
- NFIP TB-9, *Design and Construction Guidance for Breakaway Walls Below Elevated Coastal Buildings*: https://www.fema.gov/sites/default/files/documents/fema_nfip-technical-bulletin-9-09292021.pdf
- NFIP TB-1, *Requirements for Flood Openings in Foundation Walls and Walls of Enclosures*: https://www.fema.gov/sites/default/files/documents/fema_flood-openings-technical-bulletin_20210607.pdf
- TB-10, *Ensuring That Structures Built on Fill In or Near Special Flood Hazard Areas Are Reasonably Safe From Flooding*: https://www.fema.gov/sites/default/files/2020-07/tb10_ensuring_structures_built_on_fillin_near_special_flood_hazard_areas_reasonably_safe_flooding_01_.pdf
- FEMA P-312, *Homeowner's Guide to Retrofitting*: https://www.fema.gov/sites/default/files/2020-07/fema_nfip_homeowners-guide-retrofitting_2014.pdf
- *Second-Story Conversion: Elevation Project Design Considerations for Hazard Mitigation Assistance Applicants* FEMA fact sheet: https://www.fema.gov/sites/default/files/2020-09/fema_second-story_conversion_elevation_fact_sheet_02-14-19.pdf
- FEMA P-347, *Above the Flood: Elevating Your Floodprone House*: https://www.fema.gov/pdf/library/fema347_toc.pdf
- FEMA P-550, *Recommended Residential Construction for Coastal Areas*: https://www.fema.gov/sites/default/files/documents/fema_p550-recommended-residential-construction-coastal-areas.pdf

- ASCE 24 *Flood-Resistant Design and Construction*: https://www.fema.gov/sites/default/files/2020-07/asce24-14_highlights_jan2015.pdf
- FEMA P-55, *Coastal Construction Manual Vol. 1*: https://www.fema.gov/sites/default/files/2020-08/fema55_voli_combined.pdf
- FEMA P-55, *Coastal Construction Manual Vol. 2*: fema55_volii_combined_rev.pdf
- FEMA P-259, *Engineering Principles and Practices for Retrofitting Flood-Prone Residential Structures*: https://www.fema.gov/sites/default/files/2020-08/fema259_complete_rev.pdf
- FEMA P-499, *Home Builder's Guide to Coastal Construction*: https://www.fema.gov/sites/default/files/2020-08/fema499_2010_edition.pdf
- Additional Building Science Publications: http://www.fema.gov/building-science-publications

B.4. Stabilization

B.4.1. STABILIZATION: OVERVIEW

Stabilization is a project type that reduces or prevents slope failure or ground movement, of a relatively limited extent, that transports earthen debris downhill by sliding, rolling, falling or slumping. Slope failures can involve rock falls and/or debris flow (a mixture of soil, rocks and vegetation) that deposit material at the base of a slope or a slip-out where a portion of a facility fails and falls to a descending slope. Slope failures can occur in either natural ground or human-made fill, such as a highway embankment or canyon fill.

B.4.2. STABILIZATION: ELIGIBILITY

The following information highlights eligible activities under the stabilization project type. These activities are not comprehensive, and FEMA encourages applicants and subapplicants to explore innovative ways to stabilize soil. Stabilization projects are eligible under HMGP, HMGP Post Fire, BRIC and FMA.

B.4.2.1. Stabilization Eligible Activities

Under HMA programs, proposed stabilization projects must meet program eligibility requirements, including mitigation of potential structure or infrastructure damage.

Stabilization is an eligible activity that involves projects that reduce risk to structures or infrastructure from erosion and landslides, including installing geosynthetics, surface and subsurface drainage, stabilizing sod, and vegetative buffer strips; preserving mature vegetation; decreasing slope angles; and stabilizing with riprap and other means of slope anchoring. These projects must not duplicate the activities of other federal agencies.

Stabilization can take place in environments ranging from shorelines and streambanks to mountainsides and hillsides, and can be used to mitigate erosion, landslides and avalanches. Stabilization mitigation techniques consist of two main categories: traditional "hard" techniques and nature-based/bioengineered techniques.

Examples of eligible stabilization activities are provided in Table 23.

Table 23: Examples of Eligible Stabilization Activities

Activity	Subactivity	HMGP	HMGP Post Fire	BRIC	FMA
Traditional hard/gray and hybrid techniques	Mechanically stabilized earth	Yes	Yes	Yes	Yes
	Soldier pile walls	Yes	Yes	Yes	No
	Gabion walls	Yes	Yes	Yes	Yes

Activity	Subactivity	HMGP	HMGP Post Fire	BRIC	FMA
	Crib walls and bin walls	Yes	Yes	Yes	Yes
Nature-based green technique Streambank stabilization	Fascines/stakes (e.g., live fascines, pole stakes and post plantings)	Yes	Yes	Yes	Yes
	Blankets/mats (e.g., erosion control blanket, live brush mattress, turf reinforcement mat, vegetated gabion mattress, coconut fiber rolls and toe stabilization/revetments)	Yes	Yes	Yes	Yes
	Stone-filled trenches (e.g., vegetated riprap, rootwad revetment, live siltation/tree revetment, trench fill revetment and longitudinal peak stone toe protections)	Yes	Yes	Yes	Yes
	Drainage-promoting measures (e.g., chimney drainage, slope drain and trench drain)	Yes	Yes	Yes	No
	Structural measures (e.g., geocellular containment system, live cribwalls, vegetated articulated concrete blocks, vegetated gabion basket and vegetated mechanically stabilized earth)	Yes	Yes	Yes	Yes
	Large woody debris	Yes	Yes	Yes	No
	Weirs and in-stream structures	Yes	Yes	Yes	No
	Bendway weir	Yes	Yes	Yes	No
	Diversion dike	Yes	Yes	Yes	No
	Engineered log jam	Yes	Yes	Yes	No
	Rock/cross vane	Yes	Yes	Yes	No
Shoreline stabilization	Beach/dune stabilization (e.g., beach nourishment, dune nourishment and plant beach/dune grass)	Yes	Yes	Yes	Yes
	Drainage (e.g., chimney drain, slope drain, trench drain and berm)	Yes	Yes	Yes	No
	Streambank regrading/stabilization (e.g., regrade bank, control runoff, install coir rolls and natural fiber blankets and plant native vegetation)	Yes	Yes	Yes	Yes

Activity	Subactivity	HMGP	HMGP Post Fire	BRIC	FMA
	Revetment (e.g., regrade slope, revetment and plant native vegetation)	Yes	Yes	Yes	Yes
	Marsh restoration (e.g., regrading fill, plant native vegetation, edging, sills, breakwater, reef balls, bulkhead, artificial beach, oyster bag/mat and thin layer placement)	Yes	Yes	Yes	Yes
Post-Wildfire	Mulching	Yes	Yes	Yes	No
	Erosion control mats or blankets	Yes	Yes	Yes	No
	Log terraces	Yes	Yes	Yes	No
	Fiber rolls	Yes	Yes	Yes	No
	Hydroseeding	Yes	Yes	Yes	No
	Silt fences	Yes	Yes	Yes	No
Other	Excavation (e.g., removing material and replacing with fill, benching or terracing a slope and reshaping ground surface)	Yes	Yes	Yes	Yes
	Reinforcement (e.g., geosynthetics, toe buttress or berm, deep soil mixing and soil nailing)	Yes	Yes	Yes	Yes
	Drainage (e.g., interceptor trench, horizontal drains and check dams)	Yes	Yes	Yes	No

B.4.2.1.1. Traditional or Gray and Hybrid Techniques

Traditional measures to stabilize soils often involve the installation of retaining walls. Retaining walls are relatively rigid structures that can be used to strengthen soil and increase resistance to sliding forces in areas where space is limited, such as areas where rights-of-way are restricted. They can also be used to create additional space (e.g., road shoulders or parking areas). Hybrid walls combine wall types and may include both gray and green elements. Examples of hard components or hybrid measures include:

- **Mechanically stabilized earth**: Mechanically stabilized earth walls are constructed using compacted granular soil fill and geotextiles placed in alternating layers to construct a steepened slope that then may have a wall facing applied.
- **Soldier pile walls**: Soldier pile walls use a system of steel piles driven at regular intervals (usually 6 to 12 feet) and horizontal members, called lagging, placed horizontally between

the piles to retain the soil behind the planks. Soldier pile walls provide stability by resisting the lateral forces of the soil behind the wall.

- **Gabion walls**: A gabion is a wire cage filled with rocks, concrete pieces, gravel or bricks. A bastion is a gabion that is lined with a geotextile and filled with sand. Gabion walls provide stability by resisting lateral forces behind them. Because gabion walls typically are filled with rocks, they are freely draining and do not allow a buildup of water behind the wall.
- **Crib walls and bin walls**: A crib wall is a gravity wall system consisting of stacked members that are filled with soil or rock. Bin walls are like crib walls except interlocking bins are stacked on top of each other.

B.4.2.1.2. Nature-Based Green Techniques/Bioengineered Stabilization

Nature-based and bioengineered stabilization techniques use native vegetation and other suitable plant species with structural components to stabilize and reduce erosion to stabilize soil. These techniques can often be used in conjunction with hard or gray stabilization measures in hybrid approaches. The following sections highlight three nature-based/bioengineered stabilization eligible activities for streambank, shoreline and post-wildfire mitigation. These eligible activities do not represent an exhaustive list, but rather serve to highlight more common nature-based/bioengineered stabilization activities.

B.4.2.1.3. Coastal Barrier Resources System Eligibility Requirements

In accordance with the Coastal Barrier Resources Act,[436] HMA programs may assist projects in Otherwise Protected Areas if they do not require flood insurance after project completion.[437] Projects in a John H. Chafee Coastal Barrier Resources System (CBRS) unit are eligible only if they qualify for one of the exceptions in Section 6 of the Coastal Barrier Resources Act.[438] That is, projects are eligible if they are consistent with the purposes of the Coastal Barrier Resources Act and qualify as projects for the study, management, protection and enhancement of fish and wildlife resources and habitats.[439]

[436] Public Law 97-348 (Oct. 18, 1982), as amended. To remove federal incentives to develop coastal areas, the Coastal Barrier Resources Act designated relatively undeveloped land along the Atlantic and Gulf Coast as part of the John H. Chafee Coastal Barrier Resources System (CBRS) and made these areas ineligible for most new federal assistance.
[437] Congress reauthorized the Coastal Barrier Resources Act with the Coastal Barrier Improvement Act of 1990 (Public Law 101-591 [Nov. 16, 1990], expanding the CBRS to include undeveloped costal barriers along the Florida Keys, Great Lakes, Puerto Rico and the U.S. Virgin Islands. It also added a new category of undeveloped barriers called Otherwise Protected Areas. Otherwise Protected Areas consist of conservation or recreation areas such as national wildlife refuges, state and national parks, local conservation areas and private conservation areas, although they may also contain private areas not for conservation.
[438] 16 United States Code (U.S.C.) § 3505
[439] 16 U.S.C. § 3505(a)(6)(A), 44 CFR § 206.345

- All projects that occur in or adjacent to CBRS units must meet one of the Coastal Barrier Resources Act exceptions and require that FEMA consult with the appropriate U.S. Fish and Wildlife Service Ecological Services field office.

- Proposed actions carried out within or adjacent to an Otherwise Protected Areas do not require consultation with the U.S. Fish and Wildlife Service.

B.4.2.1.3.1. STREAMBANK STABILIZATION ELIGIBLE ACTIVITIES

Proposed bank stabilization projects must mitigate potential structure or infrastructure damage to meet eligibility requirements.

FEMA encourages project teams to coordinate with EHP or HMA staff to determine what data is needed to evaluate the project. The subapplicant should collect and review watershed data, hydrologic and hydraulic data, stream characteristics, soil and geotechnical data, fluvial geomorphic data, climatic and vegetative conditions, habitat characteristics (current and desired), and water quality and pertinent environmental data (current and desired). Important design considerations include site accessibility, channel grade, watershed flows, channel velocities, stream alignment, stream type/geometry, bed material and sediment load, and debris and maintenance needs.

Bioengineering approaches provide a self-stabilizing, long-term solution for many streams and banks damaged by erosion resulting from weather-related factors, construction and wildfires. The underlying principle requires the application of an integrated watershed-based approach that uses sound engineering practices together with ecological principles to assess, design, construct and maintain living vegetative systems. Bioengineering can be used on streambanks that require structural intervention to facilitate the growth of natural vegetation. Once the root system of the vegetation is established, it provides additional stream and bank stability. Successful projects can help repair damage caused by erosion and slope failures; protect or enhance already healthy, functioning systems; and ensure the long-term sustainability of the impaired area.

Measures may include but are not limited to the following categories:

- Fascines/stakes: Cuttings placed perpendicular to the ground or in trenches to improve slope and bank stability; project owners should work with appropriate local agencies to identify which plants to use.

    - Live fascines: Long branch cuttings bundled and placed in a shallow trench to stabilize streambanks and slopes.

    - Pole stakes: Cuttings from native species are embedded perpendicular to the ground in rows.

    - Post plantings: Large diameter cuttings (typically from a cottonwood or willow tree) are planted perpendicular to the ground surface, often among riprap.

- **Blankets/mats**: Protective layer of fiber, live cuttings or synthetic material placed on slopes for erosion protection.
    - Erosion control blanket: Flexible fiber mats placed over a geosynthetic netting down a slope.
    - Live brush mattress: Thick blanket of live brushy willow cuttings and soils.
    - Turf reinforcement mat: Rolled mat of non-degradable synthetic material that provides a matrix to reinforce the root system of vegetation for erosion protection.
    - Vegetated gabion mattress: Shallow rectangular containers 20 inches to 60 inches deep made of welded wire mesh and filled with rock and substrate to support vegetation.
    - Coconut fiber rolls: Manufactured, elongated cylindrical structures placed at the bottom of streambanks to help prevent scour and erosion in streams with low to moderate velocities (approximately 2.5 to 7 feet per second).
    - Toe stabilization/revetments: Structures or material, such as riprap, placed at the base of a slope to provide resistance against sliding material on a slope or embankment. In streams, these materials also reduce energy from moving water to decrease the likelihood of scour and erosion.
- **Stone-filled trenches**: Rock-filled trenches placed at the base of a stream bank capable of supporting substrate for vegetation.
    - Vegetated riprap: A layer of stone and/or boulder armoring that is vegetated, optimally during construction, using pole planting, brush layering or live-staking techniques.
    - Rootwad revetment: Structures constructed from interlocking tree materials, primarily intended to resist erosive flows and usually used on the outer bends of streams.
    - Live siltation/tree revetment: A revegetation technique in which cut trees are anchored along the stream bank to secure the toe of the stream bank, trap sediments and create a fish rearing habitat.
    - Trench fill revetment: Constructed by excavating a trench along the top of the bank, placing stone riprap in the trench, and filling the trench with native soil capable of supporting vegetation.
    - Longitudinal peak stone toe protection: A row of well-graded stones is placed parallel to the bank along its toe/base to protect against erosion and scour. The top of the stone is a third to half the bank height and the cross section of the row is triangular. Live poles can be staked among the stones in lower flow velocity environments.

- **Drainage-promoting measures**: Free-draining material placed on a slope or bank to intercept and control runoff and seepage to ensure long-term stability.
    - Chimney drainage: A subsurface drainage course placed between a natural slope and an earthen buttress fill or other retaining structure.
    - Slope drain: A drainage system used to collect and transport storm runoff down the face of a slope.
    - Trench drain: A drainage trench excavated parallel to and just behind the crest of a stream bank.
- **Structural measures**: Large retaining structures used to stabilize banks and slopes.
    - Geocellular containment system: Flexible, three-dimensional, high-density polyethylene, honeycomb-shaped earth-retaining structures; can be expanded/backfilled with a variety of materials to mechanically stabilize banks and slopes when applied.
    - Live cribwalls: A gravity-retaining structure consisting of a hollow, box-like interlocking arrangement of structural beams filled with soil and live cuttings.
    - Vegetated articulated concrete blocks: An articulated concrete block system consisting of durable concrete blocks placed together to form a matrix overlay or armor layer while allowing vegetation to grow throughout the system.
    - Vegetated gabion basket: Rectangular containers fabricated from a heavily galvanized steel wire or triple twisted hexagonal mesh. Vegetation is incorporated into rock gabions by placing live branches on each consecutive layer between the rock-filled baskets.
    - Vegetated mechanically stabilized earth: Live cut branches interspersed between lifts of soil wrapped in natural fabric.
- **Weirs and in-stream structures**: Structures that extend into the stream to direct flows away from banks to reduce erosion.
- **Large woody debris**: Structures made from felled trees (can include rootwads) to deflect erosive flows and promote sediment deposit at the base of eroding banks.
- **Bendway weir**: Discontinuous, redirective structures usually constructed of rock, designed to capture and then safely direct the flow through a meander bend; incorporating naturally occurring vegetation enhances aquatic and terrestrial ecosystems.
- **Diversion dike**: A low berm (or ditch/berm combination) constructed along the crest/top of a streambank.

- **Engineered log jam**: Structures made from felled trees may be used to deflect erosive flows and promote sediment deposition at the base of eroding banks.

- **Rock/cross vane**: Structures angled into the flow to reduce local bank erosion by redirecting flow from the near bank to the center of the channel; vegetation planted on nearby streambanks provides long-term stability.

B.4.2.1.3.2. SHORELINE STABILIZATION ELIGIBLE ACTIVITIES

Proposed shoreline stabilization projects must mitigate potential structure or infrastructure damage to meet eligibility requirements. Projects that return a shoreline to previous or pre-disaster conditions without an increase to the level of protection are not eligible.

The subapplicant must, at a minimum, collect and review data and photographs to characterize the project site based on hydrodynamics, morpho dynamics, sediment dynamics, anthropogenic factors, local ecology and water quality, and pertinent environmental data, as described below:

- Hydrodynamics describe the movement of water at the site by processes such as waves, tides and wind-induced currents as well as hydrological processes such as rainfall, infiltration and runoff.

- Morpho dynamics describe the shape and movement of the land's surface at the site over time. Site orientation, fetch, bathymetry (measurement of depth of water in oceans, seas or lakes), and topography as well as bluff erosion and shoreline change rates are all important morpho dynamics data that should be considered.

- Sediment dynamics describe the movement of sediment, caused by the interaction of wind, water and local topography with individual sediment particles. Important information includes soil composition, sediment grain size distribution and the geotechnical properties of soil at the site.

- Anthropogenic factors include all human-induced impacts at the site. Examples include existing coastal structures (e.g., bulkheads, docks), commercial (e.g., dredging, shipping), recreational (e.g., powerboating, fishing), and fisheries and agricultural (e.g., commercially harvested oyster beds, aquaculture facilities).

- Ecology describes the naturally occurring and interdependent communities of plant, animal and microbial species occurring at the site, and the conditions they depend on. Important information includes common species of local grasses and seagrasses as well as listed threatened and endangered species relying on coastal habitats in the area.

Important design considerations include site accessibility, site grade and orientation, watershed flows, longshore currents, fetch (length of open water over which wind from a given direction can travel to create waves), bed material properties, sediment sources/sinks, debris and maintenance needs, and environmental and historical preservation.

Stabilization methods use living and non-living plant materials together with natural and synthetic construction materials to reduce coastal erosion, establish vegetation and stabilize shorelines. Successful projects can help repair damage caused by erosion and slope failures; protect or enhance already healthy, functioning systems; and ensure long-term sustainability of the impaired shoreline and coastal habitat areas. Commonly used bioengineered shoreline stabilization measures generally focus on reducing wave impacts, mitigating storm surge, minimizing erosion, improving slope stability and/or creating or improving coastal habitat. FEMA will not approve projects that include only sand/sediment placement as a risk reduction measure without accompanying stabilization measures. FEMA encourages the use of nature-based solutions for all shoreline stabilization measures.

Measures may include but are not limited to the following categories:

- **Beach/Dune Stabilization:**
  - Beach nourishment: Sediment of compatible type (mean grain size and material) is placed on the beach to widen it and add sediment to the shoreline system. Beach nourishment may only be used in combination with other stabilization measures.
  - Dune nourishment: Sediment of compatible type (mean grain size and material) is used to reinforce an eroded dune face or in some cases to create a new dune. Dune nourishment may only be used in combination with other stabilization measures.
  - Beach/dune grass plantings: Native, deep-rooted beach grasses are planted on the dune and upper beach to stabilize added sediment and trap additional sediment.
- **Drainage:**
  - Chimney drain: A subsurface drainage course placed between a natural slope and an earthen buttress fill or other retaining structure.
  - Slope drain: A drainage system used to collect and transport stormwater runoff down the face of a slope.
  - Trench drain: A drain excavated parallel to and just behind the crest of a coastal bank.
  - Berm: An earthen mound placed at the top of a coastal bank to direct runoff away from the bank fence.
- **Streambank regrading/stabilization:**
  - Regrade bank: Eroding bank face that is unstable and over steepened is stabilized by reducing the slope. Placing fill at the bank toe and retreating the bank crest are two options.

- Control runoff: Surface runoff is diverted away from the eroding bank face by creating a berm at the bank crest and/or by installing drywells/French drains to encourage infiltration.

- Install coir rolls and natural fiber blankets: Blankets made of natural biodegradable fiber are rolled out onto the bank face to temporarily control erosion. Coir rolls, which are dense rolls anywhere from 6 inches to 12 inches in diameter and made of coconut husks, are placed parallel to the bank toe and up the toe face to provide protection from short-term erosion events such as storms. Native, deep-rooted vegetation is planted through the natural fiber components into the bank face.

- Plant native vegetation: Over time, the vegetation will become established and stabilize the bank as the natural fiber components degrade.

- **Revetment:**

  - Regrade slope: Flexible, three-dimensional, high-density polyethylene, honeycomb-shaped earth-retaining structures are installed; they can be expanded/backfilled with a variety of materials to mechanically stabilize surfaces.

  - Revetment: Sloped structure placed at the toe and/or face of a coastal bank to dissipate wave energy and reduce erosion; in coastal engineering these are usually made of riprap. Composed of natural materials but not inherently a bioengineering solution.

  - Plant native vegetation: Native vegetation planted on the slope above a revetment as well as within the spaces between rocks in a revetment's face can increase stability and create habitat.

- **Marsh restoration:**

  - Regrading fill: Unstable slopes are brought to a lower grade; sediment appropriate for supporting marsh vegetation is introduced if it does not exist.

  - Plant native vegetation: Appropriate native marsh vegetation is planted along the future marsh platform. In areas of very low wave energy this may be all that is needed.

  - Edging: In areas of slightly higher wave energy, edging in the form of coir rolls and/or oyster shell bags can be used to protect the existing vegetated toe of the marsh.

  - Sills: Parallel to vegetated shoreline; reduces wave energy and prevents erosion. Suitable for most areas except high wave energy environments.

  - Breakwater: Offshore structures located parallel to the shore intended to break waves, reducing the force of wave action and encouraging sediment accretion. They are suitable

for most areas and can be submerged or exposed. Where appropriate, they can be in the form of a living reef.

- Reef balls: Reef balls are complex geometric structures that can be installed to serve as an alternative to a traditional breakwater in some environments. They create habitat for shellfish, fish and other marine animals while simultaneously providing protection to the coast by attenuating wave energy.
- Bulkhead: Vertical wall parallel to the shoreline intended to hold soil in place. They are suitable for high-energy settings and sites with existing hard shoreline structures. Bulkheads are not a bioengineering solution but can sometimes be combined with bioengineering methods to reduce impacts on the local ecology and shoreline system.
- Artificial beach: In some cases, a gravel and/or cobble beach may be constructed in front of a bulkhead to reduce direct wave impacts and reduce erosion in front of the hard structure.
- Oyster bag/mat: Oyster bags/mats may be installed offshore of a bulkhead to create habitat and encourage colonization by native oysters.
- Plant native vegetation: Native vegetation planted landward of a bulkhead can trap airborne sediment and reduce erosion in the case that a bulkhead is overtopped.

B.4.2.1.3.3. POST-WILDFIRE STABILIZATION ACTIVITIES

Soil stabilization activities post-wildfire (including activities such as flood diversion and reforestation) may be eligible under HMA programs. Landscape or soil stabilization, flood diversion and reforestation following a wildfire event are important because of the increased threat of soil erosion following the destruction of the plant material and litter layer on the ground. Reducing the risk of flood and erosion after a fire through the implementation of soil stabilization, flood diversion and reforestation efforts is important to protecting nearby communities.

Numerous techniques can be used to control erosion and provide soil stabilization after a wildfire event. Short-term stabilization methods include:

- **Mulching**: Covering the area with a protective straw layer can prevent erosion. Mulch should be covered with plastic netting or adhered to the soil with a tacking agent to minimize loss of straw to adverse weather.
- **Erosion control mats or blankets**: Fibers, straw or other plant material that protects the soil from precipitation can be used on hillsides and along valleys.
- **Log terraces**: Dead trees can be placed on the contour, opposite the direction of the slope in an alternating fashion, preventing water from finding a direct path downslope and eroding soil.

- **Fiber rolls**: Fiber rolls are made from materials such as straw or coconut fiber and are rolled into a tube. They can be used as a temporary fix to control sediment and soil surface runoff and erosion and are particularly useful to protect against sedimentation of water sources near burn sites.

- **Hydroseeding**: A slurry of seed and mulch mixed with water and fertilizer can be planted to promote growth of native grasses. Grasses help reduce soil erosion because they have an extensive root system to hold soil in place.

- **Silt fences**: Woven wire and fabric filter cloth acts as a fence to trap sediment from runoff.

Reforestation is a long-term stabilization activity that involves replanting trees and selecting seedlings to restore forest health and reduce erosion. The effectiveness of reforestation depends in part on the rate of forest establishment and appropriate maintenance accomplished during establishment to control invasive species.

B.4.2.1.4. Other Stabilization Activities

Other stabilization projects may be eligible for assistance under HMA programs. FEMA encourages applicants and subapplicants to explore projects not explicitly detailed in the HMA Guide. Some other stabilization activities include:

- **Excavation**: Excavation is used to remove material from the slope to decrease the forces that drive sliding.
    - Generally, excavation is appropriate only for small slumps or near-surface failures.
    - The excavator should be kept a safe distance from the edge of the slope so it does not impose additional loads at the top of the slope, which could decrease slope stability.
    - The toe material at the bottom of the slope should not be removed.
    - Measures may include:
        - Removing material from the top of the slope and replacing with lightweight fill to reduce driving forces.
        - Benching or terracing the slope by making stair-step cuts.
        - Reshaping the ground surface to reduce the slope angle.
- **Reinforcement**: The shear strength of soil, which is a combination of frictional forces and cohesion between particles, is what resists downward movement of soil along a slope. Increasing the shear strength of soil helps to improve its resistance to sliding. There are several common methods of strengthening soil to improve sliding resistance. Measures may include:

- Use of geosynthetics to improve the strength of soil and rock.
- Constructing a toe buttress or berm at the bottom of the slope.
- Deep soil mixing, which involves mixing a chemical stabilizer such as cement and/or lime with soil in situ (i.e., in place) to improve soil strength.
- Soil nailing, typically steel rods or bars installed into the slope at an angle and held in place by cement grout.

- Drainage: Water is a key element that contributes to the stability or instability of a slope for several reasons:
  - The weight of water adds weight to the slope, which increases the driving forces on the slope and can decrease stability.
  - Water can dissolve bonding agents that hold soil or sediment particles together, which reduces the cohesion between particles and can lead to decreased stability.
  - Water can act as a lubricant between an overlying well-drained soil such as sands and gravels and poorly drained soils such as clays and some silts. In this last situation, the water drains more quickly through the well-drained soil and accumulates along its interface with the poorly drained soil because water cannot penetrate the poorly drained soil as quickly.

Improving drainage within a slope can help to improve slope stability. Drainage methods include:

- Install an interceptor trench, which is a drainage system installed near the top of a slope or above the top of a known slide area to collect and direct surface and subsurface water from within permeable soil layers away from the slope.
- Install horizontal drains, which are perforated pipes inserted into the slope at prescribed elevations and spacings to lower the water table to the level of the lowest pipe, which decreases the driving forces by decreasing the water content of the slope soils.
- Install check dams across a drainage ditch to slow the flow of water to reduce erosion.

B.4.2.2. Ineligible Activities

FEMA will not approve shoreline stabilization projects that include only sand/sediment placement as a risk reduction measure without accompanying stabilization measures. FEMA encourages the use of nature-based solutions for all shoreline stabilization measures. A general list of ineligible activities is included in Part 4.

B.4.2.3. Duplication of Programs

Bioengineered solutions may be eligible activities under programs by other federal agencies, such as the EPA, USACE and the Natural Resource Conservation Service. FEMA will not provide assistance for activities for which it determines the more specific authority lies with another federal agency or program. These other programs and authorities should be examined before applying for HMA. For more information refer to Part 4.

B.4.2.4. Cost-Effectiveness

Applicants and subapplicants must demonstrate that mitigation projects are cost-effective. Projects must be consistent with Part 5.

Projects must meet cost-effectiveness requirements to qualify for FEMA assistance. Cost-effectiveness is evaluated by FEMA using BCA; cost-effective projects have a BCR greater than 1.0.

Stabilization projects that improve or restore the natural environment may be eligible for ecosystem services benefits. For more information refer to Part 5.

B.4.2.5. Feasibility and Effectiveness

Projects must be consistent with Part 6.

Mitigation projects assisted by HMA must be both feasible and effective at mitigating the risks of the hazard(s) for which the project was designed. A project's feasibility is demonstrated through conformance with accepted engineering practices, established codes, standards, modeling techniques or best practices. The approach should use sound engineering practices and ecological principles to assess, design, construct and maintain living vegetative systems that are blended into the shoreline and the supported coastal ecosystem.

B.4.2.5.1. Design Development for Shoreline Stabilization Projects

To meet all established objectives, a combination of bioengineering techniques should be considered for a site-specific bioengineering project plan using the following selection criteria:

- Hydrology and hydraulics: The anticipated water surface elevations, wave and surge characteristics, prevailing currents, fetch, ice impacts and related forces should be used to determine the most appropriate type of stabilization structure (hard, bioengineered or a combination of the two) and the location and extent of selected measures.
- Coastal geomorphology: Form and function of the shoreline and its relationship to the coast and surrounding landscape should be studied to understand how the actions taken at the project site will affect the adjacent properties as well as the shoreline system.
- Geotechnical considerations: The type of rock and soil that make up the shoreline and surrounding area influence what measures are appropriate. Soil and geotechnical

deficiencies should be evaluated to focus selection of measures that can increase soil erosion resistance and allow for the establishment of vegetation where feasible.

B.4.2.5.2. Design Development for Streambank Stabilization Projects

A combination of bioengineering techniques should be considered for a site-specific bioengineering project plan using the following selection criteria:

- Hydrology: The movement and volume of the flow to and within the stream should be used to determine the best type of stabilization structure (hard/bioengineered).
- Hydraulics: The anticipated water surface elevations, velocities and related forces should be used to determine the location and extent of selected measures. Sudden changes in velocity or shear stresses in areas such as abutments or culverts may necessitate the use of traditional stabilization methods; whenever possible, projects should try to establish vegetation around hardened measures to gradually transition to upland vegetated areas.
- Fluvial geomorphology: Understanding which portions of the stream channel are damaged and what changes might occur to the stream channel in response to human-caused and natural disturbances helps determine appropriate restoration approaches. These strategies must consider the form and function of the stream channel and relationship to the stream and surrounding landscape.
- Geotechnical considerations: The type of rock and soil that make up the stream channel and surrounding area influence what measures are appropriate. Geotechnical deficiencies should be evaluated to focus the selection of measures that can increase soil shear strength using root systems if possible.

B.4.2.5.3. Design Development for Post-Wildfire Stabilization Projects

A combination of bioengineering techniques should be considered for a site-specific bioengineering project plan using the following selection criteria:

- Geotechnical considerations: The type of rock and soil of the affected area can influence which soil approaches are selected in the stabilization process. Different soil types and conditions affect infiltration rates, which can impact flooding and slope stability. Soils that are hydrophobic may need to be plowed or otherwise broken up to enable infiltration to occur, decreasing surface runoff.
- Silviculture: Long-term stabilization through reforestation is desirable to achieve objectives such as establishing the forest, improving air and water quality, enhancing wildlife habitat and increasing biodiversity. Typically, native species are selected for planting to help achieve these objectives while also preventing the establishment of non-native invasive species. Selection of the appropriate species for planting, determining the appropriate spacing of

trees and undertaking planting during the appropriate time of year for the selected species are important factors for achieving long-term stabilization.

B.4.2.5.4. Permitting and Regulations

It is important to address and comply with all federal, state and local regulations and obtain necessary permits after the completion of conceptual design. State and local law often runs parallel to or branches off from federal law; thus, federal, state and local reviews are often concurrent. Depending on the location, impacts, measures selected and material employed, various permits or certifications may be required before construction.

In general, permits are required from federal, state and local levels. For award, FEMA requires discussions with permitting agencies early in the project development process—even in the conceptual stages—and keeping documentation. Early discussions will likely save time and effort at the project closeout.

A list of pertinent regulations at the federal, state and local levels is included below:

- **Water quality permits**: Projects involving work within a water of the United States may require a 401 Water Quality Certification from state environmental agencies.[440] Projects with the potential to affect public drinking supplies through dewatering or other construction activities must contact the state environmental agency to identify regulatory requirements that may apply. Wherever applicable, projects proposing to discharge into surface water must comply with the permit requirements of the National Pollution Discharge Elimination System. Permits from USACE will also likely be required under Section 10 of the Rivers and Harbors Act and/or Section 404 of the Federal Water Pollution Control Act (Clean Water Act), and potentially permission will be required under Section 14 of the Rivers and Harbors Act.[441]

- **Scenic and historic preservation**: Permits or approvals may be required for projects that require earthmoving and/or demolition of a structure if the projects are within a certain distance from designated state wild, scenic or recreational, archaeological, and prehistoric or historical sites or structures.

- **Tidal wetland and coastal zone permits**: Special permit requirements may apply in tidal waters and ocean shorelines in some states. Permits are required for projects including engineering activity that affects dune fields, beaches or shoreline lands.

[440] Section 401 of the Federal Water Pollution Control Act (Clean Water Act), Public Law 92-500 (Oct. 18, 1972), as amended

[441] Sections 10 and 14 of the Rivers & Harbors Appropriation Act of 1899; Chapter 425, 30 Stat. 1151 (March 3, 1899), 33 U.S.C. § 403 and 33 U.S.C. § 408, respectively; Federal Water Pollution Control Act, Public Law 92-500 (Oct. 18, 1972), 33 U.S.C. § 1251 et seq.

- **Endangered species regulations**: Wildlife, natural resources and fisheries departments must be consulted to ensure compliance with state threatened and endangered species regulations.
- **Water rights**: Each state regulates water rights within its jurisdiction. If a project diverts water or causes changes to a water course, approval or granting of water rights by the state may be required.
- **Floodplain management permits**: Floodplain management or construction permits may be required by the local floodplain administrator for projects occurring within federally identified special hazard areas (the 1% annual chance floodplain).
- **Local stream and wetland ordinances**: Many city or county planning departments have local ordinances pertaining to streams and wetlands. Depending on the nature of the project, several permits may be required.
- **Local water resources permits**: Local or regional irrigation and water districts are empowered to protect water resources in their jurisdiction; permits may be required for certain projects.
- **Other**: Various agencies, utilities and authorities should be consulted for projects that depend on specific activities and locations.

Table 24 outlines the function and efficiency of streambank stabilization measures.

Table 24: Function and Efficiency of Streambank Stabilization Measures

			Function			*Material*		
Stabilization Measure	Slope Angle	In-stream	Erosion Control	Drainage	Flow Control	Natural Veg.	Geo Synthetic	Stone/ Rock
Fascines/stakes								
Live fascines	Low to High	No	Yes	No	Yes	Yes	No	Yes
Pole stakes	Low to Moderate	No	Yes	No	Yes	Yes	No	Yes
Post plantings	Low to Moderate	No	Yes	No	Yes	Yes	No	Yes
Blankets/mats								
Erosion control Blanket	No	Yes	Yes	No	No	Yes	Yes	No

				Function			*Material*	
Live brush mattress	No	Yes	Yes	No	No	Yes	No	No
Turf reinforce-ment mat	No	Yes	Yes	No	No	No	Yes	No
Vegetated gabion mattress	No	Yes	Yes	No	No	No	No	Yes
Toe Stabilization/Revetments								
Coconut fiber rolls	Low to Moderate	Yes	Yes	No	No	No	Yes	No
Stone fill trenches	Low to Moderate	Yes	Yes	No	Yes	No	No	Yes
Vegetated riprap	Moderate	No	Yes	No	Yes	Yes	No	No
Rootwad revetment	Low to Moderate	Yes	Yes	No	Yes	Yes	No	No
Live siltation/tree revetment	Moderate to High	No	Yes	No	No	Yes	No	No
Trench fill revetment	Low to Moderate	No	Yes	No	No	No	No	Yes
Longitudinal peak stone toe revetment	Low to High	No	Yes	No	No	No	No	Yes

B.4.2.6. Environmental and Historic Preservation

All subapplications submitted to FEMA must meet the EHP criteria in Part 4. All subapplications must provide the information described in Part 6 so that FEMA may perform the EHP review.

B.4.3. STABILIZATION: APPLICATION AND SUBMISSION INFORMATION

All subapplications submitted to FEMA must meet the eligibility criteria in Part 4. All subapplications must have a scoping narrative in accordance with Part 6. Project-specific criteria are highlighted below.

FEMA may request additional information after the subapplication has been submitted to ensure all necessary information is received. However, all information required by the regulations and the HMA Guide must be received before an assistance decision and award or final approval can be made.

B.4.3.1. Budget

All subapplications must include a line-item breakdown of all anticipated costs.

Subapplicants may apply for subrecipient management costs to cover administrative costs. Management costs must be included in the subapplication budget as a separate line item. More information about the requirements for management cost requests can be found in Part 13.

B.4.4. STABILIZATION: SUBAWARD IMPLEMENTATION

Project implementation includes site preparation, construction, planting, monitoring and aftercare. For the bioengineering design to be successful, implementation must be closely supervised throughout by someone familiar with the implementation of bioengineering projects. Continuity of the interdisciplinary team involved in the design is highly recommended, and consulting with someone who has implemented other bioengineering projects will help ensure the success of the project.

- **Streambank stabilization**: The optimum time to install bioengineered measures is usually during seasons when stream flows are typically low and dormant cuttings have the highest success rate for propagation. Scheduling the sequence of work is critical to project success. Scheduling considerations include endangered species' nesting seasons.

- **Shoreline stabilization**: Ideally, bioengineered measures should be installed in seasons with low storm-wave-induced erosion, when dormant cuttings have the highest success rate for propagation. Scheduling the sequence of work is critical to project success, such as considering endangered species' nesting seasons.

- **Wildfire stabilization:** Following a wildfire, there is increased vulnerability to secondary threats, such as floods and mudslides. Slope-stabilizing erosion control practices and forest regeneration can help mitigate floods and landslides. Short-term stabilization methods ideally should be implemented as soon as possible after the fire to help control erosion. Long-term reforestation methods should be undertaken during the appropriate planting season for the native species or seeding method selected.

B.4.4.1. Budget and Scope of Work Changes

Recipients are required to report deviations from budget, project scope or objectives in accordance with Part 8. Recipients must request prior approvals from FEMA for budget and program plan revisions.[442] If the final design is not complete prior to award, once the project is awarded, the

[442] 2 CFR § 200.308

design must be finalized by a licensed design professional. Any changes to the scope of work or budget because of completing the final design or to address permitting requirements must be consistent with Part 8. Construction design activities are defined as construction activities; therefore, budget changes involving them must be consistent with Part 8.F.2.

B.4.5. STABILIZATION: CLOSEOUT

Recipients and subrecipients must closeout projects in a timely manner consistent with Part 9.

In addition to the typical HMA program closeout process, closeout of stabilization projects includes submitting an operations and maintenance plan to FEMA for review prior to project closeout. In the operations and maintenance plan, the recipient must confirm the plan is consistent with the HMA Guide.

At a minimum, the operations and maintenance plan must include all the following information:

- Information demonstrating the completed stabilization project will be maintained to achieve the proposed hazard mitigation.
- A description of the post-closeout maintenance activities that will be undertaken to maintain the project area.
- The period of time the community is committing to maintain the area and/or project site, which must be consistent with the project useful life in the BCA.
- The department and position type that will be responsible for maintaining the project after the construction has ended.
- Estimated costs for annual maintenance of the project.
- The schedule for completion of the maintenance activities.

B.4.6. STABILIZATION: RESOURCES

Stabilization Resources

- FEMA BCA webpage: https://www.fema.gov/grants/guidance-tools/benefit-cost-analysis
- FEMA EHP review job aids: https://www.fema.gov/grants/guidance-tools/environmental-historic/preparation-resources
- NOAA climate.gov: https://www.climate.gov

B.5. Flood Risk Reduction

B.5.1. FLOOD RISK REDUCTION: OVERVIEW

Flood risk reduction projects are designed to lessen the frequency or depth of flood water. Flood risk reduction project types fall into two categories:

- Localized flood risk reduction measures.
- Non-localized flood risk reduction measures.

This section defines localized and non-localized flood risk and discusses several common project types to address each type of flood risk. The project types are not exhaustive but rather reflect those that are most common to the HMA programs.

B.5.1.1. Localized Flood Risk

Localized flood risk reduction measures are those actions or projects taken to lessen the frequency or severity of flooding and decrease predicted flood damage within an isolated or confined drainage or catchment area that is not hydraulically linked or connected to a larger basin that is regional in scale.

Eligible localized flood risk reduction efforts include measures that reduce flood losses for single structures or facilities, groups of structures, or whole neighborhoods within an isolated or confined drainage area that is not hydraulically linked to another area. Eligible localized flood risk reduction projects also include urban flooding measures. These projects include but are not limited to:

- Stormwater management projects, including the construction, installation or modification of culverts, drainage pipes, pumping stations, floodgates, bioswales, detention and retention basins, and other stormwater management facilities.
- Flood diversion and storage measures.
- Slope stabilization or grading to direct flood waters away from homes, schools, businesses, utilities or governmental facilities.
- Flood protection measures for water and sanitary sewer systems or other utility systems.
- Vegetation management for shoreline stabilization (coastal, riverine, riparian and other littoral zones).
- Flood protection and stabilization measures for roads and bridges.

FEMA encourages innovative technologies and project types that mitigate and reduce the impact of flood losses. Localized flood risk reduction projects are eligible for assistance under HMGP, HMGP Post Fire, BRIC and FMA.

B.5.1.1.1. Stormwater Management

While there may be many different types of localized flood risk reduction projects, stormwater management projects are some of the most common to the HMA programs. Stormwater management is defined as efforts to reduce the impact of increased runoff that results from new development in a watershed. Stormwater management also encompasses many aspects of water quality and includes efforts to reduce erosion and the entry of sediment and pollutants into receiving streams.

The objective of this activity is to prevent future development from increasing flood hazards to existing development, to protect existing hydrologic functions within the watershed, and to maintain and improve water quality. Unmanaged stormwater runoff from new development and redevelopment throughout a watershed increases flood hazards by causing more frequent flooding, greater flood depths and longer-lasting floods. As forests, fields and farms are covered by impermeable surfaces such as streets, rooftops and parking lots, more of the rain runs off, and at a faster rate. When an area is urbanized, the rate and volume of runoff can increase fivefold or more. Communities are affected by development that takes place upstream in their watershed, and the community's own development can have an impact on downstream communities. Communities are encouraged to cooperate with adjacent communities to manage stormwater. Stormwater management regulations regulate development on a case-by-case basis to ensure the peak flow and volume of stormwater runoff from each site will be no greater than the runoff from the site before it was developed or redeveloped.

Stormwater management practices can be grouped loosely into the following categories:

- **Infiltration**: These approaches manage stormwater by infiltrating it into the ground. These methods are considered pollutant-reducing. Some examples include porous pavement, subsurface infiltration and bioinfiltration.
- **Slow release**: These approaches detain and slowly release stormwater over time. An example is a detention/retention pond.
- **Pollutant-reducing**: These approaches incorporate pollutant-reducing practices. They may include infiltration practices and some slow-release practices.
- **Vegetated**: These approaches use vegetation as a significant component within the storage area. Examples include bioretention basins, ponds and wet basins, green roofs, and vegetated media filters.

- **Non-vegetated**: These approaches do not have a significant vegetation component. They include but are not limited to porous pavements, blue roofs, media filters, cisterns, and subsurface storage and conveyance methods.

B.5.1.1.2. Flood Diversion and Storage

Flood diversion and storage projects are climate resilient mitigation actions. These projects involve diverting floodwaters from a stream, river or other body of water into a wetland, floodplain, canal, pipe or other conduit (e.g., tunnels, wells) and storing them in aboveground reservoirs, floodplains, wetlands, green infrastructure elements or other storage facilities. Flood diversion and storage projects can be used to retain water to allow infiltration to groundwater supplies. This allows for a controlled way to mitigate flooding and enhance usable water supply to mitigate the effects of drought. Flood diversion and storage projects can also help maintain healthy ecosystems.

Depending on the scope, scale and location of potential sites, flood diversion and storage projects can vary in size and complexity. Proper planning, siting, sizing and construction are required to implement successful flood diversion and storage systems. In general, there are five different categories of flood storage areas:

- **Online**: Both dry and wet weather flows pass through the flood storage area.
- **Offline**: Dry and first-flush wet weather flows pass through the flood storage area. Larger flows bypass the facility.
- **Dry**: The flood storage system is kept essentially dry because of infiltration and evapotranspiration.
- **Wet**: The flood storage area contains water under all flow conditions.
- **Wet/dry**: Part of the flood storage area contains water and part is dry during various flow conditions.

Many flood diversion and storage projects are currently eligible for HMA as flood risk reduction activities. The HMA Guide focuses on flood diversion and storage projects implemented using green infrastructure methods as much as possible to address drought mitigation and climate change resilience in addition to reducing flood risk. Green infrastructure methods involve diverting the water into appropriately sized bioretention or biodetention basins. Smaller projects can provide localized flood reduction by channeling the diverted water into a bioswale, rain garden, stormwater tree trench or smaller bioretention or biodetention basin.

B.5.1.2. Non-localized Flood Risk

Non-localized flood risk reduction measures are those actions or projects that lessen the frequency or severity of flooding and decrease predicted flood damage within an area that is hydraulically linked or connected to a drainage basin that is regional in scale. These projects reduce flood hazards

in areas larger than those of localized flood risk reduction projects and may include but are not limited to:

- The construction, demolition or rehabilitation of dams and weirs.
- Construction or modification of dikes, levees, floodwalls, seawalls, groins, jetties, breakwaters and stabilized sand dunes.
- Large-scale channelization of a waterway.

Non-localized flood risk reduction measures are eligible under HMGP, HMGP Post Fire and BRIC. For FMA, non-localized flood risk reduction projects such as dikes, levees, floodwalls, seawalls, groins, jetties, dams and large-scale waterway channelization projects are not eligible unless the administrator specifically determines in approving a mitigation plan that such activities are the most cost-effective mitigation activities for the National Flood Mitigation Fund.[443]

For complex flood risk reduction projects, subapplicants are strongly encouraged to use project scoping/advance assistance or a phased project approach. Refer to Part 10 for more information. Examples of common project types are highlighted below. This is not an exhaustive list, and additional project types may be eligible.

B.5.1.2.1. Dams

Definitions of a dam vary among federal and state agencies based on regulatory criteria. The National Dam Safety Program Act of 1996[444] authorizes the national dam safety program and defines the term "dam" as:

> (A) any artificial barrier that has the ability to impound water, wastewater, or any liquid-borne material, for the purpose of storage or control of water, that (i) is 25 feet or more in height from (I) the natural bed of the stream channel or watercourse measured at the downstream toe of the barrier; or (II) if the barrier is not across a stream channel or watercourse, from the lowest elevation of the outside limit of the barrier to the maximum water storage elevation; or (ii) has an impounding capacity for maximum storage elevation of 50 acre-feet or more; but
>
> (B) does not include (i) a levee; or (ii) a barrier described in subparagraph (A) that (I) is six feet or less in height regardless of storage capacity; or (II) has a storage capacity at the maximum water storage elevation that is 15 acre-feet or less regardless of height unless the barrier, because of the location of the barrier or another physical characteristic of the barrier, is likely to pose a significant threat to human life or property if the barrier fails (as determined by the Director).

[443] 44 CFR § 77.6(c)(2)(vi).
[444] Public Law 104-303 (Oct. 12, 1996); 33 U.S.C. § 467 et seq.

Dams are classified to identify their potential hazard. Hazard potential classification systems are numerous and vary within and between state and federal agencies. The hazard classifications are used by state dam safety regulators for several purposes, including for planning at the state and local levels, assigning design requirements, and determining the frequency of operations and maintenance activities and inspections.

Section III of FEMA 333, *Federal Guidelines for Dam Safety: Hazard Potential Classification System for Dams* defines a system of low-, significant- and high-hazard potential classifications depending on the potential for loss of life, economic loss and environmental damage resulting from a hypothetical dam failure.

Eligible activities related to dam safety may include:

- Dam breach/break analysis to determine the effect on the downstream floodplain in the event of a dam break.
- Engineering studies to determine potential dam enhancements to increase reservoir capacity/reduce downstream flooding or reduce upstream backwater flood conditions.
- Enhancements to dam control structures, the emergency spillway or other critical dam infrastructure to mitigate existing natural hazard conditions.

B.5.1.2.2. Levee Systems

A levee system is a human-made barrier along a watercourse, designed and constructed in accordance with sound engineering practices. Levee systems have the principal function of excluding flood waters from a limited range of flood events from a portion of the floodplain. Levee systems can consist of earthen embankments, floodwalls or a combination of both. Levee systems often include other features such as gates, pipes and pump stations.

A levee system cannot be constructed in open space that has been created because of an acquisition project and subapplicants will be required to reject consideration of such use if they accept FEMA assistance to convert a property to permanent open space. For more information about required consultations, refer to Part 12.B.1.3.8.

B.5.1.2.3. Floodplain and Stream Restoration

Floodplain and stream restoration projects are used primarily to reduce flood risk and erosion by providing stable reaches. Through the use of nature-based solutions, they may also mitigate drought impacts and extreme heat, while restoring and enhancing the floodplain, stream channel and riparian ecosystem's natural function. They provide baseflow recharge, water supply augmentation, floodwater storage, terrestrial and aquatic wildlife habitat, and recreation opportunities by restoring the site's soil, hydrology and vegetation conditions that mimic predevelopment channel flow and floodplain connectivity.

Floodplain and stream restoration projects can be scaled as needed to fit the site conditions and goals of the project. Typical goals and objectives include:

- Reduce peak velocities and stream bank erosion.
- Reduce peak flood stages.
- Protect bridge abutments, bridges, road crossings and other infrastructure.
- Protect valuable land and property.
- Increase or improve water supply and capacity.
- Restore ecological habitats for plants and aquatic species such as fish and other wildlife.
- Restore or improve water quality.

Floodplain and stream restoration projects readily lend themselves to nature-based solutions to achieve the desired impact. Potential projects that can emphasize the role of nature-based solutions to maximize the ecosystem service benefits in addition to risk reduction include:

- **Floodplain setbacks**: Removing structures from the floodplain and restoring the channel to its historical configuration. The stream is left to freely meander and flood its overbanks. This may include acquiring at-risk structures for removal and establishing levee setbacks.
- **Multistage channels**: Involves an upper channel section(s) to provide flood conveyance with a natural low-flow channel(s) within it to provide habitat enhancement and improved sediment transport capacity.
- **Relief channels**: This technique typically involves restoring the channel to its original configuration and constructing a high-flow channel or relief culvert to provide for additional flood conveyance. The restored channel provides habitat benefits while the high-flow channel can be designed to divert excess flows, providing wetland or lowland habitat or recreational benefits.
- **Addition of in-stream structures**: Flow-changing devices are a broad category of structures that can be used to divert flows away from eroding banks. They are often used to shield banks from eroding flows, build up the toe of the bank, and direct flows to create a stable alignment.
- **Bank vegetation and seeding**: Trees and shrubs can provide lowland habitat, channel shading, soil and bank stabilization, and aesthetic benefits. The use of native vegetation is strongly encouraged to support creation or restoration of habitat and to maintain natural ecosystem conditions.

FEMA encourages communities to incorporate methods to mitigate the impacts of climate change into eligible HMA-assisted risk-reduction activities by providing guidance on mitigating flood and drought conditions.

B.5.2. FLOOD RISK REDUCTION: ELIGIBILITY

B.5.2.1. Eligible Activities

The following sections highlight eligible activities and costs for both localized and non-localized flood risk reduction measures.

The costs necessary to design and construct HMA flood risk reduction projects in accordance with the latest edition of ASCE 24 are eligible costs.

These costs may include:

- Professional services necessary to design, manage and implement the project.
- Data analyses/investigations directly related to the mitigation project (including geotechnical investigations, engineering reports and hydraulic analyses).
- Project planning and design activities, including construction verification.
- Site preparation, building materials and construction.
- Structural and conveyance systems capable of supporting flood loads.
- Other flood-resistant components that meet feasibility and regulatory requirements.
- Measures to avoid or treat adverse effects to historical properties and cultural resources.
- Costs related to complying with local utility requirements.
- Conditional Letters of Map Revisions/Letters of Map Revisions associated with the project.

B.5.2.1.1. Localized Flood Risk Reduction Activities

Localized flood risk reduction projects are considered minor projects and are eligible for assistance under HMGP, HMGP Post Fire, BRIC and FMA.

Eligible minor physical mitigation efforts include measures that reduce flood losses for single structures or facilities, groups of structures or whole neighborhoods.

B.5.2.1.2. Non-Localized Flood Risk Reduction Activities

Any non-localized flood risk reduction activities—including long-term flood hazard mitigation measures such as major flood risk reduction projects—that are cost-effective, feasible and designed

to substantially reduce the risk of future damage and loss of life from flooding are eligible for consideration under HMGP, HMGP Post Fire and BRIC.

For FMA, non-localized flood risk reduction projects such as dikes, levees, floodwalls, seawalls, groins, jetties, dams and large-scale waterway channelization projects are not eligible unless the administrator specifically determines in approving a mitigation plan that such activities are the most cost-effective mitigation activities for the National Flood Mitigation Fund.[445]

Section 1210(b) of the Disaster Recovery Reform Act creates an exception for HMGP to the prohibition under HMA that FEMA will not provide financial assistance for activities FEMA has determined another federal agency has more specific authority to conduct.[446] Specifically, Section 1210(b) of the Disaster Recovery Reform Act provides that FEMA may use HMGP assistance to fund activities authorized for the construction of federally authorized water resources development projects that would normally fall under the authority of USACE, as long as those activities are also eligible under HMGP. For more information, refer to Part 12.B.5.2.3.1.

B.5.2.2. Ineligible Activities

Flood risk reduction projects that address, without an increase in the level of protection, the operation, deferred or future maintenance, rehabilitation, restoration, repair or replacement of existing structures, facilities or infrastructure (e.g., dredging, debris removal, replacement of obsolete stormwater systems or bridges, and maintenance/rehabilitation of facilities, including dams and other flood risk reduction structures) are not eligible.

A general list of ineligible activities is included in Part 4.

In addition, ineligible costs associated with flood risk reduction projects include but are not limited to:

- General geotechnical or hydraulic studies not specifically related to the project site of the proposed mitigation activity, although engineering costs associated with the design (hydrologic and hydraulic calculations) and benefit cost are acceptable.
- Flood risk reduction projects related to the repair or replacement of dams and other flood risk reduction structures and repair of dams for the purpose of regular prescheduled or damage-induced maintenance.
- Project components not consistent with FEMA-approved performance criteria.

[445] Please note that while regulatory language at 44 CFR § 77.6(c)(2)(vi) refers to the National Flood Mitigation Fund, the funding for FMA may come from the National Flood Insurance Fund.
[446] Public Law 115-254 (Oct. 5, 2018)

For FMA, non-localized flood risk reduction projects are generally not eligible, unless the Administrator specifically determines in approving a mitigation plan that such activities are the most cost-effective mitigation activities for the National Flood Mitigation Fund.[447]

B.5.2.3. Duplication of Programs

Federal law and FEMA's regulations prohibit duplication of programs, although, for HMGP, there may be exceptions under limited circumstances if there is an extraordinary threat to lives, public health or safety, or improved property.[448]

Generally, no duplication of programs is presented by FEMA performing property acquisition for open space, elevation or localized flood risk reduction measures within a USACE or Natural Resource Conservation Service flood risk reduction project or study area. However, FEMA regulations require subrecipients to coordinate with USACE to ensure that no levee projects are planned in areas proposed for HMA property acquisition for open space activities.[449]

FEMA may not use HMA to mitigate a portion of a structure/facility owned or operated by another federal agency. However, if the structure/facility is only regulated by another federal agency for a purpose other than flood risk reduction, mitigation of the structure is still eligible for consideration under HMA programs. For example, dams regulated by the Environmental Protection Agency for water quality may be eligible for HMGP and BRIC flood protection improvements.

FEMA may not assist a project in an area if a statute states that another federal agency has exclusive jurisdiction to construct flood risk reduction structures in that specific area of the U.S.

FEMA cannot provide assistance for activities for which it determines the more specific authority lies with another federal agency or program.

For certain non-localized flood risk reduction projects, FEMA's authority to assist the project may overlap with USACE's or the Natural Resource Conservation Service's authority to fund a similar project. To avoid a duplication of programs concerning a non-localized flood risk reduction project, recipients and subrecipients should consult their local USACE or Natural Resource Conservation Service office prior to developing an HMA application for the project (for additional information regarding USACE coordination for HMGP projects, refer to Part 12.B.5.2.3.1). In general, duplication of programs should be evaluated at the project and site levels.

The following represent the most common duplication of programs situations with respect to non-localized flood risk reduction projects:

[447] 44 CFR § 77.6(c)(2)(vi)
[448] 44 CFR § 206.434(f)
[449] 44 CFR § 80.13(b)(1)

- If the USACE or Natural Resource Conservation Service is authorized to complete a specific structural flood risk reduction project, FEMA may not assist a structural flood risk reduction project of a similar nature in the area identified in the USACE or Natural Resource Conservation Service project plan. A duplication of programs exists regardless of whether assistance has been appropriated for the project.

- If the USACE or Natural Resource Conservation Service is authorized to perform a flood risk reduction study with the goal of exploring options for structural flood protection systems in a specified area, FEMA generally may not provide HMA for projects of a similar nature in the same area. When the other federal agency has completed the study and selected a project alternative—as indicated by a public record of decision—the study no longer presents a duplication of programs. At that point, generally only the selected project elements indicated in the public record of decision represent a duplication of programs.

B.5.2.3.1. USACE Projects and HMGP

Section 1210(b) of the Disaster Recovery Reform Act[450] creates an exception for HMGP to the prohibition under HMA that FEMA will not provide financial assistance for activities the agency has determined another federal agency has more specific authority to conduct. Specifically, Section 1210(b) of the Disaster Recovery Reform Act provides that FEMA may use HMGP assistance to fund the construction of federally authorized water resources development projects that would normally fall under the primary authority of USACE, if those activities are also eligible under HMGP. These include smaller projects that Congress has granted USACE continuing authority to construct, such as under Section 205 of the Flood Control Act of 1948, Section 103 of the River and Harbor Act of 1962, and other similar flood control acts, as well as larger projects that Congress has specifically authorized for construction (such as in the Water Resources Development Acts, which are periodically reauthorized).[451] These projects can address a variety of needs, including structural and non-structural flood risk reduction, coastal storm risk reduction and other water resources development purposes.

HMGP recipients may choose to prioritize and submit risk reduction applications for federally authorized water resources development projects normally under the primary purview of USACE. FEMA will contact the respective USACE District Office to identify the HMGP project potentially qualifying under USACE's various statutory and program authorities. Once identified for HMGP assistance, these projects require coordination with USACE (through FEMA) and they may be subject to certain conditions such as Section 408 permits and USACE standards, if applicable.

HMGP provides up to 75% federal cost share with a 25% non-federal cost share requirement. FEMA's federal cost share must be applied toward the federal share of the construction project and

[450] Public Law 115-254 (Oct. 5, 2018)

[451] Public Law Chapter 771, Title II, § 205, 62 U.S. Statute at Large 1175 (June 30, 1948), as amended; 33 U.S.C. § 701s; Public Law 87-874 (Oct. 23, 1962), as amended; 33 U.S.C. § 426g; Division AA of Public Law 116-260 (Dec. 27, 2020)

the non-federal cost share applied to the non-federal share of the construction project. HMGP funding may not exceed the total federal share for such project.

This provision does not affect:

1. The cost-share requirement of a mitigation measure under HMGP.
2. The eligibility criteria of the mitigation measure under HMGP.
3. The cost share requirement for a federally authorized water resources development project.
4. The responsibilities of a non-federal interest with respect to the federally authorized water resources development project, including those related to the provision of lands, easements, rights-of-way, relocation and disposal areas.

Once HMGP assistance is applied to the construction of the federally authorized water resources development project, no further federal assistance shall be provided for the project's construction. This prohibition is an important consideration when choosing to apply for HMGP assistance. However, the prohibition does not apply to subsequent modifications and repairs, which may be funded and implemented by USACE.

B.5.2.4. Cost-Effectiveness

Applicants and subapplicants must demonstrate that mitigation projects are cost-effective. Projects must be consistent with Part 5.

While the Office of Management and Budget (OMB) Circular A-94, *Guidelines and Discount Rates for Benefit-Cost Analysis of Federal Programs*, describes an exemption for water resources projects (refer to the White House Council on Environmental Quality's *Updated Principles, Requirements and Guidelines for Water and Land Related Resources Implementation Studies* [PR&G] [Dec. 2014]) the cost-effectiveness requirement in the HMA program authorizing statutes must be met. The cost-effectiveness determination should be supplemented by consideration of the PR&G criteria if applicable. Water resources projects may include flood diversion and storage and floodplain and stream restoration.

B.5.2.4.1. Floodplain and Stream Restoration and Floodwater Diversion and Storage Cost-Effectiveness

Floodplain and stream restoration and floodwater storage and diversion projects can provide flood risk reduction benefits that can be calculated using the BCA Toolkit. In addition, there are drought mitigation and ecosystem services benefits that may also be considered.

For more information, refer to Part 5.C.1.1.10.

If the subapplicant wants to include benefits from drought mitigation, the project application must identify the increased water supply capacity the floodplain and stream restoration or floodwater

storage and diversion project would provide in relation to the population that will be supported in a drought and during the project's useful life.

FEMA encourages communities to use the best available data to document a recurrence interval.

Floodplain and stream restoration or floodwater storage and diversion projects that result in new or restored wetlands; estuaries; or riparian, green or open space may leverage the ecosystem service benefits included in the BCA Toolkit. For these benefits, it would be necessary to quantify the total restored ecosystem area (in acres or square feet), define the land use type.

B.5.2.5. Feasibility and Effectiveness

Projects must be consistent with Part 3. Mitigation projects assisted by HMA must be both feasible and effective at mitigating the risks of the hazard(s) for which the project was designed. A project's feasibility is demonstrated through conformance with accepted engineering practices, established codes, standards, modeling techniques and best practices.

FEMA requires that certain HMA flood mitigation projects be designed and constructed in conformance with the design criteria of the latest published edition of ASCE 24 as a minimum standard for structures that are subject to building code requirements and that are located, in whole or in part, in flood hazard areas. Other infrastructure types must be designed in accordance with the codes and standards that govern the design and construction of the type of infrastructure.

FEMA will consider a project application that uses ASCE 24 (or other codes and standards applicable to the type of infrastructure) as consistent with HMA program engineering feasibility and effectiveness requirements. Project applications that do not use ASCE 24 or the infrastructure equivalent must submit documentation to demonstrate the project meets the engineering feasibility and effectiveness requirement. At closeout, the subrecipient will have to provide certification from the design professional that the design standards have been addressed.

Some water use projects are subject to water rights laws, which vary by jurisdiction. In the western U.S., the process of obtaining water rights may take several years. These issues should be addressed and, where possible, water rights should be obtained prior to application submission to prevent delays.

B.5.2.6. Environmental and Historic Preservation

All subapplications submitted to FEMA must meet the EHP criteria in Part 4. All subapplications must provide the information described in Part 6 so that FEMA may perform the EHP review.

FEMA, in consultation with appropriate federal and state agencies, will use the information provided in the application to ensure compliance with EHP requirements. This may include demonstrating methods to incorporate public participation in the review process and/or mitigate any EHP impacts resulting from the mitigation action.

B.5.2.6.1. Floodplain and Stream Restoration Environmental and Historic Preservation Considerations

The scope of the floodplain and stream restoration project and the presence of potentially sensitive environmental and cultural resources may impact the level of complexity of the EHP review. A floodplain restoration project with a smaller scope involving the removal of at-risk structures and planting native vegetation for bank stabilization may not require an EHP review as complex as a project with a larger scope.

B.5.2.6.2. Floodwater Diversion and Storage Environmental and Historic Preservation Considerations

The size and scale of the floodwater storage and diversion project and the presence of potentially sensitive environmental or cultural resources may impact the level of complexity of the EHP review. Neighborhood-scale projects in urban areas may not require as complex an EHP review as a larger-scale project impacting a floodplain. Projects larger than a neighborhood scale are more likely to affect wetlands, coastal zones, cultural resources or habitat for plants and wildlife. These issues need to be carefully evaluated during the design and planning of the project; a hydrologic and hydraulic analysis must be included as a part of the application package. In particular, the impacts on downstream flow patterns need to be considered to evaluate the effects on land use, the SFHAs, stream functions, stream habitat, and erosion or sedimentation rates.

B.5.3. FLOOD RISK REDUCTION: APPLICATION AND SUBMISSION INFORMATION

All subapplications submitted to FEMA must meet the eligibility criteria in Part 4. All subapplications must have a scoping narrative in accordance with Part 6. Project-specific criteria are highlighted below.

FEMA may request additional information after the subapplication has been submitted to ensure all necessary information is received. However, all information required by the regulations and the HMA Guide must be received before an assistance decision and award or final approval can be made.

For flood risk reduction structures, the subapplication must include the following:

- Site map and location information.
- Site photographs of proposed project area and the impacted properties.
- Narrative of the flood risk being mitigated, including flood event history in the project area, if available.
- Description of the existing conditions of the project area, including existing drainage systems, if any, and structures and infrastructure impacted by flooding.
- Description of how the project will reduce flooding depths and damage and specify the level of protection provided.

- Description of the structures and infrastructure that will benefit from the project.
- Documentation of two alternatives that were considered as part of the planning process. One alternative may be a "no action alternative" that would reflect the impacts if no action were taken. Describe why the selected project was the most practical, effective and environmentally sound alternative.
- Description of proposed activity, including deliverables and tasks required to complete the proposed activity.
- Documentation that the project can independently solve the problem and is a functional portion of a solution. Projects that are dependent on a contingent action to be effective or feasible are not eligible.
- Description of the project components (e.g., alignment, materials, structural design, maintenance and how the project will fit in with surrounding systems).
- Description of construction activities (e.g., site access, storage and security; site preparation; temporary construction; earthwork, including importation of fill or disposal of fill; installation of conveyance features; and repairs to infrastructure that might be damaged during construction so that subsurface components can be installed).
- Description of installation of grade structures and scour protection.
- Description of all permitting requirements.

It is necessary for subapplicants to demonstrate that there are no adverse impacts. Flood risk reduction projects are unique in that there is the potential to reduce risk of flooding in one area while increasing flood risk in another location. In addition to the items identified in Part 6, the following technical data are required:

- Design plans, specifications and engineering analysis (such as design calculations and minimum level of protection provided by the project).
- A statement by a licensed professional engineer that the project will not have negative impacts upstream or downstream of the project.
- Hydrologic and hydraulic report that provides data to support engineering analysis.
- Pre- and post-project inundation maps.

Because of the technical and complex nature of some flood risk reduction measures, FEMA may request additional information to determine/demonstrate technical feasibility and cost-effectiveness and to complete required EHP reviews.

B.5.3.1. Budget

All subapplications must include a line-item breakdown of all anticipated costs.

Subapplicants may apply for subrecipient management costs to cover administrative costs. Management costs must be included in the subapplication budget as a separate line item. More information about the requirements for management cost requests can be found in Part 13.

B.5.3.2. Schedule

A detailed schedule must be provided for all tasks identified in the project cost estimate and scope of work. The schedule should identify major milestones, with start and end dates for each activity. Project schedules must show completion of all activities including the construction period within the period of performance. Sufficient detail must be provided to document that the project can be completed within the period of performance.

B.5.3.3. Costs

Typical costs for a flood risk reduction project may include but are not limited to:

- Engineering and design services and cost estimate preparation.
- Data analysis/investigations directly related to the mitigation project, including geotechnical investigations, engineering reports, and hydrologic and hydraulic analyses.
- Construction management.
- Surveying.
- Permitting and/or legal fees.
- Project planning and design activities, including construction verification.
- All construction activities required for project completion.
- Cost related to complying with local utility requirements.
- Other costs mentioned above for specific flood risk reduction projects.

B.5.4. FLOOD RISK REDUCTION: SUBAWARD IMPLEMENTATION

The following are the basic steps in implementing an approved HMA flood risk reduction project:

1. Pre-construction (acquire land, if applicable; carry out design process; seek technical consultant; prepare cost estimate; obtain construction permits; hire construction manager/contractor).

2. Clear/prepare site and install erosion control measures to prepare for construction activities.
3. Complete excavation, foundation work and grading.
4. Construct project.
5. Relocate/restore utility lines.
6. Install plantings.
7. Complete inspections.

Post-award monitoring helps ensure subrecipients are achieving the objectives of the federal award consistent with the performance goals and milestones described in the subaward. To assist the recipient in monitoring flood risk reduction projects, the following milestone information or events should be included in Quarterly Progress Reports:

- If the subrecipient is acquiring contract support, the subrecipient should report when the request for proposal is completed, when the contract is out for bid, when the bid period closes, when proposals are reviewed, when the contractor is selected and the date of the kickoff meeting.
- Describe the current status including a summary of:
  - Recent progress and planned work.
  - Risks identified or changes from the milestones/deliverables submitted with the scope of work (e.g., financial concerns, coordination issues with state or local governments and utilities, project management or contracting issues, legal disputes, and significant changes impacting construction activities or timelines such as delays due to weather, materials, procurement or labor issues).
  - When construction has started, is substantially complete or completed.
- If property is purchased, the report should provide property address, purchase price and date.
- Any other milestones that have been identified in the subapplication, agreed to or are required by the recipient.

B.5.4.1. Budget and Scope of Work Changes

Recipients are required to report deviations from budget, project scope or objectives in accordance with Part 8. Recipients must request prior approvals from FEMA for budget and program plan

revisions.[452] If the final design is not complete prior to award, once the project is awarded, the design must be finalized by a licensed design professional. Any changes to the scope of work or budget because of completing the final design or to address permitting requirements must be consistent with Part 8. Construction design activities are defined as construction activities; therefore, budget changes involving them must be consistent with Part 8.F.2.

B.5.5. FLOOD RISK REDUCTION: CLOSEOUT

Recipients and subrecipients must closeout projects in a timely manner consistent with Part 9.

Upon completing an HMA flood risk reduction project, the authority having jurisdiction over the project must submit to the recipient a final verification assurance that the HMA flood risk reduction project was constructed as designed and in accordance with the approved scope of work. This documentation is included as project closeout documentation and must confirm that the HMA flood risk reduction project provides the intended level of protection. If the HMA flood risk reduction project is in an SFHA, the recipient must provide FEMA documentation of flood insurance for the structure and a copy of the recorded deed amendment. All other HMA program closeout requirements must also be addressed.

The recipient shall provide the following information:

- A Letter of Map Revision if a map revision was required.
- Photographs of the property site before and after project completion.
- Latitude/longitude of the project location to the nearest sixth decimal place. Starting and ending points may be required for large or linear projects such as a drainage improvement.
- Vicinity map and map of the SFHA, if applicable.
- Copy of the as-built drawings.
- Certification from a design professional that documents the project was completed in accordance with the scope of work and that all regulatory compliance grant conditions were implemented and documented.
- Final inspection report including the date of inspection and the name and job position of the inspector.
- Final signed operations and maintenance plan.

Closeout of flood risk reduction projects includes the submittal of an operations and maintenance plan to FEMA for review prior to subaward closeout. In the plan, the recipient must confirm the plan

[452] 2 CFR § 200.308

is consistent with the HMA Guide, meets or exceeds local codes, and is in conformance with appropriate permits. At a minimum, the operations and maintenance plan must include the following information:

- Information demonstrating the completed project will be maintained to achieve the proposed hazard mitigation.
- A description of the post-closeout maintenance activities that will be undertaken to maintain the project area.
- The period of time the community is committing to maintaining the area and/or project site, which must be consistent with the project useful life in the BCA.
- The department and job position that will be responsible for the project after construction has ended.
- Estimated costs for annual maintenance of the project.
- The schedule for completion of the maintenance activities.

As with any constructed project, project plans for flood risk reduction projects that include bioengineering must include maintenance and monitoring. These activities may occur more frequently while plans are establishing but will likely be minimal after they are established. Maintenance costs are a local responsibility and not a FEMA-eligible cost. The overall need for these activities depends on site conditions, including climate, ongoing coastal erosion, storm impacts and probability of animal disturbance.

B.5.6. FLOOD RISK REDUCTION: RESOURCES

Flood Risk Reduction Resources

- FEMA BCA: https://www.fema.gov/grants/guidance-tools/benefit-cost-analysis
- FEMA EHP review job aids: https://www.fema.gov/grants/guidance-tools/environmental-historic/preparation-resources
- FEMA 333, *Federal Guidelines for Dam Safety: Hazard Potential Classification System for Dams* (2004): https://www.ferc.gov/sites/default/files/2020-04/fema-333.pdf
- ASCE 24: https://ascelibrary.org/doi/book/10.1061/asce24
- National Ground-Water Monitoring Network: https://cida.usgs.gov/ngwmn/
- NASA Gravity Recovery and Climate Experiment provides satellite data on aquifer water levels: http://www.nasa.gov/mission_pages/Grace
- U.S. Global Change Research Program: http://www.globalchange.gov

- NOAA Climate.gov: https://www.climate.gov
- NOAA Digital Coast: https://coast.noaa.gov/digitalcoast/
- Policy Clarification: *BCA Tools for Drought, Ecosystem Services, and Post-Wildfire Mitigation for HMA* (May 27, 2016): https://www.fema.gov/media-library-data/1464899521902-b2d31bbf89cc089c3cd43851a33d4aee/PolicyClarification_BCA(Drought-EcosystemServices-Wildfire)_508.pdf
- White House Council on Environmental Quality's Updated Principles, Requirements and Guidelines for Water and Land Related Resources Implementation Studies: https://obamawhitehouse.archives.gov/administration/eop/ceq/initiatives/PandG

B.6. Floodproofing

B.6.1. FLOODPROOFING: OVERVIEW

Floodproofing is defined as any combination of structural or non-structural adjustments, changes or actions that reduce or eliminate flood damage to a building, contents and attendant utilities and equipment.[453] Floodproofing can prevent damage to existing buildings and can be used to meet compliance requirements for non-residential buildings.

Dry floodproofing measures are either passive or active, depending on whether they require human intervention. Passive measures do not require human intervention and are recommended whenever possible. Active (or emergency) measures require human intervention and are effective only if there is enough warning time to mobilize the labor and equipment necessary to implement them and to safely evacuate.

The NFIP allows a new or substantially improved non-residential building in Zone A (A, AE, A1-30, AR, AO or AH) to have a lowest floor below the Base Flood Elevation, provided that a licensed professional engineer or architect has certified the design and methods of construction as being dry floodproofed in accordance with established criteria.

In addition, the NFIP allows for the use of wet floodproofing of structures with a lowest floor below the Base Flood Elevation, if allowed by permit in the local regulations or the local jurisdiction issues a variance and other requirements are met. Refer to FEMA Policy #104-008-03, *Floodplain Management Requirements for Agricultural Structures and Accessory Structures*, FEMA Floodplain Management Bulletin P-2140, *Floodplain Management Requirements for Agricultural Structures and Accessory Structures, FEMA Floodplain Management Bulletin P-467-2 – Historic Structures*, and NFIP Technical Bulletin 7, *Wet Floodproofing Requirements and Limitations* for guidance on the use of wet floodproofing.

The following terms are important when considering floodproofing projects:

- **Substantial damage** is damage of any origin sustained by a structure whereby the cost of restoring the structure to its before-damage condition would equal or exceed 50% of the market value of the structure before the damage occurred.
- **Substantial improvement** is any repair, reconstruction, rehabilitation, addition or improvement of or to a building, the cost of which equals or exceeds 50% of the market value of the building before the improvement or repair is started (certain historic structures may be excluded).

[453] 44 CFR § 59.1, ASCE 24

- **Substantially impermeable walls** shall not permit the accumulation of more than 4 inches of water depth during a 24-hour period, and sump pumps shall be required to control this seepage.

- **Base Flood Elevation** is the elevation of the base flood relative to the datum specified on a community's FIRM. The base flood has a 1% chance of being equaled or exceeded in any given year (commonly called the 1% annual chance flood). Base flood elevations are shown on FIRMs for many SFHAs.

- **Freeboard** is an added margin of safety expressed in feet above a specific flood elevation, usually the Base Flood Elevation. In states and communities that require freeboard, buildings are required to be elevated or floodproofed to the higher elevation. For example, if a community adopts a 2-foot freeboard requirement, non-residential buildings are required to be elevated or floodproofed to 2 feet above the Base Flood Elevation.

- **Design flood elevation** is the elevation of the design flood relative to the datum specified on the community's FIRM. The design flood is associated with the greater of the area subject to the base flood or the area designated as a flood hazard area on a community flood map or otherwise designated.

Many non-residential buildings can benefit from using a combination of wet and dry floodproofing measures for adequate protection. Combining these activities is particularly useful when one or more of the following building or site conditions exist:

- Multistory or split-level buildings where different measures can be applied to different foundation types at different elevations.

- Large factories, warehouses and other industrial facilities constructed of a variety of materials that respond better to multiple floodproofing measures.

- Groups of buildings on the same site but at different elevations.

More information on floodproofing can be found at the FEMA "Building Science – Flood Publications" webpage.

B.6.1.1. Dry Floodproofing of Non-Residential Structures

Dry floodproofing of non-residential structures consists of a combination of measures that result in a non-residential structure (including the attendant utilities and equipment) being watertight with all elements substantially impermeable to the entrance of floodwater and with structural components having the capacity to resist flood loads.

The purpose of dry floodproofing a building is to make it watertight to floods. Dry floodproofing reduces the potential for flood damage by reducing the probability that the building interior will be

inundated. It can be an appropriate alternative for flood mitigation when relocating or elevating buildings is not cost-effective or technically feasible.

The minimum performance requirement for dry floodproofing measures is for a space that is protected by walls that are substantially impermeable and resistant to flood loads. A substantially impermeable wall limits water accumulation to a maximum accumulation of four inches in a 24-hour period with a sump pump to control seepage. However, the minimum performance requirement can be exceeded with proper planning, design and materials.

Incorporating flood damage-resistant materials into the dry floodproofing design up to the height of the dry floodproofing measure is recommended. Additionally, building systems such as walls and foundations may need to be strengthened to withstand direct flood forces and the loads imposed by floodproofing measures (e.g., shields, watertight doors), which are used to temporarily seal openings.

An effective dry floodproofing retrofit should include the following:

- Detailed site evaluation.
- Detailed building evaluation.
- Careful evaluation of all the dry floodproofing measures, including a consideration of residual risk.
- Design by a qualified licensed professional engineer or architect.
- Verification/testing that the constructed systems provide the desired floodproofing effectiveness. All flood abatement equipment used for dry floodproofing projects should be tested to nationally adopted standards, such as American National Standards Institute/FM 2510.
- Floodproofing Certificate for Non-Residential Structures for the dry floodproofing design.
- A plan for deploying any active dry floodproofing measures that require human intervention.
- Sufficient warning time to deploy active dry floodproofing measures and vacate the building.
- Operations and maintenance plan.

B.6.1.2. Dry Floodproofing of Historic Residential Structures

Though HMA does not allow for dry floodproofing residential structures, the NFIP gives special consideration to the unique value of designated historic buildings and structures. Provided such structures retain their designations, communities do not have to require them to be brought into compliance if the structures will be substantially improved or have been substantially damaged. The NFIP definition of “historic structures” generally includes structures that are (1) listed or preliminarily determined to be eligible for listing in the National Register of Historic Places, (2) certified or

preliminarily determined by the Secretary of the Interior Department as contributing to the historical significance of a registered historic district or a district preliminarily determined to qualify as a registered historic district, or (3) designated as a historic site under a state or local historic preservation program approved by the Secretary of the Interior Department.[454] The definition does not include structures that are merely old, those that residents refer to as historic or those that happen to be located in historic districts.

When floodproofing measures are applied to historic structures (including historic residential structures), the measures should be designed to mitigate or reduce the flood risk while preserving the building's historic integrity. Consultation with the state or tribal historic preservation officer and a design professional (engineer or architect), preferably experienced in rehabilitating historic structures, is necessary. Ideally, any floodproofing measure applied to a historic structure and/or its site will not affect the property's designation. If a structure does not retain its historic designation, it is subject to the basic NFIP requirements for substantial improvement/damage.

Floodproofing measures for historic structures do not need to be comprehensive to provide at least some degree of protection.

B.6.1.3. Wet Floodproofing of Non-Residential Structures

Wet floodproofing consists of the use of flood-damage-resistant materials and construction techniques to minimize flood damage to areas below the flood protection level of a structure, which is intentionally allowed to flood.

Wet floodproofing involves the following:

- Using flood damage-resistant materials below the design flood elevation throughout the building.
- Raising utilities and important contents to or above the flood protection level.
- Installing and configuring electrical and mechanical systems to minimize disruptions and facilitate repairs.
- Installing flood openings or other methods to equalize the hydrostatic pressure exerted by floodwaters.
- Installing pumps to remove floodwater gradually from basement areas after the flood (pump systems are only permitted when NFIP compliance is not required).

For information on NFIP requirements for wet floodproofing, refer to 44 CFR § 60.3, NFIP Technical Bulletin 7, FEMA Policy #104-008-3 and Floodplain Management Bulletin P-2140.

[454] 44 CFR § 59.1

B.6.2. FLOODPROOFING: ELIGIBILITY

Non-residential floodproofing projects are eligible under HMGP, HMGP Post Fire, BRIC and FMA.

B.6.2.1. Eligible Activities

Dry floodproofing projects are eligible for non-residential structures and historic residential structures outside of Coastal A Zones (areas within the SFHA with an inland limit of the Limit of Moderate Wave Action) or Coastal High Hazard Areas (Zone V, VE, or V or V1-30).

Wet floodproofing projects are eligible in areas below the lowest floor (i.e., in areas that will be used for parking, storage, or access).

B.6.2.2. Ineligible Activities

Dry floodproofing is not permitted in Coastal A Zones (areas within the SFHA with an inland limit of the Limit of Moderate Wave Action) or Coastal High Hazard Areas (Zone V, VE, or V or V1-30).

Wet floodproofing of structures where the lowest floor is below the required elevation is ineligible. A general list of ineligible activities is included in Part 4.

B.6.2.3. Cost-Effectiveness

Applicants and subapplicants must demonstrate that mitigation projects are cost-effective. Projects must be consistent with Part 5.

Determining the cost-effectiveness of a floodproofing project can be done using either the Flood Modeled Damage methodology or Historic/Professional Expected Damage methodologies, both of which are part of the FEMA BCA Toolkit. The Flood Modeled Damage method relies on flood hazard data, building characteristics and Depth-Damage Functions. The Historic/Professional Expected Damage methodology relies on historical or expected damage along with a recurrence interval associated with the damage. The Historic/Professional Expected Damage methodology is used more often for floodproofing because it generally requires less data collection and may better represent the complexity of some floodproofing projects.

For dry floodproofing, retrofitting an entire large building or multiple buildings is a complex and expensive undertaking that requires analysis and design to protect the buildings against flooding from numerous points of entry of various sizes. Consequently, limiting dry floodproofing measures to the most critical elements or operations of a facility that cannot be elevated may be more cost-effective. Building managers and owners can then focus on elevating other critical areas and wet floodproofing other lower-level areas that are less critical. This situation may apply to flood-prone hospitals, schools, fire and police stations, emergency operations centers, communication and data centers, essential government buildings and other critical facilities that serve the community or affect the safety, health or welfare of a large population.

Table 25 highlights the cost-effectiveness of floodproofing projects.

Table 25: Likelihood of Cost-Effectiveness of Floodproofing Project

Magnitude of Potential Loss ($)	Probability of Loss		
	Low	Medium	High
Low	Unlikely	Unlikely	Likely
Medium	Unlikely	Likely	Highly Likely
High	Likely	Likely	Highly Likely

For more information, refer to Part 5.

B.6.2.4. Feasibility and Effectiveness

Projects must be consistent with Part 3. Mitigation projects assisted by HMA must be both feasible and effective at mitigating the risks of the hazard(s) for which the project was designed. A project's feasibility is demonstrated through conformance with accepted engineering practices, established codes, standards, modeling techniques or best practices. FEMA recommends assessing a building in two stages. First, a preliminary assessment is completed to help determine the overall feasibility of flood mitigation. The preliminary assessment is often based only on a visual examination of the building and, when available, a review of construction drawings. The desired flood protection level of dry floodproofing can also be determined in the preliminary assessment.

If the preliminary assessment suggests that flood mitigation is possible, the next stage is to perform additional site and drawing reviews and conduct testing and analyses to confirm that flood mitigation is feasible. A detailed assessment requires accurate drawings of the building or, if drawings are not available, invasive testing to determine the structural aspects and condition of the building. Soil tests to determine the type and permeability of on-site soils may also be needed.

The condition assessment must not only determine the ability of structural components to withstand flood loads but also their impermeability. For example, basement walls between adjacent buildings should be evaluated for flood load resistance and impermeability. This is especially important in an urban environment or buildings constructed in phases; otherwise, the source of flooding may become the adjacent building. Structural components, window wells, ventilation openings and utilities can each be floodwater points of entry if not properly assessed and mitigated. During the condition assessment, bowing, lateral movement, corrosion, staining and evidence of frequent water entry all may indicate the building is not an ideal candidate for dry floodproofing.

A structural engineer can evaluate the building to determine whether it is feasible to retrofit by computing flood loads, evaluating options, developing a dry floodproofing solution and preparing a probable budget. For additional guidance refer to FEMA P-936, *Floodproofing Non-Residential Buildings* and NFIP Technical Bulletin 3, *Requirements for the Design and Certification of Dry Floodproofed Non-Residential and Mixed-Use Buildings*. Because the final design may not be

completed prior to award, once the project is awarded, the design must be finalized by a licensed professional engineer or architect, with some exceptions.

B.6.2.4.1. Codes and Standards

FEMA will use the latest published edition of ASCE 24 or its equivalent as the minimum design criteria for all HMA-assisted floodproofing projects in flood hazard areas. These flood hazard areas include floodways, coastal high-hazard areas and other high-risk flood hazard areas such as alluvial fans, flash flood areas, mudslide areas, erosion-prone areas and high-velocity areas. ASCE 24 addresses design and construction requirements for floodproofing for buildings in flood hazard areas when used for the construction of new buildings or to substantially improve existing buildings (including repair of substantial damage). ASCE 24 sets forth requirements for elevation, foundation designs, enclosures below elevated buildings, materials, wet and dry floodproofing, utility installations, building access and miscellaneous structures (e.g., decks, porches, patios, garages, chimneys and fireplaces, pools, and above- and belowground storage tanks). The use of the ASCE 24 standard or its equivalent will allow applicants to better demonstrate the technical feasibility and effectiveness of HMA projects in flood hazard areas and facilitate consistency in implementing HMA projects in flood hazard areas.

In addition, all HMA-assisted floodproofing projects in flood hazard areas must also comply with the requirements established by the Federal Flood Risk Management Standard. Refer to Part 4.I for more information about these requirements.

B.6.2.5. Environmental and Historic Preservation

All subapplications submitted to FEMA must meet the EHP criteria in Part 4. All subapplications must provide the information described in Part 6 so that FEMA may perform the EHP review.

B.6.2.6. National Flood Insurance Program Eligibility Requirements

Mitigation projects sited within the SFHA are eligible only if the jurisdiction is participating in the NFIP. For FMA only, all properties included in a subapplication must be NFIP-insured at the time of the opening of the application period. The flood insurance policy must be maintained throughout the period of performance and for the life of the structure. For additional information on flood insurance requirements, refer to Part 4.J.

B.6.2.6.1. Wet Floodproofing in Special Flood Hazard Areas

NFIP regulations do not permit wet floodproofing to be used to bring a substantial improvement/damage structure into compliance unless the area to be wet floodproofed is used solely for parking, building access or storage.[455]

[455] 44 CFR § 60.3(c)(5)

Application of wet floodproofing as a flood protection technique under the NFIP is limited to specific situations in Zone A (A, AE, A1-30, AH, AO and AR). For certain uses and types of structures, communities may allow wet floodproofing only through the issuance of a variance from certain floodplain management requirements. The situations and conditions in which a community may allow wet floodproofing are described in detail in NFIP Technical Bulletin 7, *Wet Floodproofing Requirements and Limitations for Buildings and Structures Located in Special Flood Hazard Areas in Accordance with the National Flood Insurance Program* (May 2022).

For structures in Zone V (V, VE and V1-30), more stringent design and construction requirements have been established for the portion of the structure below the Base Flood Elevation. For information on V-zone design and construction requirements, refer to the NFIP regulations under 44 CFR § 60.3; FEMA P-55, *Coastal Construction Manual: Principles and Practices of Planning, Siting, Designing, Constructing, and Maintaining Residential Buildings in Coastal Areas, Fourth Edition, Volume I* (Aug. 2011); and the FEMA "National Flood Insurance Technical Bulletins" webpage. For more information on NFIP's general requirements for wet floodproofing, refer to 44 CFR § 60.3, NFIP Technical Bulletin 7, FEMA Policy #104-008-3 and Floodplain Management Bulletin P-2140.

B.6.2.6.2. Dry Floodproofing in Special Flood Hazard Areas

An important objective of the NFIP is to protect structures constructed in floodplains from flood-induced damage. In support of this objective, the NFIP regulations include building design and construction criteria that apply to new construction and substantial improvements (including structures that have incurred substantial damage) of existing structures in SFHAs. Residential structures in Zone A (A, AE, A1-30, AR, AO or AH) must be constructed with their lowest floors elevated to or above the Base Flood Elevation. Non-residential structures constructed in Zone A (A, AE, A1-30, AR, AO or AH) must either have their lowest floors elevated to or above the Base Flood Elevation or be dry floodproofed to or above the Base Flood Elevation. Measures to accomplish dry floodproofing of non-residential structures must provide watertight protection and be designed to withstand hydrostatic, hydrodynamic and impact forces produced by flooding. The intent is to provide complete protection at least up to the floodproofing design level, which must, at a minimum, be at the Base Flood Elevation.

Dry floodproofing can be used to fulfill the requirements for non-residential buildings in SFHAs that are not subject to high-velocity wave action. Some requirements apply to existing buildings when the cost of repairing or improving a building in an SFHA equals or exceeds 50% of the building's market value. NFIP requires new and substantially improved buildings be constructed in ways that minimize or prevent flood damage. As with new non-residential buildings, existing non-residential buildings may be brought into compliance by elevating them on compliant foundations or, if determined to be feasible, by implementing dry floodproofing measures. For more information on NFIP's general requirements for dry floodproofing, refer to 44 CFR § 60.3(c) and NFIP Technical Bulletin 3.[456]

[456] Requirements for the Design and Certification of Dry Floodproofed Non-Residential and Mixed-Use Buildings Located in Special Flood Hazard Areas in Accordance with the National Flood Insurance Program (Jan. 2021)

Floodproofing Certificate for Non-Residential Structures (FEMA Form 086-0-34) is required for floodproofing measures to be recognized for NFIP purposes. It is used by the designer to certify the design, correct construction/installation of dry floodproofing components, and confirm existence of a comprehensive Maintenance Plan. It is required for the following types of buildings in Zone A for dry floodproofing:

- Dry floodproofed non-residential structures (no residential uses).
- Dry floodproofed portions of mixed-use buildings that have all residential uses located above the dry floodproofing design elevation.

This certificate is not required for wet floodproofing.

B.6.2.7. Special Flood Hazard Area Requirements

For structures in the SFHA at the completion of the project and all structures receiving FMA regardless of location in the SFHA, flood insurance must be maintained for the life of the property.[457] For more information, refer to Part 4.J.

B.6.3. FLOODPROOFING: APPLICATION AND SUBMISSION INFORMATION

All subapplications submitted to FEMA must meet the eligibility criteria in Part 4. All subapplications must have a scoping narrative in accordance with Part 6. Project-specific criteria are highlighted below.

FEMA may request additional information after the subapplication has been submitted to ensure all necessary information is received. However, all information required by the regulations and the HMA Guide must be received before an assistance decision and award or final approval can be made.

Businesses cannot apply for HMA programs, so the non-residential property owner must work with the local government to develop a project subapplication on behalf of the owner. Local governments may submit a retrofit project for a property as an individual subapplication or combine it with other projects as part of an aggregate subapplication (subject to program restrictions). Aggregating benefit and cost values is allowed for multiple buildings if they are all vulnerable to damage from similar hazard conditions. Refer to Part 5 for information on aggregating projects in one subapplication.

For non-residential floodproofing projects, the subapplication must include the following:

- Identification of the property to be mitigated.
- Identification of key project personnel and roles, such as design professional and contractor.

[457] 42 U.S.C. § 4012a(a)

- Selection of an eligible project.
- Inspection of the building by a licensed professional engineer or architect to verify the project can be implemented, if possible; if not done at this stage, it must be done during Step 4, Perform a Condition Assessment (Existing Structures).[458].
- Development of a project budget and work schedule.
- Completion of BCA using the FEMA BCA Toolkit (refer to Part 5 for additional information); if the BCR is 1.0 or more, the project is cost-effective. FEMA requires a BCR of 1.0 or greater for HMA.
- Verification that properties in designated SFHAs will obtain flood insurance and that the insurance will be recorded on the property deed.

The local government submits the subapplication to the state. The state then selects projects based on its priorities and submits applications to FEMA for review. FEMA reviews the projects for eligibility, completeness, engineering feasibility, cost-effectiveness, cost-reasonableness and EHP documentation. The review process also confirms all hazard mitigation activities adhere to all relevant statutes; regulations; program requirements, including other applicable federal, state, local and tribal laws; implementing regulations; and executive orders, all of which are detailed in the program guidance. Once FEMA approves a project and awards the grant, the state distributes the assistance to the local government, which distributes it to individuals as appropriate. Construction activities must not begin until after the money has been awarded; HMA is not available for activities initiated or completed prior to award or final approval.

B.6.3.1. Activities and Schedule

All subapplications, as part of the scope of work, must include an activities description referencing industry standards or project plans and specifications.

Additionally, a scope of work must include work activities, deliverables and timelines associated with a project. For a dry floodproofing project, the scope of work typically includes the problem description, proposed solution, description of existing conditions and work schedule.

B.6.3.2. Budget

All subapplications must include a line-item breakdown of all anticipated costs. Project costs typically include:

- Labor.

[458] NFIP Technical Bulletin 3, Requirements for the Design and Certification of Dry Floodproofed Non-Residential and Mixed-Use Buildings.

- Materials.
- Engineering and design.
- Project management.
- Construction engineering and inspection.
- Permitting.
- Estimated annual maintenance costs.

The costs for dry floodproofing a structure will depend on the following factors:

- Size of the structure.
- Height of the flood protection elevation.
- Types of sealant and shield material used.
- Number of plumbing lines that must be protected by check valves.
- Number of openings that must be covered by shields.

Subapplicants may apply for subrecipient management costs to cover administrative costs. Management costs must be included in the subapplication budget as a separate line item. More information about the requirements for management cost requests can be found in Part 13.

B.6.4. FLOODPROOFING: SUBAWARD IMPLEMENTATION

The following are basic steps in implementing an approved HMA non-residential floodproofing project:

1. If a design was not developed before application development, secure a licensed professional engineer or architect to design, inspect and sign off on a mitigation retrofit solution within the bounds of the approved subaward.
2. If a design solution was developed before application development or if a licensed professional engineer or architect is not needed because of the nature of the work, secure the services of a contractor to execute the work in the approved subaward.
3. Monitor the work being performed to ensure that all award and subaward requirements are being met.
4. Inspect the finished project and verify that all award and subaward requirements have been met. Work with the designer/contractor to resolve any issues of concern and work with the state in closing out the subaward after all requirements have been met.

B.6.4.1. Budget and Scope of Work Changes

Recipients are required to report deviations from budget, project scope or objectives, in accordance with Part 8. Recipients must request prior approvals from FEMA for budget and program plan revisions.[459]

If the final design is not complete prior to award, once the project is awarded, the design must be finalized by a licensed design professional, with some exceptions. Any changes to the scope of work or budget because of completing the final design or to address permitting requirements must be consistent with Part 8. Construction design activities are defined as construction activities; therefore, budget changes involving them must be consistent with Part 8.F.2.

B.6.5. FLOODPROOFING: CLOSEOUT

Recipients and subrecipients must closeout projects in a timely manner consistent with Part 9.

When the project has been completed, a licensed professional engineer or architect (preferably the same one as used during the initial project design) must conduct a final inspection and verify in an inspection report that the project they designed/signed off on was implemented as intended in the approved subaward. If a contractor was the only professional who performed the work, the contractor should verify in writing that they performed the work as outlined in the contract and subaward. The subrecipient must ensure that the subaward requirements have been met through any contracts the subrecipient has with professional engineers and architects or contractors because the subrecipient is ultimately responsible for meeting the requirements. Poorly written contracts can result in work that complies with the contract but is non-compliant with the subaward requirements. The written verification of the work performed along with other project documentation demonstrating subaward compliance will help facilitate a smooth, efficient project closeout.

After obtaining project verification from the designer/contractor, the subrecipient then submits the subaward project documentation to the recipient. The recipient verifies that the work was completed in accordance with the approved subaward documentation, including the scope of work, and performs the closeout procedures.

In addition to the typical HMA program closeout processes, closeout of non-residential floodproofing projects generally includes the following:

- A certificate of occupancy and the final *Elevation Certificate* (FEMA Form 086-0-33) and *Floodproofing Certificate for Non-Residential Structures* (FEMA Form 086-0-34) for each structure in the project to certify that the structure is code compliant and was elevated or floodproofed to the required elevation. FEMA will use the latest published edition of ASCE 24 or its equivalent as the minimum design.

[459] 2 CFR § 200.308

- A copy of a recorded deed for each property, including deed requirements for property maintenance and flood insurance.
- A signed *Acknowledgement of Conditions for Properties Using FEMA Hazard Mitigation Assistance* form for each structure.
- A certification from a building official or licensed professional engineer or architect verifying the structure was designed and constructed to the minimum standard of the two most recently published editions of the International Codes, even in locations where no code has been adopted.
- Final inspection report with the name of the inspector and date of inspection.
    - The report must provide a narrative of all the components of the project that were completed and verify the scope of work was completed and is consistent with activities identified in the scope of work.
    - The report must include photographs of the project area(s) with clear labels and a map of the project area(s) with accurate geospatial coordinates.
- A front, rear and side photograph of the final structure, including the date of the photograph, property address, latitude/longitude to the nearest sixth decimal place and the name of the photographer.
- Verification of flood insurance for each structure.
- An update to the property site information in the FEMA electronic application system for each structure.

B.6.6. FLOODPROOFING: RESOURCES

Floodproofing Resources

- FEMA BCA: https://www.fema.gov/grants/guidance-tools/benefit-cost-analysis
- FEMA EHP review job aids: https://www.fema.gov/grants/guidance-tools/environmental-historic/preparation-resources
- Increased Cost of Compliance: https://www.fema.gov/increased-cost-compliance-coverage
- NFIP Technical Bulletin 3, *Non-Residential Floodproofing Requirements and Certifications*: https://www.fema.gov/nfip-technical-bulletins
- NFIP Technical Bulletin 7, *Wet Floodproofing Requirements and Limitations*: https://www.fema.gov/nfip-technical-bulletins
- FEMA Building Science: https://www.fema.gov/building-science

- Floodproofing Non-Residential Buildings: https://www.fema.gov/sites/default/files/2020-07/fema_p-936_floodproofing_non-residential_buiildings_110618pdf.pdf
- *Elevation Certificate* (FEMA Form 086-0-33): https://www.fema.gov/sites/default/files/2020-07/fema_nfip_elevation-certificate-form_feb-2020.pdf
- *NFIP Flood Insurance Floodproofing Certificate for Non-Residential Structures* (FEMA Form 086-0-34): https://www.fema.gov/flood-insurance/find-form/underwriting
- NFIP Technical Bulletin 3-93, *Non- Residential Floodproofing: Requirements and Certification for Buildings Located in SFHAs in Accordance with the NFIP*: https://www.fema.gov/emergency-managers/risk-management/building-science/national-flood-insurance-technical-bulletins
- *Floodproofing Regulations* (EP 1165-2-314): https://www.publications.usace.army.mil/Portals/76/Publications/EngineerPamphlets/EP_1165-2-314.pdf
- ASCE 7, *Minimum Design Loads for Buildings and Other Structures*: https://sp360.asce.org/PersonifyEbusiness/Merchandise/Product-Details/productId/233133882?_ga=2.23792690.986535157.1605995028-909266363.1575997667
- ASCE 24, *Flood Resistant Design and Construction*: https://ascelibrary.org/doi/book/10.1061/asce24
- *Floodproof Construction: Working for Coastal Communities*: http://gccds.msstate.edu/research/floodproofconstruction/dryfloodproofconstructionresearchphasei/pdf%20chapters/SERRI%20Report%2080024_chapter%201%20and%20intro.pdf

B.7. Tsunami Vertical Evacuation Refuge

B.7.1. TSUNAMI VERTICAL EVACUATION REFUGE: OVERVIEW

Tsunamis are rare events often accompanied by some advance warning, from minutes to a couple of hours. Depending on their wave height and speed, they can inundate low-lying coastal areas as far as one mile inland.[460] As such, strategies for mitigating tsunami risk have generally involved evacuation to areas of naturally occurring high ground outside the area of tsunami inundation. In some locations, high ground may not exist, or tsunamis triggered by local events may not allow sufficient warning time for communities to evacuate low-lying areas. In the case of tsunamis triggered by distant events, which can be accompanied by longer warning times, coastal

[460] National Oceanic and Atmospheric Administration "Tsunamis" webpage

communities can still be at risk if evacuation routes are long and complex, or if the routes become crowded with evacuees or obstructed by damage.

Where horizontal evacuation out of the tsunami inundation zone is neither possible nor practical, a potential solution is vertical evacuation above rising waters into buildings and other structures with the strength and resilience necessary to resist the effects of tsunami waves. A vertical evacuation refuge is a structure or earthen mound designated as a place of refuge in the event of a tsunami, with sufficient height to elevate evacuees above the tsunami inundation depth, designed and constructed to resist tsunami load effects.

FEMA provides assistance for tsunami vertical evacuation refuges through HMA. A refuge is meant to offer protection for a few hours until the danger of the tsunami waves has passed. In most areas, damaging waves will occur within the first 12 hours after the triggering event, although the potential for abnormally high tides and coastal flooding can last up to 24 hours. Assistance is not available for longer-term shelters meant to provide safe, accessible and secure short-term housing and services for disaster survivors. Shelters typically include a place to sleep along with extended food and water supplies.

B.7.1.1. Definitions

Appendix M of the IBC, *Tsunami-Generated Flood Hazards*, states that "Tsunami Vertical Evacuation Refuge Structures located within a tsunami hazard design zone shall be planned, sited, and developed in general accordance with the planning criteria of the FEMA P-646 guidelines." As such, HMA uses the following definitions from FEMA P-646, *Guidelines for Design of Structures for Vertical Evacuation from Tsunamis, Third Edition* (Aug. 2019):

- **Refuge**: An evacuation facility intended to serve as a safe haven until an imminent danger has passed (e.g., a few hours).
- **Shelter**: An evacuation facility that is intended to provide safe, accessible and secure short-term housing for disaster survivors, typically including a place to sleep along with extended food and water supplies.
- **Vertical evacuation refuge**: A building, non-building structure or earthen mound designated as a place of refuge in the event of a tsunami, with sufficient height to elevate evacuees above the tsunami inundation depth, designed and constructed to resist tsunami load effects in accordance with ASCE/SEI 7 (latest published edition).

B.7.2. TSUNAMI VERTICAL EVACUATION REFUGE: ELIGIBILITY

B.7.2.1. General Considerations

Tsunami events can be preceded or followed by other natural hazards. The consequences of concurrent hazard events must be addressed as part of a tsunami vertical evacuation project. The

most common concurrent hazard events are earthquakes, fires, landslides and upstream river and waterway flooding.

In the case of near-source-generated tsunami hazards, vertical evacuation refuges must be designed for seismic load effects in addition to tsunami load effects and must consider access issues including post-earthquake functionality of vertical circulation systems (e.g., elevators, escalators and stairs), fire resistance and suppression, and availability of emergency power.[461] Vertical evacuation refuge structures must be tall enough to ensure safety of those seeking refuge even if the tsunami exceeds the design event. Vertical evacuation refuge structures should be located away from the wave-breaking zone when possible.

Functions that are critical for operation as a short-term refuge must be considered. Emergency power systems must be provided with adequate fuel supply and located above the anticipated flood level or adequately protected from water damage. Similarly, communications equipment must be protected from damage due to inundation, impact and seismic activity. Basic sanitation needs and safe storage for emergency provisions such as food and water must also be addressed. Fire protection systems must be designed in accordance with applicable fire safety codes.

Vertical evacuation refuge structures should be designed with considerations for ease of access and entry; compliance with ADA requirements; parking limitations; a policy regarding accommodation of pets; occupancy limitations; and protection of critical functions.

B.7.2.2. Eligibility Criteria

Tsunami vertical evacuation is eligible under HMGP, HMGP Post Fire and BRIC. To be eligible for HMA, vertical evacuation refuge structure applications and subapplications must include:

- Documentation on how the size and demographics of the impacted population was determined for use in locating and sizing the vertical evacuation refuge structure.
- How the impacted population would travel to the vertical evacuation refuge structure.
- Estimated travel times to reach the structure.
- Cost-effectiveness analysis using an approved FEMA methodology.
- Description of the approach the subapplicant will use in preparing the operations and management plan.

[461] A near-source-generated (local) tsunami is one that originates from a source that is close to the site of interest and arrives within one hour of the triggering event (United Nations Educational, Scientific and Cultural Organization/Intergovernmental Oceanographic Commission *Tsunami Glossary* [2019]).

B.7.2.2.1. Populations Served by the Tsunami Vertical Evacuation Refuge

FEMA will only consider HMGP, HMGP Post Fire and BRIC subapplications for vertical evacuation refuge projects that identify that the population will not have time to evacuate the area and would face an imminent threat of tsunami-related hazards. The applicant or subapplicant will identify and quantify this population so the size of the vertical evacuation refuge can be verified during the application review process. The size of the vertical evacuation refuge is demonstrated by risk assessment information, such as information that is developed as part of a mitigation plan or evacuation plan.

HMGP, HMGP Post Fire and BRIC assistance is not available for general population shelters, including recovery shelters. The emergency management measures necessary to afford protection to thousands of occupants of large, public venues, such as stadiums or amphitheaters, are beyond the scope of HMGP, HMGP Post Fire, or BRIC refuge structures; therefore, community shelters are not eligible for HMGP, HMGP Post Fire, or BRIC assistance. Applicants and subapplicants must identify the hazard mitigation population to be protected, otherwise the application review may be delayed or the application may be rejected.

The following information provides details to help applicants and subapplicants identify, quantify and document eligible populations needing hazard mitigation life-safety protection during tsunami events. This section further describes categories of populations that are affected by tsunamis.

At a minimum, the applicant will demonstrate consideration of the following components in determining the eligible tsunami vertical evacuation structure population:

- Population to be protected within the area of impact by tsunami hazards.
- Warning capabilities, logistics and operation components that support basic vertical evacuation refuge functions.
- Travel times and routes for the population to be protected to reach the vertical evacuation refuge so that people are not exposed to additional risk when moving to the protected area.
- Hazard mitigation time of protection according to FEMA P-646 (minimum of eight hours and maximum of 24 hours).
- Relationship of the population to be protected by the vertical evacuation refuge to state or local emergency evacuation requirements.
- Effective and accessible warnings (alerts) that address the needs of individuals with disabilities and other access and functional needs and/or individuals who have limited English proficiency. Refer to the FEMA "Integrated Public Alert and Warning System" webpage for additional information.

B.7.2.2.2. Tsunami Vertical Evacuation Refuge Sizing Criteria

The identified population directly affects the proposed vertical evacuation refuge size and is verified during the subaward review process. HMGP, HMGP Post Fire and BRIC assistance is not provided for vertical evacuation refuges that are larger than the size required to accommodate the identified population. HMGP, HMGP Post Fire and BRIC vertical evacuation refuge project applications are subject to usable floor area per occupant space requirements and size limitations identified in the design criteria noted in this section. Table 26 identifies the minimum required usable floor area per occupant consistent with FEMA P-646- and ASCE/SEI 7-recognized design criteria.

Table 26: HMA-Assisted Tsunami Vertical Evacuation Refuge Minimum Usable Floor Area per Occupant

Occupant Type	Minimum Usable Floor Area per Occupant* (square feet)
Standing or seated	10
Wheelchair user	10
Medical bed user	30

* In addition to the square footage requirement per person, applicants and subapplicants who are modifying existing space must consider the normal functional use of the area. The type of durable medical equipment and furniture in a dual-purpose vertical evacuation refuge will determine how to calculate the net usable area. The net usable area is the available area to be used by the occupants after reducing the non-usable area from the gross area.

FEMA P-646 recommends the following:

- Usable floor area is 50% of gross floor area in shelter areas with concentrated furnishings or fixed seating.
- Usable floor area is 65% of gross floor area for structures with unconcentrated furnishings and without fixed seating.
- Usable floor area is 85% of gross floor area for structures with open plan furnishings and without fixed seating.

B.7.2.2.3. Population Impacted by Tsunamis

This section provides information to help applicants and subapplicants identify and define the population impacted by tsunamis and identify who may require a vertical evacuation facility.

B.7.2.2.3.1. INUNDATION MODELING AND MAPPING

As a community conducts a tsunami hazard assessment, it likely will complete inundation modeling and mapping. NOAA has already completed site-specific inundation models for 75 sites.[462] These forecast models can be used to identify the area likely to be inundated during a tsunami. In addition to the NOAA models, other models are available to evaluate the potential inundation area for the Maximum Considered Tsunami, which is taken as a probabilistic tsunami having a 2% chance of being exceeded in a 50-year period, which equates to a 2,475-year mean recurrence interval. FEMA P-646 tsunami modeling generally is not widely commercially available but can be performed by a number of organizations, including government laboratories (such as U.S. Geological Survey, NOAA and Los Alamos National Laboratory), some universities, and some coastal engineering consulting companies with coastal engineering expertise. ASCE/SEI 7 also includes a tsunami geodatabase for the West Coast, Hawaii and parts of Alaska. The geodatabase provides information for some design parameters such as the extent of the Tsunami Design Zone. Where design data are not available, ASCE/SEI 7 requires a probabilistic tsunami hazard analysis to be performed to develop design parameters. Additional information about how to conduct this analysis is included in ASCE/SEI 7.

Demographic information can be obtained for the likely inundation area to determine the characteristics of the population that could be impacted by a tsunami. This information can be used in the planning and design processes for vertical evacuation refuges. In addition to the resident population, the potential for tourists and other non-residents should be considered when determining the population to be served by the vertical evacuation refuge.

B.7.2.2.3.2. EVACUATION MODELING

Once the likely inundation area is known and the potentially affected population is quantified and characterized, evacuation models can be used to simulate evacuating the population to the shelter location by vehicle and/or on foot. Different models can simulate route selection, response time, travel speed, terrain, road networks, traffic, etc. They can also include parameters to simulate debris blockages, road damage and collapses of bridges and buildings. The evacuation models can be used to determine the estimated reduction in injuries and lives lost during the design event. The evacuation models can be run multiple times to account for different travel speeds, refuge locations and other considerations to evaluate strategic locations for the refuges, the number of people to be accommodated, and accommodations to serve various segments of the population.

B.7.2.2.3.3. TSUNAMI PERIOD OF PROTECTION

As identified in FEMA P-646, the hazard mitigation time of protection for tsunami vertical evacuation refuges is eight to 24 hours. Therefore, any ancillary equipment required to operate during an event for the refuge must also be properly sized and protected to the same level as the refuge.

[462] Refer to the NOAA Center for Tsunami Research "Forecast Inundation Models" webpage.

B.7.2.2.3.4. TSUNAMI DOCUMENTATION

Applicants and subapplicants must provide documentation to support the identified population for the vertical evacuation refuge and must also submit adequate documentation in support of their risk assessments to allow program reviewers to determine whether the proposed refuge size is appropriate for the identified population. The documentation should be sufficiently detailed to be verified during the review process. Applicant and subapplicant coordination with the applicable federal, state or local agency responsible for developing emergency evacuation plans is critical.

Each program identifies documentation requirements. In general, however, documents that can be used to quantify the disproportionately impacted population, such as evacuation plans, emergency response plans, evacuation and inundation models, and meeting notes, are acceptable. For example, the population categories listed above may be part of the affected population identified in an emergency evacuation plan.

In all cases, the planning and operation of HMGP, HMGP Post Fire and BRIC vertical evacuation refuges, including identifying the population to be protected, must not conflict with state and/or local evacuation plans.

HMGP, HMGP Post Fire and BRIC vertical evacuation refuge activities must not be used as a substitute for, or as an option for individuals to ignore, local community and/or state evacuation plans or any other law or ordinance.

B.7.2.2.3.5. TSUNAMI WARNING CAPABILITIES

In addition to design and construction criteria, an accessible and effective warning system must be in place to notify prospective community tsunami vertical evacuation refuge occupants when they should evacuate to the facility. Applicants and subapplicants for tsunami vertical evacuation refuge projects must demonstrate that the population can be properly notified to allow sufficient travel time to the refuge.

B.7.2.3. Eligible Activities

Tsunami vertical evacuation is only eligible under HMGP, HMGP Post Fire and BRIC. Eligible activities could include:

- Design and/or construction of a single-purpose facility for a tsunami vertical evacuation refuge.
- Design and/or construction costs to add a vertical evacuation component to a new multipurpose facility.
- Modification of existing structures to accommodate a tsunami vertical evacuation refuge.
- Construction of elevated earthen berms for tsunami vertical evacuation.

Allowable tsunami vertical evacuation refuge structure project costs are directly related to and necessary for the hazard mitigation purpose of providing immediate life-safety protection by means of the structure for the limited population required to remain in the impact area during the event.

Budgets contained in applications and subapplications should include only eligible costs. Table 27 shows eligible and ineligible components of tsunami vertical evacuation refuges. This table can be referred to when determining whether a component is an eligible cost of a tsunami vertical refuge application.

Eligible costs for HMGP, HMGP Post Fire and BRIC-assisted tsunami vertical evacuation refuge projects are costs for project components (e.g., design, construction and project administration) that are related directly to, and necessary for, the hazard mitigation purpose of providing immediate life-safety protection to the limited population that must evacuate in anticipation of a tsunami impacting the geographic area.

Eligible project costs are limited to:

- Protection by design components, in the case where a portion of an existing building is converted to a tsunami vertical evacuation refuge, including the exterior structural components, foundations, floor systems, columns, beams and wall systems, as specified in FEMA P-646, the latest published edition of ASCE/SEI 7 and the IBC, and applicable local building codes.
- Design and construction components for tsunami vertical evacuation refuge portion only, including engineering fees, permit fees, special inspection fees and excavation.
- Required features necessary for critical functions, including emergency power, electrical equipment, communications equipment, and ADA requirements such as accessible toilets and hand-washing stations.

Table 27: Eligible and Ineligible Components of Tsunami Vertical Evacuation Refuges

Components	Is the component eligible?
Structural systems that directly support or protect the tsunami vertical evacuation refuge or portion of building that serves this function	Yes
Means of 24-hour access	Yes
Protection of backup mechanical, electrical, ventilation and communication equipment necessary to provide critical functions for the tsunami vertical evacuation refuge	Yes
Signage	Yes
Communications, including at least one backup means of communication	Yes

Components	Is the component eligible?
Battery-powered signal emitting device that can be used to signal the location of the facility to local emergency personnel	Yes
Construction and permit fees	Yes
Alternate source of power	Yes
First aid supplies and equipment	Yes
Fire suppression systems (sprinkler systems and fire extinguishers)	Yes
Electrical lighting and outlets required for tsunami vertical evacuation refuge or portion of building that serves that function	Yes
ADA requirements	Yes
Ventilation	Yes
Heating, ventilation and air conditioning used for required ventilation	Yes
Heating, ventilation and air conditioning not used for required ventilation	No
Accessible toilets and hand-washing stations in tsunami vertical evacuation refuge or portion of building that serves this function	Yes
Planning/engineering/architecture design fees	Yes
Engineering study to calculate undefined flood elevations and/or inundation zones	Yes
Engineering peer review	Yes
Site preparation	Yes
Inspections, including special inspections	Yes
Geotechnical investigation	Yes
Storage room for food, water and safety equipment	Yes
Purchase of land (market value of the real property [land and structure] at the time of sale)	Yes
Fees for necessary appraisals, title searches, title insurance, property inspections, permit fees and surveys	Yes
Fees associated with the title transfer, contract review and other costs associated with conducting the real estate settlement, including recordation of the deed and deed restrictions	Yes

Components	Is the component eligible?
Property tax liens or tax obligations can be extinguished with proceeds from property sale while performing the transfer of title	Yes
Tsunami vertical evacuation refuge maintenance	No
Restroom fixtures not required by code, FEMA P-646 or ASCE/SEI 7	No
Paint on walls and ceilings of tsunami vertical evacuation refuge	No
Floor coverings – subfloors not required for life safety	No
Removal of structures from developed land	No
Kitchen cabinets, countertops and other equipment not required for life safety	No
Security cameras and emergency operations center-type equipment	No
Landscaping	No
Parking and all non-building elements unless required for ADA compliance	No

B.7.2.4. Ineligible Activities

Costs associated with providing facilities for any function that is not essential for life-safety protection of occupants are not eligible. If a tsunami vertical evacuation refuge structure can fulfill its basic function of life-safety protection for users during a tsunami without a building feature or component that provides conveniences or additional comfort, costs associated with that feature or component are not eligible.

Refer to Table 27 for a list of ineligible activities related to tsunami vertical evacuation refuge. A general list of ineligible activities is included in Part 4.

B.7.2.5. Cost-Effectiveness

Applicants and subapplicants must demonstrate that mitigation projects are cost-effective. Projects must be consistent with Part 5.

The FEMA BCA Toolkit currently does not have a tsunami module. Applicants and subapplicants may work with their respective FEMA regional office and the BCA Helpline to determine how the Historic/Professional Expected Damage methodology may be used and approaches like those used for safe rooms might be applied, or if other approaches/models are acceptable.

B.7.2.6. Feasibility and Effectiveness

Projects must be consistent with Part 4. Mitigation projects assisted by HMA must be both feasible and effective at mitigating the risks of the hazard(s) for which the project was designed. A project's

feasibility is demonstrated through conformance with accepted engineering practices or established codes, standards, modeling techniques, or best practices.

B.7.2.6.1. Codes and Standards

Vertical evacuation refuge structures must be designed for tsunami load effects, including seismic-resistant and progressive collapse-resistant design features, which will require additional strength and ductility compared with normal structures.[463]

To qualify for HMGP, HMGP Post Fire or BRIC assistance, a tsunami vertical evacuation structure must be designed and constructed to:

- Provide immediate life-safety protection in the projected impact area of a tsunami.
- Meet or exceed the requirements and recommended criteria in FEMA P-646 and the latest published edition of ASCE/SEI 7 and is verified by a licensed design professional. The design must also be peer reviewed by an independent, qualified peer reviewer who is approved by the authority-having jurisdiction.
- Designed and sized only to the extent necessary for the limited population that must take refuge in the tsunami impact strike/inundation area. The refuge structure is also designed for the limited time period that a tsunami is occurring. Therefore, tsunami vertical evacuation refuge structures must be sized according to the defined population that will use the facility during the event, and the design is to accommodate this population for a limited period.

In addition, all tsunami vertical evacuation refuge projects in flood hazard areas must also comply with the requirements established by the Federal Flood Risk Management Standard, conform to local floodplain regulations, and be permitted by the local floodplain administrator. [464] Refer to Part 4.I for more information about these requirements.

B.7.2.7. Environmental and Historic Preservation

All subapplications submitted to FEMA must meet the EHP criteria in Part 4. All subapplications must provide the information described in Part 6 so that FEMA may perform the EHP review.

B.7.3. TSUNAMI VERTICAL EVACUATION REFUGE: APPLICATION AND SUBMISSION INFORMATION

All subapplications submitted to FEMA must meet the eligibility criteria in Part 4. All subapplications must have a scoping narrative in accordance with Part 6. Project-specific criteria are highlighted below.

[463] FEMA P-646
[464] 44 CFR § 60.3

FEMA may request additional information after the subapplication has been submitted to ensure all necessary information is received. However, all information required by the regulations and the HMA Guide must be received before an assistance decision and award or final approval can be made.

The subapplication must include the following identification of the impacted population:

- Documentation on the composition, size and rationale for including each group designated as an impacted population.
- Description of warning capabilities, logistics and operation components that support basic refuge functions.
- Documentation that demonstrates how the designated population would reach the refuge within the prescribed time limit after notification as required by FEMA P-646.
- If land acquisition is proposed, the current value of property and documentation demonstrating how the market value was determined.
- Description of the approach the subapplicant will use in preparing the operations and maintenance plan, including all the following components:
    - A description of the maintenance procedures.
    - A brief statement about the operation of the refuge when it is in use.
    - Basic information about how the refuge will be used, including how use is initiated, the warning system, and basic procedures for opening refuge to the public.
    - Key components of the refuge maintenance procedures.
- The office that will be responsible for the operations and management of the refuge.
- Assurance that the operations and management plan will be developed and completed before project closeout.

B.7.3.1. Property Location

All subapplications must include latitude/longitude to the nearest sixth decimal place, site photographs, site maps and project plans and specifications.

Property information must also include the estimated furthest distance from the refuge to the population it is intended to serve and travel times by car and foot to reach the refuge. Travel times must account for travel within the structure itself to reach the top.

B.7.3.2. Clear Title

If property acquisition is proposed, the subrecipient must conduct a title search for the property it plans to acquire. The purpose of the title search is to ensure the owner is the sole and actual titleholder to the property, to identify other persons with a property interest if the owner is not the sole and actual titleholder and to ensure the title is clear (i.e., no mortgages or liens are outstanding on the sale of the property).

Prior to the purchase of the property, the subapplicant should document the process they will use to gain the necessary state and local approvals to construct a refuge.

Other title-related requirements are as follows:

- A title insurance policy demonstrating the clear title must be obtained for each approved property that will be acquired.
- A physical site inspection for each property must be conducted to verify there are no physical encumbrances to the property (a site survey may be necessary to clearly establish property boundaries).
- The property title must be transferred by a warranty deed in all jurisdictions that recognize warranty deeds.
- The subrecipient must take possession at settlement.
- The subrecipient must record the deed at the same time as settlement along with any program deed restrictions.
- The deed transferring title to the property and the program deed restrictions will be recorded according to state law and within 14 calendar days after the settlement.

B.7.3.3. Budget

All subapplications must include a line-item breakdown of all anticipated costs. Refer to Part 6 for more information.

Vertical evacuation structures require more strength and ductility than “typical” structures to ensure they will function after a seismic event and potential tsunami inundation. Consequently, it is expected that the cost to construct a tsunami vertical evacuation refuge will be higher than for standard structures. According to FEMA P-646, the cost to construct a vertical evacuation structure is likely to be 10 to 20% greater than a standard structure to account for the required seismic- and tsunami-resistant design features. However, relative costs will depend on geographic location, site-specific features and the specific hazard conditions.

Applications for vertical evacuation refuge projects must include detailed line-item costs in the project budgets. Well-documented project budgets contain quantities, unit costs and a source for

each unit cost. In contrast, lump-sum budgets do not provide quantities and unit costs required to evaluate the accuracy of the project budget. Lump-sum estimates are not acceptable.

Under HMGP, HMGP Post Fire and BRIC, project budgets include unit costs related to the proposed square footage of the protected area or areas of the vertical evacuation structure. Unit costs may also be related to the protected population (occupants) of the vertical evacuation structure.

Subapplicants may apply for subrecipient management costs to cover administrative costs. Management costs must be included in the subapplication budget as a separate line item. More information about the requirements for management cost requests can be found in Part 13.

B.7.3.3.1. Value of the Property

For property identified for acquisition, the subrecipient shall establish and document a property value based on market value, which is defined as:

> The amount in cash, or on terms reasonably equivalent to cash, for which in all probability the property would have sold on the effective date of the valuation, after a reasonable exposure time on the open competitive market, from a willing and reasonably knowledgeable seller to a willing and reasonably knowledgeable buyer, with neither acting under any compulsion to buy or sell, giving due consideration to all available economic uses of the property at the time of the valuation.[465]

The current market value reflects the property value at the time of purchase.

The following appraisal methodology must be used to determine property value:

- The appraisal must be conducted by an appraiser in accordance with the Uniform Standards of Professional Appraisal Practice.
- The appraiser must comply with relevant state laws and requirements and have the appropriate certification, qualifications and competencies based on the type of property being appraised.

B.7.4. TSUNAMI VERTICAL EVACUATION REFUGE: SUBAWARD IMPLEMENTATION

The following are basic steps in implementing an approved tsunami vertical evacuation refuge project:

1. Pre-construction (acquire land, if applicable, or obtain rights to use existing buildings/infrastructure for development of a tsunami vertical evacuation structure; carry out design process; seek technical consultant; prepare cost estimate; obtain construction permits including required environmental permits; hire construction manager/contractor).

[465] As defined by the *Uniform Appraisal Standards for Federal Land Acquisitions* (2016).

2. Hold project kickoff meeting.
3. Prepare site for construction.
4. Install new foundations or improve of existing foundations.
5. Construct new structure or modify existing structure in accordance with designs.
6. Pass inspections.
7. Achieve substantial completion of construction.
8. Obtain certificate of occupancy.

Post-award monitoring helps ensure that subapplicants/subrecipients are achieving the objectives of the federal award consistent with the performance goals and milestones described in the subaward. To assist the recipient in monitoring tsunami vertical evacuation refuge projects, the following milestone information or events should be included in Quarterly Progress Reports:

- If the subrecipient is acquiring contract support, the subrecipient should report when the request for proposal is completed, when the contract is out for bid, when the bid period closes, when proposals are reviewed, when the contractor is selected and the date of the kickoff meeting.
- Describe the current status including a summary of:
  - Recent progress and planned work.
  - Risks identified or changes from the milestones/deliverables submitted with the scope of work (e.g., financial concerns, coordination issues with state or local governments and utilities, project management or contracting issues, legal disputes, and significant changes impacting construction activities or timelines such as delays due to weather, materials, procurement or labor issues).
  - When construction has started, is substantially complete or completed.
- If property is purchased, the report should provide property address, purchase price and date.
- Any other milestones that have been identified in the subapplication or agreed to or are required by the recipient.

B.7.4.1. Budget and Scope of Work Change

Recipients are required to report deviations from budget, project scope or objectives, in accordance with Part 8. Recipients must request prior approvals from FEMA for budget and program plan

revisions.[466] If the final design is not complete prior to award, once the project is awarded, the design must be finalized by a licensed design professional and verified by an independent, qualified peer reviewer who is approved by the authority-having jurisdiction. Any changes to the scope of work or budget because of completing the final design or to address permitting requirements must be consistent with Part 8. Construction design activities are defined as construction activities; therefore, budget changes involving them must be consistent with Part 8.F.2.

B.7.5. TSUNAMI VERTICAL EVACUATION REFUGE: CLOSEOUT

Recipients and subrecipients must closeout projects in a timely manner consistent with Part 9.

In addition to the typical HMA program closeout procedures, closeout of tsunami vertical evacuation projects generally includes:

- Photos of the project site before and after construction.
- Latitude/longitude of the project site to the nearest sixth decimal place.
- A vicinity map, map of the SFHA if applicable, and Tsunami Design Zone map showing the extent of inundation by a Maximum Considered Tsunami, as defined by Chapter 6 of ASCE/SEI 7.
- Certification from a licensed professional engineer or architect that the vertical evacuation refuge structure and all items that contribute to its operation have been constructed to meet or exceed FEMA P-646 and ASCE/SEI 7 requirements.
- Any structural and non-structural design peer review reports as required by the latest published editions of FEMA P-646 and ASCE/SEI 7.
    - The peer review purpose is to have another person review the design and construction documents of the safe room to ensure it meets FEMA design standards. If issues are found in the design of the tsunami vertical evacuation refuge, it can be addressed and resolved.
    - The peer review must be completed by an independent licensed professional engineer or architect. It cannot be the same design professional providing the design oversight of the tsunami vertical evacuation refuge.
    - The peer reviewer will review the structural design, occupancy, means of egress, access and accessibility, fire safety and essential features of the tsunami vertical evacuation refuge.

[466] 2 CFR § 200.308

- An operations and maintenance plan that includes, at a minimum:
  - How the vertical evacuation refuge will open after a warning.
  - How the vertical evacuation refuge will operate, including a plan for pets.
  - Type and quantity of stocked supplies and where they will be stored.
  - How people will leave the refuge when the threat is over.
  - A regular maintenance plan.
- Information demonstrating that the completed project will be maintained to achieve the proposed hazard mitigation.
- A description of the post-closeout maintenance activities that will be undertaken to maintain the refuge.
- The period of time the community is committing to maintain the refuge, which must be consistent with the project useful life in the BCA.
- The department and job position that will be responsible for the refuge.
- Estimated costs for annual maintenance of the refuge.
- The schedule for completion of the maintenance activities.

B.7.6. TSUNAMI VERTICAL EVACUATION REFUGE: RESOURCES

Tsunami Vertical Evacuation Refuge Resources

- FEMA BCA: https://www.fema.gov/grants/guidance-tools/benefit-cost-analysis
- FEMA EHP review job aids: https://www.fema.gov/grants/guidance-tools/environmental-historic/preparation-resources
- FEMA P-646, *Guidelines for Design of Structures for Vertical Evacuation from Tsunamis:* https://www.fema.gov/sites/default/files/2020-08/fema_earthquakes_guidelines-for-design-of-structures-for-vertical-evacuation-from-tsunamis-fema-p-646.pdf
- ASCE/SEI 7 (latest published edition): https://www.asce.org/communities/institutes-and-technical-groups/structural-engineering-institute/asce-7-and-sei-standards/
- Tsunami geodatabase: https://asce7tsunami.online/

B.8. Safe Room

B.8.1. SAFE ROOM: OVERVIEW

HMGP, HMGP Post Fire and BRIC may provide assistance for residential and community safe rooms for tornadoes and hurricanes. Safe rooms provide immediate life-safety protection for a limited population that cannot evacuate out of harm's way before an event. Safe room projects include retrofits of existing facilities and new safe room construction. Assistance can be used for both single- and multi-use facilities.

BRIC, HMGP, and HMGP Post Fire assistance may only be used for safe room projects designed to achieve "near-absolute protection" as described in the latest published edition of FEMA P-361, *Safe Rooms for Tornadoes and Hurricanes: Guidance for Community and Residential Safe Rooms, Fourth Edition* (April 2021). Any lower threshold of protection exposes safe room occupants to a greater degree of risk than is acceptable. FEMA P-320, *Taking Shelter from the Storm: Building or Installing a Safe Room for Your Home, Fifth Edition* (March 2021), provides guidance and prescriptive plans for residential safe rooms, but refers to FEMA P-361 for the criteria. Therefore, the HMA Guide uses FEMA P-361 as the basis for safe room design requirements.

Safe rooms may also be designated to serve as recovery shelters, but only features required for the safe room functionality will be eligible for BRIC, HMGP or HMGP Post Fire assistance. BRIC, HMGP and HMGP Post Fire safe room assistance is not available for facilities that will solely be used as general population shelters, including evacuation and recovery shelters. Safe rooms and general population shelters are different in two ways. First, general population shelters are generally not intended to withstand extreme wind events and therefore do not provide near-absolute protection consistent with residential and community safe room criteria in FEMA P-361. Also, general population shelters are intended to provide longer-term services and housing for people who have left the anticipated impact area after a disaster event; safe rooms are intended to provide protection for a minimum of two hours in tornado events and 24 hours in hurricane events.

The planning and operation of BRIC, HMGP and HMGP Post Fire safe rooms must not conflict with state and/or local evacuation plans. BRIC, HMGP and HMGP Post Fire safe room projects must not be used as a substitute for, or as an option for individuals to ignore, local community and/or state evacuation plans or any other law or ordinance.

B.8.1.1. Hurricane Safe Room

When there is sufficient warning time in extreme wind events, such as hurricanes, the general population can be expected to leave the area of anticipated immediate impact and seek shelter outside of the impacted area. Therefore, for hurricane threats, FEMA considers providing assistance only for safe room projects designed for populations the state, local community and/or other authorities having jurisdiction indicates cannot remove themselves from harm's way before a hurricane that is anticipated to make landfall. This should normally be limited to first responders and continuity of operations essential staff; in rare geographic circumstances (such as island states or

territories where vehicle access to the continental U.S. by roadway is not available) it may include populations that cannot evacuate. The applicant and subapplicant must provide a basis for the intended population.

B.8.1.2. Tornado Safe Room

In extreme wind events, such as tornadoes, there may be little or no warning to allow the general population to leave the area of immediate impact, and they must, therefore, seek immediate life-safety protection. Little or no warning limits the potential occupancy of tornado residential and community safe rooms to the people who are on-site or nearby.

B.8.2. SAFE ROOM: ELIGIBILITY

FEMA requires applicants and subapplicants to design and site all hurricane or tornado saferoom projects in accordance with FEMA Funding Criteria in the latest publication of FEMA P-361 and latest edition of ICC 500, ICC/*National Storm Shelter Association Standard for the Design and Construction of Storm Shelters*, as minimum design criteria. The scope of work narrative must clearly state the hurricane or tornado saferoom will be designed to meet or exceed FEMA Funding Criteria, which are more conservative than code and standard minimum requirements provided in FEMA P-361.

B.8.2.1. Eligibility Criteria

FEMA will consider an extreme wind event mitigation activity, consisting of the retrofit or construction of a residential or community safe room (single- or multi-use), to be an eligible project type for HMGP, HMGP Post Fire and BRIC if:

- The safe room project provides immediate life-safety protection in the projected impact area of a hurricane and/or tornado.
- The safe room project is designed and constructed to meet or exceed the requirements in the latest published edition of the ICC 500 and the FEMA Funding Criteria in the latest published edition of FEMA P-361 (based on award agreement date) and is verified by a licensed design professional.
- The safe room project is not sited in FEMA-designated SFHAs, or if the saferoom project is located in a FEMA-designated SFHA area or the 500-year flood hazard area, but the 8-Step Decision Process was successfully completed for Executive Order (EO) 11988 on *Floodplain Management* (May 24, 1977), as amended by EO 13690 on *Establishing a Federal Flood Risk Management Standard and a Process for Further Soliciting and Considering Stakeholder Input* (Jan. 30, 2015), as provided by 44 CFR § 9.6 (i.e., the consultation with the local and state emergency management officials led to the conclusion that there is no

other feasible option than having the safe room project sited in an SFHA or the 500-year flood hazard area, as outlined in FEMA P-361).[467]

- The lowest floor of residential tornado safe rooms must be elevated to at least 1 foot above the Base Flood Elevation, the height required by the Federal Flood Risk Management Standard, or the minimum elevation required by the local floodplain ordinance or flood design requirements, whichever is highest.
- The safe room is designed and sized only to the extent necessary for the limited population that must remain in the impact strike area during an extreme wind event.
- The safe room is designed to accommodate occupants for a minimum duration time frame as required in FEMA P-361. Safe rooms must be sized according to the defined population that will use the facility during a storm event.
- Project costs are directly related to and necessary for the hazard mitigation purpose of providing immediate life-safety protection through the structure and the building envelope for the limited population required to remain in the impact area during an extreme wind event.
- For community saferooms, the subapplicant develops an operations and maintenance plan. At a minimum, the process to include operations and maintenance plans includes the following:
    - Descriptive statement of the operations and maintenance plan at the time of the application along with a statement of sssurances that the operations and maintenance plan will be developed during project implementation.
    - Final operations and maintenance plan prior to project closeout.
- The safe room project demonstrates cost-effectiveness.
- The safe room project complies with all relevant EHP regulations.
- The safe room project adheres to other program conditions as described in the HMA Guide.

B.8.2.2. Eligible Activities

Table 28 highlights eligible safe room activities.

[467] FEMA P-361

Table 28: Eligible Safe Room Activities

Eligible Activities	HMGP	HMGP Post Fire	BRIC	FMA
Hurricane residential safe room	Yes	Yes	Yes	No
Hurricane community safe room	Yes	Yes	Yes	No
Tornado residential safe room	Yes	Yes	Yes	No
Tornado community safe room	Yes	Yes	Yes	No

B.8.2.2.1. Populations Served by the Safe Room

FEMA will only consider subapplications for safe room projects that identify the safe room population that must remain behind or will not have time to leave and faces an imminent threat of a tornado, hurricane or both. The applicant or subapplicant will identify and quantify this population so the safe room's size can be verified during the subapplication review process. The size of the safe room is demonstrated by risk assessment information, such as information that is developed as part of a mitigation plan or evacuation plan.

The following information provides details to help applicants and subapplicants identify, quantify and document eligible populations needing hazard mitigation life-safety protection during extreme wind events. This section further describes categories of populations that are affected by tornadoes, hurricanes or both.

At a minimum, the applicant will demonstrate consideration of the following components in determining the eligible safe room population:

- Population to be protected within the area of impact by tornado and/or hurricane hazards.
- Warning capabilities, logistics and operation components that support basic safe room functions.
- Travel times and routes for the population to be protected to reach the safe room so that people are not exposed to additional risk when moving to the protected area.
- Hazard mitigation time of protection: minimum of two hours for tornadoes and 24 hours for hurricanes.
- Relationship of the population to be protected by the safe room to state or local emergency evacuation requirements.
- Effective and accessible warnings (alerts) that address the needs of individuals with disabilities and other access and functional needs and/or individuals who have limited English proficiency.

Community safe rooms are intended for a limited population, but the criteria for tornadoes and hurricanes differ in certain applications. When the limited population for tornadoes and hurricanes is identified, the respective mitigation activities must be considered separately and then combined (if both exist) using the most conservative requirements between the two. A combined safe room will have to comply with the larger square footage area per person and longer protection and with the more stringent debris impact protection. Characteristics such as the size of the targeted area, the warning time before the impact, and the duration of the storm affect the population requiring protection differently; therefore, the impacted population must be determined for each type of event.

Applicants and subapplicants must provide documentation to support the identified population for the safe room and must also submit adequate documentation in support of their risk assessments to allow grant program reviewers to determine whether the proposed safe room size is appropriate for the identified population. The documentation should be sufficiently detailed to be verified during the subapplication review process. Applicant and subapplicant coordination with the applicable federal, state or local (if applicable) agency responsible for developing emergency action plans is critical. In general, emergency response plans, evacuation plans, area maps, building construction drawings and meeting notes that can be used to quantify the population are acceptable. In addition, local or federally recognized tribal mitigation plans are required to describe the susceptibility of the community (especially high-risk populations) and structures, and they may also be sources for this information. The following sections identify issues to consider when applying for assistance for a hurricane, tornado or combined hazard community safe room. Applicants and subapplicants should select the most appropriate population for their safe room project using the steps described in the sections that follow.

B.8.2.2.1.1. POPULATION IMPACTED BY HURRICANES

Determining the hurricane safe room population depends on the assumptions used in the evacuation or emergency response plans and policies being administered by federal, state and local emergency management organizations. Therefore, applicants and subapplicants are encouraged to coordinate with the relevant agency in the jurisdiction that developed the plans. In addition, local or federally recognized tribal mitigation plans are required to include a risk assessment that defines the hazard characteristics within an area and the specific needs for the affected population. Evacuation plans are likely to be more specific in terms of population, but the risk assessment in a community's existing mitigation plan may also be a source for this information. Documentation to support the determination of the impacted population may be directly related to the planning tools mentioned above and should be included in the subapplication.

B.8.2.2.1.1.1. Hurricane Population Categories

Generally, two broad categories of potential hurricane safe room occupants may be identified as part of the limited population in need of life-safety protection: (1) first responders and continuity of operations essential staff and, in rare circumstances, (2) populations on island states or territories where vehicle access to the continental United States by a roadway is not available.

The impacted population must be accommodated within the safe room for a minimum of 24 hours (the FEMA P-361 minimum design occupancy time for hurricane safe rooms). Applicants and subapplicants are encouraged to use verifiable information, such as emergency evacuation plans and local emergency management plans (or other applicable sources), to identify potential safe room occupants from the categories listed below.

Category 1: First Responders, Critical and Essential Services Personnel, and Facility Occupants

The civilian personnel of emergency response services, also known as first responders, may be required to remain in harm's way. First responders include but are not limited to fire and police department personnel, rescue squads, emergency operations center personnel, emergency medical and ambulance service providers, search and rescue teams, and similar personnel whom a local community may depend upon for a successful response to an extreme wind event.

In many cases, other critical services personnel may be required to remain in harm's way to facilitate the continued operation of certain critical facilities, including material storage facilities, communications and data centers, and others that a local community may depend on for a successful response to an extreme wind event.

Category 2: Individuals Who Cannot Evacuate

This category may include occupants of facilities, such as patients in hospitals, residents of long-term care facilities and other occupants for which evacuation would be detrimental to their well-being. This category could also include prison populations that are unable to be evacuated safely, populations on island states or territories where vehicle access to the continental U.S. by a roadway is not available and who do not have the option to evacuate, or other vulnerable populations that cannot be easily moved.

B.8.2.2.1.1.2. Hurricane Travel Time Considerations

The issues to consider in estimating travel time to the safe room facility include local emergency management and law enforcement requirements, mandatory evacuations, evacuation times from the anticipated area of impact, and any other plans that affect the movement of at-risk populations. Further information is provided in FEMA P-361.

Occupants of one- and two-family dwellings with a residential safe room that meets the siting and elevation requirements in FEMA P-361 are assumed to use that room and require no evacuation and minimal travel time unless evacuation has been deemed mandatory by the authority having jurisdiction.

B.8.2.2.1.1.3. Hurricane Period of Protection

As identified in FEMA P-361, the hazard mitigation time of protection for safe rooms is a minimum of 24 hours for hurricane events. Therefore, any ancillary equipment required to operate during an

event for the safe room must also be properly sized and protected to the same level as the safe room.

B.8.2.2.1.1.4. Coordination with State/Local/Tribal/Territorial Evacuation Plans

In all cases, planning and operation safe rooms, including the identification of the population to be protected, must not conflict with state, local, tribal and/or territorial evacuation plans.

Safe room activities must not be used as a substitute or as an option for individuals to ignore state, local, tribal and/or territorial evacuation plans or any other law or ordinance.

B.8.2.2.1.1.5. Hurricane Warning Capabilities

In addition to design and construction criteria, an accessible and effective warning system must be in place to notify prospective community safe room occupants when they should evacuate to the safe room facility. Applicants and subapplicants for community safe room projects must demonstrate that the population can be properly notified to allow sufficient travel time to the community safe room.

B.8.2.2.1.1.6. Population Impacted by Tornadoes

Populations impacted by tornadoes are generally limited to the family or group of families who live in the dwelling or dwellings served by the safe room, workers or students who have access to a safe room at their place of business or school and individuals who have access to an on-site community safe room. Because of the short period between tornado identification and impact, these at-risk populations must be close to the safe room to benefit from it.

Tornado safe room populations are determined based on limited warning times (i.e., minutes) and the maximum reasonable travel time for potential safe room occupants to reach the safety of the facility. The populations that cannot reach the safe room within a reasonable time are not considered as potential occupants of the safe room.

The following two aspects of higher risk should be considered when identifying and quantifying the population impacted by a tornado:

- The physical characteristics of the built environment (buildings or other structures) in which the population resides. Because buildings differ in their susceptibility to damage from a tornado, building occupants are exposed to varying risks of injury or death. Individuals living in non-engineered, older and/or manufactured housing are more susceptible to catastrophic damage from a tornado.

- The ability of the population to mobilize to the safe room during a tornado, regardless of where they are located. Children and adults with disabilities and others with access and functional needs may require a greater level of assistance, time to mobilize and attention during an emergency. These considerations should be factored into planning.

B.8.2.2.1.1.7. Tornado Travel Time Considerations

The most effective tornado safe rooms minimize occupant travel time. Consequently, on-site community safe rooms, built either as integral parts of a building or as separate structures, offer the greatest level of protection to occupants. Community safe rooms in hospitals, schools, long-term care centers and other facilities that house highly susceptible populations are the most successful in minimizing the risks. These safe rooms may be designed to serve the community-at-large in addition to on-site residents. In such cases, the population of the safe room is limited by the proximity of potential occupants to the safe room, which is defined by the maximum allowed travel time and/or the maximum distance to the safe room.

The distance from the safe room for the at-risk population is based on a maximum walking travel time of five minutes, or 0.25 miles, or a maximum driving travel distance of approximately 0.5 miles. When considering a single- or multi-use community safe room, the five-minute walk time or the equivalent 0.5-mile driving distance must be calculated by the actual travel route or pathway that a pedestrian or a driver will be required to follow. Where intended occupants are coming from nearby buildings (e.g., school or hospital campuses with multiple buildings), a maximum distance of 1,000 feet between occupant-source buildings and the safe room entrance is recommended to allow time for egressing the occupant-source buildings. A 1,000-foot maximum distance from not fewer than one exterior door of each building to a door of the shelter serving that building may be required by building code for newly constructed safe rooms in some areas.

The pathway must not be restricted, bottlenecked or obstructed by barriers such as multilane highways, railroad tracks, bridges or similar facilities or by topographic features. Traffic congestion (including parking constraints) during the movement of the potentially affected population to the safe room once a storm watch/warning notification is issued should be considered when defining the limited population for the community safe room. In either case, whether walking or driving, prospective safe room occupants must be able to safely reach the facility within five minutes of receiving a tornado warning or notice to seek shelter.

B.8.2.2.1.1.8. Tornado Period of Protection

As identified in FEMA P-361, the occupancy duration in a tornado safe room is a minimum of two hours for a tornado event. Therefore, any ancillary equipment required to operate during an event for the safe room must also be properly sized and protected to the same level as the safe room.

B.8.2.2.2. Safe Room Sizing Criteria

The identified population directly affects the proposed safe room design size and is verified during the subapplicant review process. HMGP, HMGP Post Fire and BRIC assistance is provided only for the minimum size required to accommodate the identified population; costs for space that exceed the allowable size must be fully funded by non-FEMA sources and cannot be counted toward the federal cost-share of the award. HMA program safe room project subapplications are subject to usable floor area per occupant space requirements and size limitations identified in the design

criteria noted in this section. Table 29 identifies the minimum required usable floor area per safe room occupant consistent with FEMA-recognized design criteria.

Table 29: HMA Safe Room Minimum Usable Floor Area per Safe Room Occupant[468]

Types of Safe Room	Occupant	Minimum Usable Floor Area per Occupant* (square feet)
Tornado community safe room	Standing or seated	5
	Wheelchair user	10
	Relocated to a bed or stretcher	30
Hurricane community safe room	Standing or seated	20
	Wheelchair user	20
	Relocated to a bed or stretcher	40
Tornado residential safe room	One- and two-family dwelling	3
	Other residential	5
Hurricane residential safe room	One- and two-family dwelling	7
	Other residential	10

* For community safe rooms, at least one wheelchair user-sized space is required for every 200 occupants or portion thereof.

In addition to the square footage requirement per person, applicants and subapplicants must consider the normal functional use of the area. The type of durable medical equipment and furniture in the dual-purpose safe room will determine how to calculate the net usable area, which is the available area to be used by the occupants after reducing the non-usable area from the gross area.

For example, a community may decide to build a multi-use facility that includes a tornado safe room function in a community center. The new facility may include an assembly or multipurpose room that has 1,185 square feet. To use the space as a community tornado safe room, the gross square footage must be reduced to account for egress circulation, partitions, interior columns, furnishings, finishes, equipment and other features. The calculation may be exact or estimated using the methodology in FEMA P-361. For this example, the area is considered an open floor plan, and only 85% of the gross area can be considered net usable area for the occupants seeking shelter. Using

[468] Based on criteria from FEMA P-361 published April 2021. Verify requirements in most recently published edition of FEMA P-361.

85% of the gross square footage as usable square footage, the 1,185 square feet is reduced to 1,007 usable square feet:

$$1{,}185(0.85) = 1{,}007\ square\ feet$$

According to FEMA P-361 design criteria, a minimum of 5 square feet per safe room occupant must be provided in a tornado community safe room (refer to Table 29). In this example, safe room designers must also account for the use of durable medical equipment (e.g., wheelchairs, walkers or hospital beds).

A tornado community safe room must be sized to accommodate a minimum of one wheelchair space (at 10 square feet) for every 200 occupants or portion thereof. Therefore, the 1,007-square-foot usable floor area would provide enough space to protect 200 occupants (refer to Table 30) and would be eligible for HMGP, HMGP Post Fire and BRIC assistance. It would not be reasonable for an application in this example to include a request for usable square footage of 2,000 square feet because that amount of space has not been demonstrated as being necessary for an identified at-risk population of 200 occupants.

Table 30: Example Community Safe Room Size

Occupants	Required Square Feet per Person	Total Square Footage of Usable Floor Area
199 occupants	5	995
One occupant in wheelchair	10	10
Total 200 occupants	-	1,005

Applicants and subapplicants should refer to FEMA P-361 for further information on sizing criteria.

B.8.2.2.3. Flood Hazard Siting and Elevation Limitations

To be considered for assistance, HMGP, HMGP Post Fire and BRIC safe room projects must include maps or other documentation that identify the project location relative to the floodplain and meet FEMA Funding Criteria, flood hazard siting limitations and elevation requirements in FEMA P-361.

Except in special circumstances, safe rooms should not be sited in FEMA-designated SFHAs unless consultation with state and local emergency management officials concludes there is no other feasible option. If it is not possible to locate a safe room outside of the SFHA, precautions must be taken to ensure the safety and well-being of anyone using the safe room. If a saferoom is sited in a SFHA, there are additional design and siting requirements, such as elevation, that must be addressed. Refer to the latest published edition of FEMA P-361 for design and siting criteria.

B.8.2.2.4. Americans with Disabilities Act Compliance for Community Safe Rooms

The needs of the whole community requiring safe room space must be considered. Safe room construction should integrate considerations for:

- Proximity of location to affected populations.
- The size of the safe room.
- Egress/ingress of the safe room to accommodate the affected populations.
- Ensuring facilities within the safe room comply with ADA regulations, such as toilets or hand-washing stations.
- Accessible alerts and warnings.
- Appropriate access for persons with disabilities, which must be provided in accordance with all federal, state and local ADA requirements and ordinances.

Safe room subrecipients should be aware that accessibility provisions of the applicable code may exceed the minimum requirements of the ADA. For example, provisions for accessible routes connecting multistory buildings in Section 1104.4 of the 2021 IBC are more extensive than similar criteria in the ADA.

B.8.2.3. Ineligible Activities

HMGP, HMGP Post Fire and BRIC assistance is not available for general population shelters, including evacuation and recovery shelters. The emergency management measures necessary to afford protection to thousands of occupants of large, public venues, such as stadiums or amphitheaters, are beyond the scope of BRIC, HMGP and HMGP Post Fire community safe rooms; therefore, general population shelters are not eligible for assistance under BRIC, HMGP or HMGP Post Fire.

A general list of ineligible activities is included in Part 4.

B.8.2.4. Operations and Maintenance Plans for Community Safe Rooms

To be considered for assistance, HMGP, HMGP Post Fire and BRIC community safe room project subapplications must include a written statement acknowledging the requested community safe room will be operated and maintained in a manner that achieves the proposed hazard mitigation. FEMA will only consider operations and maintenance plans that have considered the guidance in FEMA P-361. Operations and maintenance plans are not required for residential safe rooms.

Community safe rooms are built and operated to provide immediate life-safety protection during extreme wind hazards. To achieve this purpose, community safe rooms must be built to the design criteria and be operated and maintained so that they are able to provide intended occupants with

the timely protection and services that they need. Subapplicants must provide an operations and maintenance plan statement of assurances with the safe room project subapplication acknowledging the requested community safe rooms will be operated and maintained in a manner that achieves the proposed hazard mitigation.

The steps in meeting the operations and maintenance plan requirements are as follows:

1. The subapplicant develops a description of the operations and maintenance plan that includes an assurance that the plan will be developed during project implementation and includes the description in the subapplication. The operations and maintenance plan description must include:
    a. A description of the maintenance procedures.
    b. A brief statement about the operation of the safe room when it is in use.
    c. Basic information about how the safe room will be used, including how use is initiated, the warning system, and basic procedures for opening the doors to the public.
    d. Key components of the safe room maintenance procedures.
    e. The office that will be responsible for the operations and maintenance of the safe room.
    f. Assurance the operations and maintenance plan will be developed and completed before project closeout.
2. The subrecipient develops the operations and maintenance plan.
3. Prior to closeout, the recipient and FEMA review the subapplicant's final signed operations and maintenance plan. The community safe room inventory in the operations and maintenance plan must include essential equipment and supplies, such as communications equipment, emergency equipment, first-aid supplies, water and sanitary supplies.

B.8.2.4.1. Development of an Operations and Maintenance Plan

The development of an operations and maintenance plan should be coordinated with the appropriate entities using and operating the community safe room and should be signed by authorized officials in these organizations.

The operations and maintenance plan may be based on preliminary engineering drawings and must include, at a minimum, the components listed below. FEMA P-361 provides guidance and best practices on operations and maintenance plan components. The required components of a plan are summarized below.

B.8.2.4.2. Operations Components

The operations components of an operations and maintenance plan must include the following, at a minimum:

- Community organization(s) responsible for operating and maintaining the community safe room, such as the local emergency management office, and contact information for the relevant office(s).
- Command and management roles and responsibilities for key individuals, such as the safe room manager and site coordinator, and their essential duties and/or the agency responsible for fulfilling these roles.
- Major tasks that the safe room management team will perform during a tornado/hurricane watch issued by the National Weather Service.
- General operation tasks in the community safe room from the time the emergency is announced to the time occupants may safely leave.

B.8.2.4.3. Maintenance Components

The maintenance components of an operations and maintenance plan should include assurance from the organization responsible for operating and maintaining the community safe room of the following during the useful life of the community safe room:

- Non-mitigation uses will not prohibit the use of the community safe room to perform its hazard mitigation purpose of life-safety protection (i.e., the safe room will not be used for storage or other activities that would reduce the available occupancy/space).
- A designated party will schedule and perform regular maintenance during the useful life of the community safe room.
- Basic exterior and interior signage will be posted as necessary and appropriate for adequate safe room operations.
- A redundant power source, such as batteries or generators, will be available to provide standby (emergency) power for lighting and ventilation for the community safe room in the event of primary power failure, as required.

B.8.2.5. Review of Final Operations and Maintenance Plan

FEMA requires that the recipient affirm that the final operations and maintenance plan meets the FEMA P-361 requirements by following the steps below:

1. Review the final operations and maintenance plan to ensure it addresses the operations and maintenance components.

2. Coordinate with the subrecipient to address any missing components.
3. Transmit the final operations and maintenance plan to FEMA with a written statement affirming that it is consistent with FEMA P-361 guidance.

FEMA will review the plan and inform the recipient in writing once it has determined that the final plan has all the required components. FEMA's comments on the final operations and maintenance plan must be addressed before FEMA makes a final determination of consistency. Recipients not completing a final operations and maintenance plan at closeout will be subject to the recoupment of award assistance as determined by FEMA.

B.8.2.6. Cost-Effectiveness

Applicants and subapplicants must demonstrate that mitigation projects are cost-effective. Projects must be consistent with Part 5.

HMGP, HMGP Post Fire and BRIC safe room project subapplications must demonstrate project cost-effectiveness using one of the methodologies described in Part 5. Pre-calculated benefits may only be used for tornado residential safe rooms.

This section discusses the total project costs required to demonstrate compliance with cost-effectiveness requirements. The total project cost for BCA purposes is the sum of all eligible costs necessary to achieve life-safety protection. Eligible project costs generally include:

- Design activities.
- Site preparation and building foundation materials and construction.
- Structural systems capable of resisting the design wind loads (including roof and wall framing).
- Protective envelope components such as walls, ceiling/roof systems and impact protective systems (doors, shutters).
- Other retrofit hardening activities that meet FEMA-approved performance criteria.
- Functional components such as permanent electrical lighting, heating, ventilation, air conditioning, and toilets and hand-washing facilities consistent with FEMA P-361 criteria; fire suppression sprinkler systems; and signage, emergency communications equipment and backup power generation for the safe room area.
- Operations and maintenance plan development.
- Costs associated with the acquisition of land.

In some cases, the total project cost of a safe room for a large community may exceed HMGP, HMGP Post Fire or BRIC limits. In these cases, the actual total project cost must be used in the BCA. The

program funding limit (which would be less than the actual project cost) may not be used as the total project cost entered into the BCA. Similarly, some applications may not request HMGP, HMGP Post Fire and BRIC assistance up to the available federal cost share. In these cases, the BCA must still use the sum of all required (not just requested) costs necessary to achieve the hazard mitigation purpose of immediate life-safety protection.

B.8.2.6.1. Tornado Residential Safe Room Pre-Calculated Benefits

Tornado residential safe rooms have different requirements than community tornado safe rooms. Unlike community safe rooms, tornado residential safe room construction projects may use pre-calculated benefits to demonstrate cost-effectiveness methodology.

Applicants must use the Expedited HMGP Application for Residential Safe Rooms to apply for pre-calculated benefits under HMGP and HMGP Post Fire. The pre-calculated benefit provides standardized BCA benefit values associated with residential safe rooms so that individual BCAs are not required as long as the project costs do not exceed the benefits (shown in Table 31). A safe room that costs less than the value indicated for the state where it is located is automatically considered cost-effective. For subapplications that contain multiple structures, the average cost of all structures in the project must be less than the value provided below. For additional information, refer to the *Safe Room Project Application Using Pre-Calculated Benefits* FEMA job aid.

For up-to-date information on the dollar value of the pre-calculated benefit, refer to the FEMA "Benefit-Cost Analysis" webpage.

Table 31: Tornado Residential Safe Room Aggregate Benefits by State

State	Aggregate Benefit	State	Aggregate Benefit
Alabama	$13,336.96	Nebraska	$9,921.78
Arkansas	$16,717.85	North Carolina	$5,723.26
Georgia	$5,290.98	Ohio	$11,469.38
Illinois	$13,685.72	Oklahoma	$18,366.36
Iowa	$14,962.87	Pennsylvania	$4,065.90
Indiana	$18,126.34	South Carolina	$6,139.38
Kansas	$14,005.75	South Dakota	$5,230.17
Kentucky	$13,554.96	Tennessee	$13,579.58
Louisiana	$9,921.94	Texas	$5,421.32
Michigan	$6,522.49	Virginia	$3,936.05
Missouri	$15,654.96	West Virginia	$4,973.50

State	Aggregate Benefit	State	Aggregate Benefit
Mississippi	$20,067.64	Wisconsin	$9,025.48
Minnesota	$7,092.39		

B.8.2.7. Feasibility and Effectiveness

Projects must be consistent with Part 4. Mitigation projects assisted by HMA must be both feasible and effective at mitigating the risks of the hazard(s) for which the project was designed. A project's feasibility is demonstrated through conformance with accepted engineering practices or established codes, standards, modeling techniques or best practices.

B.8.2.7.1. Codes and Standards

To qualify for HMGP, HMGP Post Fire or BRIC assistance, a safe room must be designed and constructed to meet the requirements and FEMA Funding Criteria in FEMA P-361 (refer to Appendix D). Applicants must submit documents that include a statement that safe room design conforms to the provisions of the latest editions of ICC 500 and FEMA P-361.

In addition, all HMA-assisted safe room projects in flood hazard areas must also comply with the requirements established by the Federal Flood Risk Management Standard. Refer to Part 4.I for more information about these requirements.

B.8.2.8. Environmental and Historic Preservation

All subapplications submitted to FEMA must meet the EHP criteria in Part 4. All subapplications must provide the information described in Part 6 so that FEMA may perform the EHP review.

To assist with the EHP review, FEMA has prepared a Programmatic Environmental Assessment to help project application developers and reviewers streamline the evaluation of potential impacts to the human environment resulting from the construction of residential and community safe rooms that are proposed for HMGP, HMGP Post Fire or BRIC assistance. The Programmatic Environmental Assessment provides the public and decision-makers with helpful information necessary to understand and evaluate the potential environmental consequences of these hazard mitigation actions and helps streamline the National Environmental Policy Act review process.

The *Safe Rooms–Required Information for EHP Review* FEMA job aid lists the documentation needed for FEMA to complete the EHP compliance review process for projects.

B.8.2.9. National Flood Insurance Program Eligibility Requirements

Mitigation projects sited within the SFHA are eligible only if the jurisdiction is participating in the NFIP. For more information, refer to Part 4.J.

B.8.2.10. Special Flood Hazard Area Requirements

For structures in the SFHA at the completion of the project, flood insurance must be maintained for the life of the property.[469] For more information, refer to Part 4.J.

B.8.3. SAFE ROOM: APPLICATION AND SUBMISSION INFORMATION

All subapplications submitted to FEMA must meet the eligibility criteria in Part 4. All subapplications must have a scoping narrative in accordance with Part 6. Project-specific criteria are highlighted below.

FEMA may request additional information after the subapplication has been submitted to ensure all necessary information is received. However, all information required by the regulations and the HMA Guide must be received before an assistance decision and award or final approval can be made.

The subapplication must include the following identification of the impacted population:

- Documentation on the composition, size and rationale for including each group designated as a disproportionately impacted population.
- Description of warning capabilities, logistics and operation components that support basic safe room functions.
- Documentation that demonstrates how the designated population would reach the safe room within the prescribed time limit after notification as required by FEMA P-361 (for tornado residential and community safe rooms).
- If land acquisition is proposed, the current value of property and documentation demonstrating how the market value was determined.
- For community safe rooms, description of the approach the subapplicant will use in preparing the operations and maintenance plan.

B.8.3.1. Activities and Schedule

As part of the scope of work, all subapplications must include an activities description referencing industry standards or project plans and specifications and a schedule for the project. Additionally, a scope of work must include work activities, deliverables and timelines associated with a project.

B.8.3.2. Clear Title

If property acquisition is proposed, the subrecipient must conduct a title search for the property it plans to acquire. The purpose of the title search is to ensure the owner is the sole and actual titleholder to the property, to identify other persons with a property interest if the owner is not the

[469] 42 U.S.C. § 4012a(a)

sole and actual titleholder and to ensure the title is clear (i.e., no mortgages or liens are outstanding on the sale of the property).

The subapplicant should document the process they will use to gain the necessary state and local approvals to construct a community saferoom, prior to the purchase of the property.

Other title-related requirements are as follows:

- A title insurance policy demonstrating the clear title must be obtained for each approved property that will be acquired.
- A physical site inspection for each property must be conducted to verify there are no physical encumbrances to the property (a site survey may be necessary to clearly establish property boundaries).
- The property title must be transferred by a warranty deed in all jurisdictions that recognize warranty deeds.
- The subrecipient must take possession at settlement.
- The subrecipient must record the deed at the same time as settlement along with any program deed restrictions.
- The deed transferring title to the property and the program deed restrictions will be recorded according to state law and within 14 calendar days after the settlement.

B.8.3.3. Eligible Costs

Eligible costs for BRIC, HMGP and HMGP Post Fire assisted safe room projects are costs for project components (e.g., design, construction, project management) that are related directly to and necessary for the hazard mitigation purpose of providing immediate life-safety protection by means of the structure and the building envelope to the limited population that must remain in the impact area during an extreme wind event.

For each structure type, eligible project costs are limited to:

- **Protection by design components**, including the safe room envelope and impact protective systems (walls, ceilings, doors, windows, as specified in FEMA P-361, ICC 500 and applicable local building codes).
- **Ancillary components** required by FEMA P-361, including standby (backup) power, communications and emergency electrical lighting limited to within the safe room, as well as protection of ancillary components to the same degree as the safe room.
- **Design and construction components** for safe room portion only, including engineering fees, permit fees, special inspection fees and excavation.

- **Required features** necessary for safe room function and habitation, including ventilation, permanent electrical lighting, and ADA requirements such as accessible toilets and hand-washing stations.

B.8.3.4. Ineligible Costs

Costs associated with providing facilities for any function that is not essential for life-safety protection of occupants are not eligible. If a safe room facility can fulfill its basic function of life-safety protection for occupants during a storm without a building feature or component that provides conveniences or additional comfort, costs associated with that feature or component are not eligible. Examples are flooring, seating and food preparation facilities. This is a significant issue in multi-use community safe rooms, which are designed to provide other functions that are not eligible for funding.

Table 32 shows examples of eligible and ineligible components of residential and community safe rooms. This table can be referred to when determining whether a component is an eligible cost of a safe room application. Note there are differences in what is considered an eligible cost for a residential safe room versus a community safe room because of the different scope of the projects. Some items for multi-use safe rooms may be prorated based on safe room-specific occupancy.

Table 32: Eligible and Ineligible Components of Residential and Community Safe Rooms

Building Systems and Components	Residential	Community
Structural systems that directly support or protect the safe room to provide near-absolute life-safety protection	Yes	Yes
Impact protective systems (doors, windows and other opening protection)	Yes	Yes
Protection of backup mechanical, electrical, ventilation and communication equipment necessary to provide life safety for the safe room	Yes	Yes
Safe room signage	Yes	Yes
Communications, including Local Area Network drops and wiring if used for emergency communication during an event	Yes	Yes
Construction permit fees	Yes	Yes
Alternate source of power for the safe room	Yes	Yes
First aid supplies and equipment to meet safe room occupancy requirements	Yes	Yes
Fire suppression systems (sprinklers systems and fire extinguishers)	No*	Yes
Electrical lighting and outlets	Yes	Yes

Building Systems and Components	Residential	Community
ADA requirements	Yes	Yes
Ventilation	Yes	Yes
Heating, ventilation and air conditioning used for required ventilation	Yes	Yes
Heating, ventilation and air conditioning not used for required ventilation	No	No
Accessible toilets and hand-washing stations in safe room	No	Yes
Planning/engineering/architecture design fees	Yes	Yes
Engineering study to calculate undefined flood elevations	Yes	Yes
Engineering peer review	Yes	Yes
Site preparation	Yes	Yes
Inspections, including special inspections	Yes	Yes
Soil test	No	Yes
Storage room for food, water and safety equipment	No	Yes
Purchase of land (market value of the real property [land and structures] at the time of sale)	No	Yes
Fees for necessary appraisals, title searches, title insurance, property inspections, permit fees, and surveys	No	Yes
Fees associated with the title transfer and contract review, and other costs associated with conducting the real estate settlement, including recordation of the deed and deed restrictions	No	Yes
Property tax liens or tax obligations that can be extinguished with proceeds from property sale while performing the transfer of title	No	Yes
Safe room maintenance	No	No
Restroom fixtures not required by code or FEMA P-361	No	No
Paint on walls and ceilings of safe room	No	No
Floor coverings – subfloors not required for life safety	No	No
Removal of structures from developed land	No	No
Kitchen cabinets, countertops and other equipment not required for life safety	No	No
Security cameras and emergency operations center-type equipment	No	No

Building Systems and Components	Residential	Community
Landscaping	No	No
Parking and all non-building elements unless required for ADA compliance	No	No

* Eligible if required by local codes

B.8.3.5. Budget

All subapplications must include a line-item breakdown of all anticipated costs. Refer to Part 6 for more information.

Subapplicants may apply for subrecipient management costs to cover administrative costs. Management costs must be included in the subapplication budget as a separate line item. More information about the requirements for management cost requests can be found in Part 13.

Applications for safe room projects must include detailed line-item costs in the project budgets. Well-documented project budgets contain quantities, unit costs, and a source for each unit cost. In contrast, lump-sum estimates do not provide quantities and unit costs required to evaluate the accuracy of the project budget. Lump-sum estimates are not acceptable.

HMGP, HMGP Post Fire and BRIC project budgets include unit costs related to the proposed square footage of the protected area or areas of the safe room. Unit costs may also be related to the protected population (occupants) of the safe room.

B.8.3.5.1. Value of the Property

For property identified for acquisition, the subrecipient shall establish and document a property value based on market value, which is defined as:

> The amount in cash, or on terms reasonably equivalent to cash, for which in all probability the property would have sold on the effective date of the valuation, after a reasonable exposure time on the open competitive market, from a willing and reasonably knowledgeable seller to a willing and reasonably knowledgeable buyer, with neither acting under any compulsion to buy or sell, giving due consideration to all available economic uses of the property at the time of the valuation.[470]

The current market value reflects the property value at the time of purchase. The following appraisal methodology must be used to determine property value:

- The appraisal must be conducted by an appraiser in accordance with the Uniform Standards of Professional Appraisal Practice.

[470] As defined by the *Uniform Appraisal Standards for Federal Land Acquisitions* (2016).

- The appraiser must comply with relevant state laws and requirements and have the appropriate certification, qualifications and competencies based on the type of property being appraised.

B.8.4. SAFE ROOM: SUBAWARD IMPLEMENTATION

The basic steps in implementing an approved HMA safe room project are:

1. Pre-construction (acquire land, if applicable, or rights to modify a portion of an existing structure; carry out design process; seek technical consultant; prepare cost estimate; obtain building permits; hire construction manager/contractor).
2. Before construction begins, obtain copies of submittal documents (e.g., plans and specifications) and peer-reviewed report and quality assurance plan as required to be provided to the authority having jurisdiction (e.g., building official) in accordance with the latest editions of ICC 500 and FEMA P-361. Note that FEMA Funding Criteria requires a statement be included with the submittal documents that states the design conforms to (1) the provisions of ICC 500 with the edition year specified and (2) the FEMA Funding Criteria of FEMA P-361 with the edition year specified.
3. Clear/prepare site and install erosion control measures to prepare for construction activities.
4. Construct or install saferoom in accordance with all guidance and codes.
5. Conduct inspections and obtain certificate of occupancy.
6. Prepare the operations and maintenance plan.

Post-award monitoring helps ensure subrecipients are achieving the objectives of the federal award consistent with the performance goals and milestones described in the subaward. To assist the recipient in monitoring safe room projects, the following information should be included in Quarterly Progress Reports:

- If the subrecipient is acquiring contract support, the subrecipient should report when the request for proposal is completed, when the contract is out for bid, when the bid period closes, when proposals are reviewed, when the contractor is selected and the date of the kickoff meeting.
- Describe the current status including a summary of:
    - Recent progress and planned work.
    - Risks identified or changes from the milestones/deliverables submitted with the scope of work (e.g., financial concerns, coordination issues with state or local governments and utilities, project management or contracting issues, legal disputes, and significant changes impacting construction activities or timelines such as delays due to weather, materials, procurement or labor issues).

- When construction has started, is substantially complete or completed.
- Describe planned and completed peer reviewed and inspection activities.
- If property is purchased, the report should provide property address, purchase price and date.
- Any other milestones that have been identified in the subapplication or agreed to or are required by the recipient.

B.8.4.1. Budget and Scope of Work Changes

Recipients are required to report deviations from budget, project scope or objectives in accordance with Part 8. Recipients must request prior approvals from FEMA for budget and program plan revisions.[471] If the final design is not complete prior to award, once the project is awarded, the design must be finalized by a licensed design professional and verified by a peer review as required by FEMA P-361. Any changes to the scope of work or budget because of completing the final design or to address permitting requirements must be consistent with Part 8. Construction design activities are defined as construction activities; therefore, budget changes involving them must be consistent with Part 8.F.2.

B.8.4.2. Inspection Considerations and Peer Review

Safe rooms must have all required inspection and peer reviews as required in FEMA-361 and ICC 500. Safe rooms have significantly more administrative checks than other HMA projects. Recipients/subrecipients are encouraged to review code requirements to determine the inspection schedule/requirements throughout the construction process.

The peer review's purpose is for independent design professionals to review design and construction documents of the safe room to ensure it meets FEMA design standards. If issues are found in the design of the safe room, they can be addressed and resolved. The peer review typically involves multiple design professionals to adequately address all architectural and engineering disciplines.

The peer review must be completed by an independent registered design professional; they must not be the design professional providing design oversight of the safe room. The peer reviewer in charge must be hired by the safe room owner or owner's representative. The peer reviewer(s) must disclose any conflicts of interest (financial or otherwise) that could compromise the independence of the review to the authority having jurisdiction and must meet the requirements to be a peer reviewer outlined in FEMA P-361.

The peer reviewer will review the structural design, occupancy, means of egress, access and accessibility, fire safety and essential features of the safe room. Peer review is required to cover ICC

[471] 2 CFR § 200.308

500 Chapters 3, 4, 5 ,6 and 7 and Sections 106, 107, 110 and 111. Applicants and subapplicant should review FEMA P-361 and ICC 500 to determine which aspects of the project require peer review. This may require inspections and peer review before, during and after construction.

Following the review, the signed, sealed report must be submitted by the owner or owner's representative to the authority having jurisdiction of the recipient. The report should include detailed descriptions of the items reviewed and a recommendation of acceptance or rejection for each with an explanation provided for rejected items. The recipient will submit the peer review report as part of closeout.

B.8.5. SAFE ROOM: CLOSEOUT

Recipients and subrecipients must closeout projects in a timely manner consistent with Part 9.

The review of the completed saferoom must verify the safe room meets or exceeds FEMA P-361 and ICC 500 standards that were in force on the award date.

In addition to the typical HMA program closeout procedures, closeout of safe room projects generally includes:

- Documentation that completed projects provide the level of protection approved in the scope of work. This may be included as a part of the required statements and peer review reports to verify compliant design, structural observations and special inspections.
- Photographs of the project site before, during and after construction. Photographs should confirm the scope of work is completed and be taken from the inside of the structure(s) and saferoom(s). For community saferooms, photographs of bathrooms should be included. Photographs may be included in the inspection report.
- Latitude/longitude of each project site and safe room entrance(s) to the nearest sixth decimal place.
- For community safe rooms:
    - When required by FEMA P-361, any structural and non-structural design peer review reports from an independent registered design professional certifying the community safe room is designed to meet or exceed requirements.
    - A final, signed operations and maintenance plan.
    - Photos of the project site before and after construction. Photos should confirm the scope of work is completed.
    - Latitude/longitude of each project site and safe room entrance(s) to the nearest sixth decimal place.

- A vicinity map and map of the SFHA if applicable.
- A record of completed structural observations in accordance with ICC 500 and FEMA P-361 that includes:
  - A written statement from the registered design professional who performed the structural observations that the required site visits have been made. The statement must also identify any reported deficiencies that, to the best of their knowledge, have not been resolved.
  - Where special inspections are required, the statement of special inspections.
  - Where safe room construction included changes to specifications in the submittal documents, approved change orders and a final as-built set of construction drawings.
- A final operations and maintenance plan signed and dated by authorized officials for that community saferoom.

- For residential safe rooms:
  - For prefabricated safe rooms: The building official's approval of installation or signed statement from the installer that the safe room foundation capacity (including thickness, steel reinforcement and concrete cover) and post-installed foundation anchors (locations and capacities) meet or exceed the corresponding design information submitted in accordance with ICC 500 and FEMA P-361.
  - For site-built safe rooms: Where FEMA P-320 design plans are constructed, the professional engineer who reviews the selected plan and site conditions is required to sign and seal the design plan page SR0.0 of the prescriptive design plans in FEMA P-320, complete any missing information on page SR0.1 of the prescriptive design plans in FEMA P-320, and provide all approved field change orders.
  - Property site inventory listing properties that were mitigated including property address, parcel information and latitude/longitude coordinates to the nearest sixth decimal place for the main egress into the safe room for each property.
  - For properties located within the SFHA:
    - If applicable, a copy of the *Elevation Certificate* (FEMA Form 086-0-33).
    - Recorded deed for each mitigated property, indicating compliance with the *Acknowledgement of Conditions for Properties Using FEMA Hazard Mitigation Assistance*.

- Proof of appropriate level of flood insurance (such as a copy of the flood insurance policy).

B.8.5.1. Records Retention

All subrecipients must comply with Part 9.

The subrecipient should retain construction documents that are in support of FEMA-assisted work for the lifespan of the safe room.

B.8.6. SAFE ROOM: RESOURCES

Safe Room Resources

- FEMA BCA: https://www.fema.gov/grants/guidance-tools/benefit-cost-analysis
- FEMA EHP review job aids: https://www.fema.gov/grants/guidance-tools/environmental-historic/preparation-resources
- Expedited HMGP Application for Residential Safe Rooms: https://www.fema.gov/grants/mitigation/job-aids (search "safe rooms")
- *Safe Room Project Application Using Pre-Calculated Benefits*: https://www.fema.gov/media-library-data/1424368115734-86cfbaeb456f7c1d57a05d3e8e08a4bd/FINAL_SafeRoom_JobAid_13FEB15_508complete.pdf
- Safe Room Information and Resources: https://www.fema.gov/safe-rooms
- FEMA P-361, *Safe Rooms for Tornadoes and Hurricanes*: https://www.fema.gov/sites/default/files/documents/fema_safe-rooms-for-tornadoes-and-hurricanes_p-361.pdf
- FEMA P-320, *Taking Shelter from the Storm*: https://www.fema.gov/sites/default/files/documents/fema_taking-shelter-from-the-storm_p-320.pdf
- ICC 500, *Standard for the Design and Construction of Storm Shelters*: https://codes.iccsafe.org/content/ICC5002020
- *Closeout Toolkit: Checklist for HMGP Subawards*: https://www.fema.gov/sites/default/files/2020-09/fema_closeout_toolkit_checklist_hazard_mitigation_grant_program_subawards_02-19-15.pdf

B.9. Wildfire Mitigation

B.9.1. WILDFIRE MITIGATION: OVERVIEW

Wildfire mitigation projects are any actions undertaken to decrease the risk of damage or loss of life from wildfires. FEMA wildfire mitigation activities can be assisted by HMGP, HMGP Post Fire and BRIC. Assistance under these programs is not available for wildfire mitigation beyond the parameters described in the HMA Guide.

B.9.2. WILDFIRE MITIGATION: ELIGIBILITY

This section addresses project eligibility requirements and lists the types of projects that FEMA will assist.

B.9.2.1. Eligibility Criteria

FEMA assistance will only be considered for clearly defined vulnerable buildings and structures. Eligible wildfire mitigation projects must clearly demonstrate mitigation of the risk from wildfire to residential and non-residential buildings and structures, including public and commercial facilities. Projects must be in a Wildland Urban Interface, be adjacent to or intermingled with the built environment, and provide protection to life and the built environment from future wildfires. The Wildland Urban Interface is an area where human-made structures and infrastructure (e.g., cell towers, schools and water supply facilities) are in or adjacent to areas prone to wildfire.

B.9.2.2. Eligible Activities

FEMA will only assist specific wildfire mitigation activities. These activities are summarized in Table 33.

Table 33: Eligible Wildfire Management Activities

Activity	HMGP	HMGP Post Fire	BRIC	FMA
Defensible space	Yes	Yes	Yes	No
Ignition-resistant building materials*	Yes	Yes	Yes	No
Ignition-resistant infrastructure**	Yes	Yes	Yes	No
▪ Ignition-resistant utility pole structures	Yes	Yes	Yes	No
▪ Repair/replace/upgrade water systems	Yes	Yes	Yes	No
Fire suppression system (sprinklers)***	Yes	Yes	Yes	No
Fuel reduction/vegetation management	Yes	Yes	Yes	No

Activity	HMGP	HMGP Post Fire	BRIC	FMA
Post-wildfire flooding prevention and sediment reduction measures:	Yes	Yes	Yes	No
* Reforestation, restoration and/or soil stabilization	Yes	Yes	Yes	No
* Ground cover vegetation re-establishment (e.g., seeding and mulching)	Yes	Yes	Yes	No
* Erosion prevention measures on slopes	Yes	Yes	Yes	No
* Flash flooding prevention measures resulting from runoff (e.g., drainage dips and debris traps)	Yes	Yes	Yes	No
Installing warning equipment and systems†	Yes	Yes	Yes	No

* Only eligible if the property owner has completed or agrees to complete and maintain defensible space measures around the structure.
** Part 12.B.10 contains additional information on this project type.
*** Only external water hydration or thermal insulation systems are eligible.
† Part 12.B.12 contains additional information on this project type.

B.9.2.2.1. Defensible Space

Creating defensible space involves creating a perimeter around a residential or non-residential building or structure by removing or reducing the volume of flammable vegetation, including clearing tree branches vertically and horizontally. The volume of vegetation is minimized, flammable vegetation is replaced with less flammable species, and combustibles are cleared in accordance with all applicable codes and best practices. FEMA recognizes the importance of creating defensible space for residential and non-residential buildings and structures in accordance with local fire codes; standards and design criteria provided by ICC, FEMA, the Fire Administration and the NFPA; well-established and proven techniques; and NFPA Firewise practices. FEMA recommends that ingress and egress to the building be maintained.

The required radius of defensible space around a building is related to the degree of the hazard, and the radius that is needed for an effective defensible space may therefore vary from one jurisdiction or building to another. In addition, the topography, specifically slope steepness and direction, and the arrangement, amount and flammability of the vegetation may require extending the perimeter.

Defensible space projects for residential structures, commercial buildings, public facilities and infrastructure must be implemented in conformance with local code requirements and standards for defensible space. FEMA recommends that projects use the design guidance in FEMA P-737, *Home Builder's Guide to Construction in Wildfire Zones* (Sep. 2008) or FEMA P-754, *Wildfire Hazard Mitigation Handbook for Public Facilities* (Oct. 2008), if the latter presents a stricter standard.

B.9.2.2.2. Ignition-Resistant Building Materials

Structural protection through ignition-resistant construction involves the use of non-combustible or ignition-resistant materials, technologies, assemblies and retrofit techniques on new and existing buildings and structures.

FEMA will consider a subapplication for an ignition-resistant building materials project only when one of the following has occurred:

- The property owner has previously created defensible space and agrees to maintain the defensible space in accordance with the HMA Guide. The subapplicant must include documentation describing the defensible space for each property in the application. FEMA will provide assistance for ignition-resistant construction projects only after the subapplicant has demonstrated that the defensible space activity is complete and has provided documentation (i.e., photographs and description of the defensible space).

- The subapplication includes both the defensible space and ignition-resistant construction projects as part of the same subapplication. The subapplicant must include a description of the defensible space for each property in the subapplication, and each property owner must agree to maintain the defensible space in accordance with the HMA Guide.

The protection of homes, structures and critical facilities using ignition-resistant construction techniques or non-combustible building materials must be implemented in conformance with the local fire-related codes and standards. FEMA recommends that projects use the International Wildland Urban Interface Code, FEMA P-737 or FEMA P-754 as appropriate.

FEMA may assist above-code projects in communities if the project is cost-effective and in conformance with all applicable eligibility criteria. Eligible activities include:

- **Roof assemblies**: Installation of roof coverings; roof sheathing; roof flashing; roof skylights; roof, attic and wall vents; and roof eaves and gutters that conform to any of the following ignition-resistant construction standards: (1) construction materials are ignition-resistant in accordance with nationally recognized testing standards, (2) construction materials are non-combustible or (3) construction materials constitute an assembly that has a minimum one-hour fire-resistant rating.

- **Wall components**: Installation of wall components, such as the fascia, windows, window glazing, doors, window frames and insulation that conform to any of the following ignition-resistant construction standards: (1) construction materials are ignition-resistant in accordance with nationally recognized testing standards, (2) construction materials are non-combustible or (3) construction materials constitute an assembly that has a minimum one-hour fire-resistant rating.

- **Protection of fuel tanks**: Protection of propane tanks or other external fuel sources.

- External water hydration and thermal insulation systems: Purchase and installation of external, structure-specific water hydration and thermal insulation systems (foam, fire-retardant and water sprinkler systems) with a dedicated delivery system and dedicated self-contained foam or retardant in sufficient volume to protect the structure. For water sprinklers, a cistern is acceptable if a dry hydrant with a fire department connection or other water source (e.g., lake, river, swimming pool) is available. FEMA will only consider the project when assurance is provided in the operations and maintenance plan that a system (e.g., geographic information system) will be maintained to identify property addresses with wildfire sprinkler systems and will be made available to the appropriate fire department.

B.9.2.2.3. Fire Suppression System (Exterior Sprinklers)

During a wildfire, firebrands and airborne debris can breach windows, and convective heat and embers can penetrate utility openings, gaps around doors and other openings. Exterior water hydration systems can help extinguish flames before the building has been substantially damaged, protect nearby buildings and prevent the fire from igniting nearby combustible vegetation.

B.9.2.2.4. Fuel Reduction/Vegetation Management

Hazardous fuels reduction involves the removal or modification of vegetative fuels proximate to the at-risk buildings or structures that, if ignited, pose a significant threat to human life and property, especially critical facilities. Hazardous fuels reduction includes thinning vegetation, removing ladder fuels, reducing flammable vegetative materials and replacing flammable vegetation with fire-resistant vegetation for the protection of life and property. Vegetation may include excess fuels or flammable vegetation.

Hazardous fuels reduction projects are implemented at the community level and extend beyond defensible space perimeters.

Hazardous fuels reduction projects will be designed to moderate fire behavior and reduce the risk of damage to life and property in the target area for mitigation. The natural variation in vegetation, topography and climate does not lend itself to a national design standard for hazardous fuels reduction activities. Hazardous fuels reduction projects will be designed and implemented in accordance with state and local codes and standards and best practices. The project design should include consideration of the landscape and intended function of the project, and the location and orientation of the project site should be designed with consideration of the likely direction and severity of a wildfire.

Hazardous fuels reduction may be accomplished using community-owned, rental or contract resources and equipment for mechanical treatments, such as disking, mowing, limbing, sawing, chipping, grinding, mulching and chopping. Chopping equipment may include chippers and saws. The equipment may not pose a risk of fire ignition (e.g., by using a spark arrestor).

Eligible activities include community-level vegetation management, vegetation removal, vegetation clearing and/or thinning, slash removal and vertical and horizontal clearance of tree branches to

reduce the threat to human life and structures from future wildfires. Hazardous fuels reduction may include the following techniques:

- Chemical treatments, including herbicide applications with appropriate safeguards to ensure protection of human life, the environment and watersheds.
- Grazing or biomass conversion.
- Mechanical treatments, such as disking, mulching, chipping, grinding, mowing, limbing, chopping and removal of such material; material left on-site must meet appropriate depth practices in accordance with applicable codes and best practices.
- Biomass removal, including clearing straw, removing dead or dry vegetation, thinning, removing brush and pine straw, or removing blown-down timber from wind throw, ice or a combination.
- Biomass burning, including gathering vegetation into a pile for burning.
- Felling of standing burned trees and other hazardous trees perpendicular to a slope to help prevent erosion.
- Other industry-accepted techniques with FEMA's approval.

B.9.2.2.5. Post-Wildfire Flooding Prevention and Sediment Reduction Measures

Wildfires can leave slopes bare of vegetation, making them subject to erosion. Wildfires also can change the chemical composition of the surface soils, making them hydrophobic, which means they repel water rather than absorb it. Consequently, periods of intense and/or extended rainfall after a wildfire can result in runoff that could result in flash floods, debris slides and mudslides, which could pose a threat to life and property at the bottom of the slope.

Post-wildfire flooding preventive measures can be implemented to protect property at the base of slopes with hydrophobic soils because of wildfire. These measures may direct water away from the property and slow the flow of water down the slope. Post wildfire sediment reduction prevention measures are meant to mitigate the risk of sediment and mud flows after a wildfire has burned a watershed. Wildfires create the potential for landslides, mudflows and sediment flows, which increase the debris and sediments during flooding events. Prevention measures to mitigate the amount of sediment in post-wildfire runoff include the use of rock or log dams and sediment debris traps.

Flash flooding preventive measures are meant to mitigate risk of flooding after a wildfire event has burned the watershed upstream of a project area. Wildfires increase the risk of flooding by reducing the vegetation and increasing the ability of the soils in the watershed to retain water. These preventative measures include:

- Diversion channels (artificial channels built to reduce excess water flow) or deflection walls (generally reinforced concrete structures that can protect bridge abutments) can be used to slow and redirect the flow and movement of water across a slope rather than directly downward to a stream or wetland.
- Drainage dips (intentionally reverse grade built into a roadway) can divert water flow from the surface and direct it instead toward a discharge area.
- Emergency spillways (drainage channels constructed for discharge surplus water) can keep roads and bridges from washing out during floods.
- Water bars (berms of soil, straw, rock or bedded logs placed perpendicular to the slope) can protect against erosion, run off, and high water by preventing water from overcoming the slope.
- Culvert modifications and or removal to channel water off the burn region.

B.9.2.3. Ineligible Activities

The following project activities and their associated costs are not eligible for FEMA assistance:

- Projects that do not protect homes, neighborhoods, structures or infrastructure.
- Activities associated with facilities or land owned by another federal entity where the specific authority relating to the activities lies with another federal entity.
- Projects to address ecological or agricultural issues related to land and forest management (e.g., insects, diseases, infestations, damage from extreme weather events affecting the forest-wide health).
- Irrigation of vegetation to avoid disease or drought-related infestation.
- Projects to protect the environment or watersheds.
- Projects for prescribed burning or clear-cutting activities.
- Projects for maintenance activities, deferred or future, without an increase in the level of protection.
- Projects for the purchase of fire-related equipment (e.g., vehicles, fire trucks) or communications equipment, except for warning equipment and systems.
- Creation and maintenance of access roads or staging areas for wildfire response equipment.
- Creation and maintenance of fire breaks.

- Purchase of equipment to accomplish eligible work (e.g., chainsaws, chippers).
- Projects for vegetation irrigation systems installed on the ground and designed to moisten the surface.
- Development or enhancement of fire suppression capability through the purchase of equipment or resources (e.g., water supply or sources, dry hydrants, cisterns not related to water hydration systems, dip ponds).
- Activities intended solely to remedy a code violation without an increase in the level of protection.

B.9.2.4. Duplication of Programs

Before submitting an assistance application, the applicant must ensure that duplication of programs between federal agencies will not occur. FEMA will not provide assistance for activities for which it determines the specific authority lies with another federal agency or program. Wildfire mitigation is addressed by the federal government through a comprehensive legislative framework. FEMA recognizes that other federal departments and agencies, such as the Forest Service, Natural Resource Conservation Service, Fish and Wildlife Service, National Park Service, Bureau of Land Management and the Bureau of Indian Affairs, have primary wildland fire management responsibilities. These departments and agencies also have the primary responsibility for addressing ongoing forest management conditions, such as those caused by forest age, disease and pest infestation spreading to and from the federal lands onto adjacent non-federal lands.

While these and other federal agencies have the specific authority to protect the watersheds, forests, soils and timber resources and address forest management conditions, they also have authority to address wildfire hazard reduction, including hazardous fuels reduction, with primary attention on areas that are on or near federal lands. They may also assist state and local jurisdictions in efforts to protect the built environment in fire-prone areas of forests, ranges and grasslands. FEMA may assist projects that are complementary and adjacent to but not duplicative of projects assisted by other federal agencies.

If projects proposed for FEMA HMA hazardous fuels reduction are in a Wildland Urban Interface area, the applicant can check for potential duplication by contacting a local office of the Department of Agriculture or the Department of the Interior for information. HMA applicants are expected to be aware of any current or proposed hazardous fuels reduction projects under the Department of the Interior or the Department of Agriculture's Forest Service and should provide an assurance to FEMA that there is no duplication of programs. If a project is already under consideration for assistance from another agency, the community should await the outcome of that decision before applying for HMA. If an agreement is already in place with another agency to perform hazardous fuels reduction but there is a delay in funding, HMA cannot be made available to substitute or replace other assistance. If Congress has specifically authorized another federal agency to perform a project,

duplication of programs and HMA cannot be used regardless of whether there is a current appropriation.

FEMA does not have authority to assist projects on federal land owned by another federal entity or projects with the purpose of addressing forest health conditions or ecological or agricultural issues related to land and forest management (e.g., insects, diseases, damage from extreme weather events affecting the forest-wide health, pest infestations). FEMA mitigation authority targets at-risk buildings and structures without regard to the benefits to federal land and activities in areas outside the primary focus of other federal agency wildfire risk reduction programs. FEMA HMA for wildfires is focused on cost-effective, functional mitigation actions taken to reduce the risk to specific properties or buildings and structures from future wildfires or flood after fire. FEMA's goal of reducing the risk from wildfire hazards to human life and property, including loss of function to critical facilities, is intended to complement, and not duplicate, the programs of numerous other federal agencies, such as the Forest Service or Bureau of Land Management, that fund wildfire risk reduction on non-federal lands.

B.9.2.5. Cost-Effectiveness

Applicants and subapplicants must demonstrate that mitigation projects are cost-effective. Projects must be consistent with Part 5 Cost-Effectiveness.

The wildfire module of the FEMA BCA Toolkit considers Landscape Fire and Resource Management Planning Tools (LANDFIRE) data,[472] timber costs, fire suppression costs and project effectiveness.

Project types that may be analyzed using the wildfire module include:

- Defensible space.
- Hazardous fuels reduction activities.
- Ignition-resistant construction.

In some cases, the Historic/Professional Expected Damage methodology may be appropriate if historical damage data is available.

Wildfire mitigation projects may qualify for ecosystem services benefits if they protect an existing natural area. Applying ecosystem services benefits to wildfire mitigation projects should be evaluated on a case-by-case basis, as the design of these projects can vary widely. In general, defensible space and ignition-resistant construction projects are not likely to qualify for ecosystem services benefits. A wildfire mitigation project may not include ecosystem services benefits if:

[472] LANDFIRE data provides information for landscape assessment, analysis and management. The data is from a shared program between the wildland fire management programs of the Forest Service and Department of the Interior.

- It does not protect at least one contiguous acre of natural space, such as a forest or grassland.
- It involves the application of chemicals or other non-natural substances.

B.9.2.5.1. Pre-Calculated Benefits for Post Fire Flood Risk Reduction

FEMA developed pre-calculated benefits for certain mitigation activities that reduce flood risk in wildfire impacted areas. Specifically, benefits of $5,250 per acre are available for the following post-wildfire mitigation project types:

- Soil stabilization.
- Flood diversion (which includes flash flooding prevention and sediment reduction measures).
- Reforestation.

If the cost of a given project does not exceed $5,250 per acre, it will be deemed cost-effective using the pre-calculated benefits methodology. Pre-calculated benefits cannot be combined with benefits from a traditional BCR calculated using the BCA Toolkit.

To use the post-wildfire pre-calculated benefits, the applicant would multiply the number of acres being mitigated by the total benefits per acre of $5,250. For example, if the project is to provide ground cover, soil stabilization and replanting for 1,000 acres and the benefit per acre is $5,250, the total project benefit amount would equal $5,250,000 ($5,250 multiplied by the number of acres—in this case, 1,000).

These pre-calculated benefits are based on the risk reduction and ecosystem service benefits provided by the forest and other vegetation with primary emphasis on the reduced flood risk these systems provide. Post wildfire mitigation projects that demonstrate they are cost-effective (a BCR ratio 1.0 or greater) using the pre-calculated benefits do not need to submit a separate BCA.

For up-to-date information on the dollar value of the pre-calculated benefits, refer to the FEMA "Benefits-Cost Analysis" webpage.

B.9.2.6. Feasibility and Effectiveness

Projects must be consistent with Part 5. Mitigation projects assisted by HMA programs must be both feasible and effective at mitigating the risks of the hazard(s) for which the project was designed. A project's feasibility is demonstrated through conformance with accepted engineering practices, established codes, standards, modeling techniques or best practices.

Wildfire mitigation projects must be technically feasible, effective at reducing risk, and designed and implemented in conformance with all federal, state and local requirements, including state and local building codes and land-use restrictions. FEMA urges the community or any entity implementing

wildfire mitigation to use the materials and technologies that are in accordance with the ICC, FEMA, the Fire Administration and the NFPA Firewise recommendations, whenever applicable.

B.9.2.7. Environmental and Historic Preservation

All subapplications submitted to FEMA must meet the EHP criteria in Part 4. All subapplications must provide the information described in Part 6 so that FEMA may perform the EHP review.

The *Wildfire Technical Review* FEMA EHP job aid lists the documentation needed for projects for FEMA to complete the EHP compliance review process.

B.9.3. WILDFIRE MITIGATION: APPLICATION AND SUBMISSION INFORMATION

All subapplications submitted to FEMA must meet the eligibility criteria in Part 4. All subapplications must have a scoping narrative in accordance with Part 6. Project-specific criteria are highlighted below.

Wildfire mitigation projects can be assisted by HMGP, HMGP Post Fire or BRIC. FEMA may request additional information after the subapplication has been submitted to ensure all necessary information is received. However, all information required by the regulations and the HMA Guide must be received before an assistance decision and award or final approval can be made. The required information includes:

- Documentation that demonstrates that no duplication of programs will occur, that other federal programs have been investigated, and that the applicant has coordinated with other appropriate federal agencies.
- A statement acknowledging that a final operations and maintenance plan will be submitted to FEMA before project closeout.
- A map of the wildfire severity within the project area(s). Wildfire severity, also referred to as wildfire intensity, is influenced by fuels, climate and topography. Identifying the wildfire severity within a project area will demonstrate the potential for dangerous wildfires to occur.
- A map of the wildfire frequency within the project area(s). Wildfire frequency, also referred to as wildfire burn recurrence or wildfire return interval, is determined using historical fire report data. Identifying the wildfire frequency within a project area will demonstrate how often a wildfire is likely to occur.
- A FIRM showing project location and demonstrating the flood zone in which the project is located.

B.9.3.1. Property Location

Provide map(s) showing the project area and the structures' relationship to the Wildland Urban Interface or forested, range or grassland area. The maps should include the following elements:

- **Contour data** on the map or an additional map with the project's boundary and contours.
- **Latitude and longitude** to the nearest sixth decimal place for all corners of the project area so the treatment area's outline can be determined.
- **Ignition-resistant construction**: All structures within the project area(s) should be highlighted on the map.
- **Hazardous fuels reduction and defensible space**: Specific treatment polygons should be identified on the map. Maps should also identify the locations of the structures proposed to be protected by the project and the distance between the project area and the structures.
- **Property address(es) of each structure** involved in the mitigation project. This includes the street name and number; city, county or parish; state; and ZIP code. A post office box number is not an acceptable address. If the address provided does not match with the structure(s) to be mitigated, provide photos or a site map with the structure(s) footprint(s) identified.
- **Structure-specific details**: If the project is protecting multiple structures, this information must be provided, with supporting documentation, for each structure. Provide the following information about the existing structure(s):
    - For hazardous fuels reduction and defensible space projects, a list of the type of structures to be protected (e.g., residential, police station, hospital).
    - Property-level rating of wildfire risk for each home or community and the scale used to measure the rating levels (if applicable).
    - For ignition-resistant construction projects, in addition to the structure type, the following information about each structure:
        - Year the structure was built.
        - Description of the structure type (e.g., elementary school, government building).
        - Description of the construction type (e.g., wood framed, masonry/brick, concrete or steel).
        - Structure information, including the size of the structure and number of stories.
        - The average number of occupants residing in each structure.
        - Description of the foundation.
        - Photographs of the structure to be protected by the wildfire mitigation project. Provide a descriptive caption explaining what each photo shows, the direction it was

taken and the side of the structure shown (e.g., “east side of structure, looking west”).

B.9.3.2. Activities and Schedule

All subapplications must include an activities description referencing industry standards or project plans and specifications and a schedule for completing the activities.

The project narrative must identify the proposed mitigation action and structures to be mitigated, including a description of the proposed activities and a clear explanation of how the project will mitigate risk. The project narrative must include key milestones and correspond with the design information, project schedule and budget.

The following items should be included in the project narrative:

- The wildfire hazard being mitigated, including previous wildfires, damage history and the future potential wildfire risk of the project area(s).
- A rationale for effectiveness. Eligible wildfire mitigation projects must demonstrate mitigation of the risk from wildfire to residential and non-residential buildings and structures, including public and commercial facilities. Projects must be in a Wildland Urban Interface, be adjacent to or intermingled with the built environment, and provide protection to life and the built environment from future wildfires.
- Quantification of the project area where the wildfire mitigation will occur (e.g., 100 acres of fuels reduction) or quantify the area for each type of treatment as it relates to the projected structures (e.g., a 30-foot buffer of defensible space around each identified structure).
- For hazardous fuels reduction projects, a description of the treatment plan or landscaping plan for all vegetation that would be removed or affected by the project for each project site. This should include a description of the types of vegetation that would be removed, the method of removal (e.g., herbicide, hand tools, bulldozer), and the overall goal of the vegetation removal (e.g., decrease vegetation density, remove ladder fuels, create a level and vegetation-free site).
- If vegetation will be planted, details about the types of vegetation and the method of planting.
- A description of the distance from the treatment site to protected structures. A hazardous fuels reduction project could protect numerous structures that are within the treatment area, and the risk reduction for the target community or buildings must be demonstrated in the scoping narrative and supporting documentation.
- For defensible space projects, a description of the proposed defensible space activities for each property. Describe the treatment plan or landscaping plan for all vegetation that would

be removed. In addition, describe any other facilities to be addressed, such as propane tanks, wood decks or fences, and the method of mitigation. Provide the treatment radius around each structure receiving mitigation.

- For fire-resistant materials projects, proposed conceptual designs, project plans and specifications. Fire-resistant materials projects are required to include a defensible space component as part of the application, or each property owner must have previously created defensible space and agrees to maintain it.

- A description of how the project conforms to current codes and best practices. FEMA urges the community or any entity implementing wildfire mitigation to use the materials and technologies that are in accordance with International Wildland Urban Interface Code, FEMA, Fire Administration and the NFPA Firewise recommendations, whenever applicable.

- A description of the equipment that will be used for the project. Include the likely maximum use of this equipment on at least an annual basis. If available, include details about known or planned restrictions to the construction equipment such as seasonal or daily restrictions.

- A description of all potential construction debris, including vegetation, that could be generated by the project. Provide details on the method of disposal of vegetation (such as grazing, chipping or mulching, or hauling to an off-site location) and construction debris, including potential locations and the legal status of disposal sites (whether the site is a licensed landfill).

B.9.3.3. Budget

Subapplications must include detailed line-item costs in the project budgets for each mitigation item provided in the scope of work. Well-documented project budgets contain quantities, unit costs and a source for each unit cost. Lump-sum estimates are not acceptable. The assistance of a licensed engineer, architect or contractor (wildfire expert) may be required to help develop the project cost.

Subapplicants may apply for subrecipient management costs to cover administrative costs. Management costs must be included in the subapplication budget as a separate line item. More information about the requirements for management cost requests can be found in Part 13.

Allowable costs are costs that are necessary and reasonable for the proper and efficient performance and administration of the federal award. They may include but are not limited to:

- Engineering services for design, structural feasibility analysis, geotechnical assessments and budget preparation.

- Project administration and construction management.

- Soil sampling.

- Permit costs.
- Surveying and inspection.
- Labor costs.
- Management costs (refer to Part 13).
- All construction activities.
- List of equipment, including cost for each item.
- Debris removal and disposal costs (e.g., hauling, chipping).
- Erosion control.
- List of construction materials, including unit cost for each item.

A cost per structure must be provided for defensible space and ignition-resistant construction projects, and a cost per acre must be provided for hazardous fuels reduction projects.

Maintenance costs should reflect the costs associated with mitigation being maintained for the entire project useful life. Maintenance costs will vary, depending on project type, geographic location, climate and vegetation type. For example:

- **Defensible space**: Grassland vegetation was mowed and forested vegetation was removed within a 100-foot radius of the structure. At a minimum, to maintain the project effectiveness, the grassland regrowth must be mowed on a consistent basis (dependent on geographic location and precipitation) throughout the one-year project useful life. The forested regrowth must be hand trimmed at least every three years throughout the 20-year project useful life.
- **Hazardous fuels reduction**: 150 acres of dense forested vegetation was thinned out by pruning the forested canopy. To maintain effectiveness, the forested regrowth must be hand trimmed at least every three years throughout the 20-year project useful life.
- **Ignition-resistant construction**: Brush was removed within a 100-foot radius of the structure to create the required defensible space, and a fire-resistant roof was put on the structure. At a minimum, to maintain the project effectiveness, the brush regrowth must be trimmed on a consistent basis (dependent on drought conditions) throughout the four-year project useful life. Minimal roof maintenance should be required within the 10-year project useful life.
- **Flash flooding prevention measures**: Contour log felling was completed for a width of about 500 feet perpendicular to a slope denuded by wildfire. The logs were staked in place to prevent them from rolling downhill. Soil was tamped between the logs and the ground surface to prevent water from eroding under the logs. A trench approximately 1-foot deep

was dug on the uphill side of each log to catch debris. To maintain project effectiveness, the debris trenches must be cleared annually until vegetation on the slope is re-established (about three years).

B.9.4. WILDFIRE MITIGATION: SUBAWARD IMPLEMENTATION

The basic steps in implementing an approved HMA wildfire project are:

1. Pre-construction (carry out design process; site assessments, seek technical consultant; prepare cost estimate; obtain construction permits, including requirement environmental permits; hire construction manager/contractor).
2. Coordinate with appropriate state, local tribal and territorial agencies and private nonprofits as appropriate.
3. Clear/prepare site for construction activities.
4. Construct/implement/install mitigation measures included in the project.
5. Achieve substantial completion.
6. Complete inspections and obtain certificate of occupancy (if required).
7. Complete monitoring and maintenance.

Post-award monitoring helps ensure subapplicants/subrecipients are achieving the objectives of the federal award consistent with the performance goals and milestones described in the subaward. To assist the recipient in monitoring wildfire projects, the following milestone information or events should be included in Quarterly Progress Reports:

- If the subrecipient is acquiring contract support, the subrecipient should report when the request for proposal is completed, when the contract is out for bid, when the bid period closes, when proposals are reviewed, when the contractor is selected and the date of the kick-off meeting.
- Describe the current status including a summary of:
    - Recent progress and planned work.
    - Risks identified or changes from the milestones/deliverables submitted with the scope of work (e.g., financial concerns, coordination issues with state or local governments and utilities, project management or contracting issues, legal disputes, and significant changes impacting construction activities or timelines such as delays due to weather, materials, procurement or labor issues).
- When construction has started, is substantially complete or completed.
- Any other milestones that have been identified in the subapplication or agreed to or are required by the recipient.

B.9.4.1. Budget and Scope of Work Change

Recipients are required to report deviations from budget, project scope or objectives in accordance with Part 8. Recipients must request prior approvals from FEMA for budget and program plan revisions.[473] If the final design is not complete prior to award, once the project is awarded, the design must be finalized by a licensed design professional. Any changes to the scope of work or budget because of completing the final design or to address permitting requirements must be consistent with Part 8. Construction design activities are defined as construction activities; therefore, budget changes involving them must be consistent with Part 8.F.2.

B.9.5. WILDFIRE MITIGATION: CLOSEOUT

Recipients and subrecipients must closeout projects in a timely manner consistent with Part 9.

In addition to the typical HMA program closeout procedures, closeout of wildfire projects generally includes:

- Property site inventory listing of all properties mitigated.
- Final inspection report with the name of the inspector and date of inspection. The report must include the following:
  - A narrative of all the components of the project that were completed and verification that the scope of work was completed and is consistent with activities identified in the scope of work.
  - Photographs of the project area(s) with clear labels.
  - A map of the project area(s) with accurate latitude/longitude to the nearest sixth decimal place.
- Clearly labeled photographs of the project site before and after mitigation. Photos should confirm the scope of work is completed.

In addition, the closeout of wildfire mitigation projects includes submitting an operations and maintenance plan to FEMA for review prior to project closeout. In the operations and maintenance plan, the recipient must confirm the plan is consistent with the HMA Guide, meets or exceeds local codes, and is in conformance with appropriate fire-related codes.

At a minimum, the operations and maintenance plan must include all the following information:

- Information demonstrating the completed wildfire project will be maintained to achieve the proposed hazard mitigation.

[473] 2 CFR § 200.308

- A description of the post-closeout maintenance activities that will be undertaken to maintain the project area(s) or site(s).
- The period of time the community is committing to maintain the area and/or project site, which must be consistent with the project useful life in the BCA.
- The department and job position that will be responsible for maintaining the project after the construction has ended.
- Estimated costs for annual maintenance of the project.
- The schedule for implementation of the maintenance activities.

B.9.6. WILDFIRE MITIGATION: RESOURCES

Wildfire Mitigation Resources

- FEMA BCA webpage: https://www.fema.gov/grants/guidance-tools/benefit-cost-analysis
- FEMA EHP review job aids: https://www.fema.gov/grants/guidance-tools/environmental-historic/preparation-resources
- National Fire Protection Association Firewise: https://www.nfpa.org/Public-Education/Fire-causes-and-risks/Wildfire/Firewise-USA
- International Code Council: https://www.iccsafe.org/products-and-services/i-codes/2018-i-codes/irc/
- 2021 International Wildland-Urban Interface Code: https://codes.iccsafe.org/content/IWUIC2021P1
- Fire Administration: https://www.usfa.fema.gov/
- National Fire Protection Association: https://www.nfpa.org/Codes-and-Standards/All-Codes-and-Standards
- FEMA HMA job aids: https://www.fema.gov/grants/mitigation/job-aids
- FEMA HMGP Post Fire: https://www.fema.gov/grants/mitigation/post-fire
- FEMA P-737, *Homebuilders Guide to Construction in Wildfire Zones*: https://www.fema.gov/sites/default/files/documents/fema_p-737-vents-technical-fact-sheet-8.pdf
- FEMA P-754, *Wildfire Hazard Mitigation Handbook for Public Facilities*: https://www.fema.gov/sites/default/files/2020-08/fema_p_754.pdf
- International Wildland Urban Interface Code 2018 (or most recent version): https://codes.iccsafe.org/content/IWUIC2018/effective-use-of-the-international-wildland-urban-interface-code

- LANDFIRE Program: https://www.landfire.gov/
- National Fire Protection Association 703, *Standard for Fire-Retardant Treated Wood and Fire-Retardant Coatings for Building Materials*: https://www.nfpa.org/codes-and-standards/all-codes-and-standards/list-of-codes-and-standards/detail?code=703
- National Fire Protection Association 914, *Code for Fire Protection of Historic Structures*: https://www.nfpa.org/codes-and-standards/all-codes-and-standards/list-of-codes-and-standards/detail?code=914
- National Fire Protection Association 1141, *Standard for Fire Protection Infrastructure and Land Development in Suburban Rural Areas*: https://www.nfpa.org/codes-and-standards/all-codes-and-standards/list-of-codes-and-standards/detail?code=1141
- National Fire Protection Association 1144, *Standard for Reducing Structure Ignition Hazards from Wildland Fire*: https://www.nfpa.org/codes-and-standards/all-codes-and-standards/list-of-codes-and-standards/detail?code=1144

B.10. Retrofit

B.10.1. RETROFIT: OVERVIEW

Retrofitting is any change made to an existing structure to reduce or eliminate the possibility of damage to that structure from flooding, tsunami, erosion, extreme temperatures, high winds, earthquakes, wildfires, snow or other hazards. Retrofits may be structural or non-structural in nature and may incorporate climate-smart building materials that reduce or help withstand extreme temperatures.

B.10.1.1. Structural Retrofit

Structural retrofitting is used to address structural deficiencies in existing buildings and structures. Since building codes generally are not retroactive, existing buildings and structures only comply with codes in effect at the time of their design and construction. Therefore, existing buildings and structures may not meet the current standards and codes for new construction. In some circumstances, when a building undergoes alteration, repair, addition or change of occupancy, current building codes can be triggered for structural updates to meet the code requirements and desired building performance. Outside of these circumstances, local authorities may require mandatory retrofitting for certain vulnerabilities in existing buildings and structures. The International Existing Building Code and reference standards are commonly used for structural retrofitting to achieve a certain level of risk reduction.

B.10.1.2. Non-Structural Retrofit

Non-structural retrofitting involves the modification of a building or facility's non-structural elements. These are actions such as bracing building contents to prevent earthquake damage, elevating heating and ventilation systems to minimize or prevent flood damage. Non-structural retrofits may be done in conjunction with or independently from structural retrofits.

B.10.1.3. Seismic Structural Retrofit

The goal of a seismic structural retrofitting project is to reduce the risk of death, serious injury and property damage during an earthquake event. This is typically accomplished by modifying and strengthening a building's seismic load-resisting system to reduce or eliminate known seismic deficiencies. Some vulnerable building types in high seismic regions are likely candidates for seismic structural retrofitting projects, including unreinforced masonry, non-ductile concrete, weak/soft first stories and tilt-up buildings. Local authorities may issue a seismic ordinance requiring the evaluation and retrofit of certain vulnerable building types. An evaluation completed in accordance with the latest published edition of ASCE/SEI 41, *Seismic Rehabilitation of Existing Buildings*, is often necessary to identify the deficiencies that may require seismic structural retrofitting. Sometimes new structural elements are added. In many cases, existing elements can be enhanced to meet an improved level of performance. For some critical or essential buildings in high seismic regions such

as school buildings or hospitals, new construction in compliance with the most current building codes often achieve a desired better performance.

The following are common examples of seismic structural retrofitting project elements:

- Adding new lateral load-resisting elements including concrete or steel shear walls or structural steel-braced or moment frames.
- Adding reinforcement, shotcrete overlay, confinement or post tensioning to unreinforced masonry walls.
- Adding new vertical load resisting elements to prevent floor or roof collapse.
- Providing continuous load paths for lateral load-resisting systems.
- Eliminating weak or soft stories by infilling openings or adding moment frames.
- Increasing concrete member ductility with column jackets or steel or fiber wraps.
- Modifying existing steel-braced frames with buckling restrained/resistant braces or other.
- Installing base isolation systems or adding damping elements.
- Adding pneumatically applied concrete, weld plates or plywood panels to existing lateral load-resisting systems.
- Strengthening roof and floor diaphragms and their connections to supporting walls and lateral load-resisting systems.
- Eliminating plan irregularities by modifying floor areas or adding seismic joints.
- Enhancing detailing of structural elements to improve ductility such as pre-1994 special steel moment frame joint detailing.

More information on seismic vulnerabilities of different building types and specific retrofitting techniques, refer to FEMA P-547, *Techniques for the Seismic Rehabilitation of Existing Buildings* (Feb. 2007).

B.10.1.4. Seismic Non-Structural Retrofit

The goal of seismic non-structural retrofitting is to reduce the risk of death, serious injury and damage during a future earthquake event. This is typically accomplished by securing, bracing or isolating architectural elements; mechanical, electrical and plumbing equipment; and building contents. Building codes have specific requirements for anchoring major architectural and mechanical, electrical, and plumbing components. Before undertaking a seismic non-structural retrofitting project, subapplicants should first ensure the structural load bearing and hazard load-

resisting systems to support their non-structural components or systems are adequate, especially some seismically vulnerable structures such as unreinforced masonry or nonductile concrete frame buildings that may need to be retrofitted. Non-structural retrofitting typically has higher BCR than structural retrofitting; however, it makes little sense to strap down computer monitors if the building collapses in an earthquake.

Examples of seismic non-structural retrofitting include providing secure attachments for the following:

- Exterior facade panels or brick masonry.
- Architectural ornaments, roof parapets and chimneys.
- Heavy interior partition walls.
- Utility and mechanical equipment/systems such as heating, ventilation, air conditioning, water/sewer, gas, electric, ductwork, pipes, motors, pumps and fans.
- Communication equipment and distribution.
- Drop ceilings and pendant lighting.
- Lens covers on fluorescent light fixtures.
- Mirrors, paintings, clocks and similar heavy/fragile wall-mounted objects.
- Computers and monitors.
- Filing cabinets, bookcases and lockers.

Other examples of non-structural retrofitting seismic mitigation include:

- Removing heavy ornaments or other features determined not to be needed.
- Replacing or jacketing hollow clay-tile walls, especially in stairways and exit corridors.
- Arranging building contents to reduce risk of falling hazards.
- Storing fragile items and equipment on or near floors.
- Securing all dangerous chemicals to prevent container breakage.

B.10.1.5. Wind Retrofit

Wind retrofit projects will help reduce or eliminate building and content damage from wind and wind-driven rain. Wind retrofits may also provide better protection for occupants; however, buildings with

wind retrofits do not provide near-absolute protection from wind and windborne debris for occupants as a safe room would.

Retrofitting one element of a building without accounting for wind vulnerabilities in the non-retrofitted elements can lead to ineffective mitigation. Simply protecting one element does not necessarily achieve the goal of protecting the building and its contents during a high-wind event, nor does it ensure the building will be functional. Even when a retrofitted element performs as intended, the building as a whole may not achieve the target performance level intended by the retrofit. To achieve the intended performance level, all building elements that may be vulnerable to wind damage should be identified, and a comprehensive plan for executing the needed retrofits should be developed.

Wind retrofits involve strengthening connections to ensure a continuous load path from the roof to the foundation; protecting openings with impact-resistant glazing, shutters or doors rated for higher winds; and proper anchoring of components, cladding and rooftop equipment. As a best practice, all installed shutters, windows and door assemblies should have labels showing their wind pressure and/or windborne debris resistance. Such labels ensure the assemblies have been tested and are suitable for their intended purpose. Wind retrofit projects for one- and two-family residential buildings must be designed in conformance with the design criteria found in FEMA P-804, *Wind Retrofit Guide for Residential Buildings*.

Examples of wind retrofit projects include:

- Replacing roof and wall coverings with those capable of resisting high winds.
- Installing and improving roof covering underlayments such as securing roof deck attachments and providing a secondary water barrier.
- Protecting openings (windows, doors, garage doors, soffits and vents) to resist high winds, windborne debris and wind-driven rain.
- Strengthening vents and soffits.
- Connecting structural systems to provide a continuous path for all loads (gravity, uplift and lateral) to be passed from the building exterior surfaces to the ground through the foundation.
- Strengthening overhangs.
- Bracing gable end walls.
- Lateral force resisting system.
- Anchoring rooftop equipment.
- Strengthening connections to attached structures.

Hurricane-prone regions, as defined by the most current publication of ASCE/SEI 7, *Minimum Design Loads for Buildings and Other Structures*, may have additional requirements for protecting buildings from wind and wind-borne debris. More information can be found in FEMA P-804 and FEMA Hurricane Michael Recovery Advisory 1, *Successfully Retrofitting Buildings for Wind Resistance* (June 2019).

B.10.1.6. Wildfire Retrofit

Retrofitting for wildfire involves structurally protecting buildings using non-combustible materials and technologies. Wildfire retrofits are more effective in conjunction with other wildfire mitigation measures.

Wildfire retrofitting also includes replacing water systems that have been burned and have caused contamination. Wildfires generate intense heat that can adversely impact water system components both on the surface and underground. If intense heat modifies the chemical properties of water system components, chemicals might leach into the water, causing contamination. Infrastructure retrofits that reduce future risk to existing utility systems, including water systems, are eligible under HMA programs. The mitigation measures that are applied to the utility system can address more than just the hazard that caused the damage. In addition to replacing water systems that have been burned, HMA can be used to mitigate:

- System components that have not been damaged but are like other systems that have sustained damage.
- Undamaged portions of systems that have been partially damaged.

B.10.1.7. Snow Retrofit

Buildings and infrastructure can be protected from the impacts of winter storms with the following techniques:

- Adding building insulation to attic floors and ensuring adequate ventilation of the attic area can prevent roof snow melt that can cause ice dams to form and greater chances of water infiltration.
- Retrofitting buildings to withstand snow loads and prevent roof collapse. Refer to FEMA Design Guide, *Three-Dimensional Roof Snowdrifts* (Aug. 2019) for guidance on determining roof drift loads.

B.10.2. RETROFIT: ELIGIBILITY

This section addresses project eligibility requirements and lists the types of projects that FEMA will assist.

B.10.2.1. Eligibility Criteria

All other retrofit subapplications submitted to FEMA must meet the eligibility criteria in Part 4.

B.10.2.2. Eligible Activities

Table 34 highlights eligible retrofit activities.

Table 34: Eligible Retrofit Activities

Eligible Activities	HMGP	HMGP Post Fire	BRIC	FMA
Structural (non-seismic)	Yes	Yes	Yes	Yes
Non-Structural (non-seismic)	Yes	Yes	Yes	Yes
Seismic Structural	Yes	Yes	Yes	No
Seismic Non-Structural	Yes	Yes	Yes	No
Wind	Yes	Yes	Yes	No
Wildfire	Yes	Yes	Yes	No
Snow	Yes	Yes	Yes	No

B.10.2.3. Ineligible Activities

A general list of ineligible activities is included in Part 4.

B.10.2.4. Cost-Effectiveness

Applicants and subapplicants must demonstrate that mitigation projects are cost-effective. Projects must be consistent with Part 5.

Pre-calculated benefits are available for hurricane wind retrofit measures.

B.10.2.4.1. Pre-Calculated Benefits for Hurricane Wind Retrofit Measures: One- and Two-Family Residences

Hurricane wind retrofit projects are eligible for assistance under the HMGP, HMGP Post Fire and BRIC programs. FEMA has determined that applicants and subapplicants may use pre-calculated benefits to demonstrate the cost-effectiveness of wind retrofit projects that comply with FEMA P-804. Using pre-calculated benefits eliminates the requirement for applicants or subapplicants to conduct a separate BCA for a hurricane wind retrofit project that meets the criteria identified in

Table 35. The benefits are based on FEMA's existing methodology for evaluating the cost-effectiveness of residential wind retrofit projects and use updated 2014 construction costs for the measures outlined in FEMA P-804.

Pre-Calculated Benefits for Wind Retrofits

Pre-calculated benefits can be used for hurricane wind retrofit projects under the HMGP, HMGP Post Fire and BRIC programs. These pre-calculated benefits will streamline the cost-effectiveness determination for residential wind retrofit projects.

For one- and two-family residences, a wind retrofit project is considered cost-effective if the total project costs are less than the costs listed in

Table 35. For up-to-date information on the dollar value of pre-calculated benefits, visit the FEMA "Benefit-Cost Analysis" webpage.

Table 35: Pre-Calculated Benefit Amounts for Wind Retrofit Projects

Mitigation Package Type	Roof Replacement Project	Maximum Costs
Intermediate protection	No	$13,153
	Yes	$24,920
Advanced protection	No	$40,252
	Yes	$52,018

To use these benefit amounts, the applicant must meet the following requirements:

- Wind retrofit projects must be for residential buildings, excluding manufactured homes, and must comply with FEMA P-804.
- Residential structures must be located in an area where wind speeds are greater than or equal to 120 mph for Occupancy Category II Buildings in accordance with the latest published edition of ASCE/SEI 7.
- Applications must include maps that clearly indicate the structures to be retrofitted as being in an area where wind speeds are greater than or equal to 120 mph to be eligible to use the pre-calculated benefits.
    - Areas eligible to use the pre-calculated benefits are identified on the list of states and territories and their associated counties, parishes and boroughs.
        - States, boroughs, counties, parishes and territories that meet the qualification requirements for pre-calculated benefits: This includes areas completely located within the 120-mph wind zone. These areas are automatically eligible to use the pre-calculated benefit-costs if the application includes a map with the structures clearly indicated on it.

- States, boroughs, counties, parishes and territories that are partially located in the 120-mph wind zone: For structures located in these areas FEMA will need to make the determination on a case-by-case basis if the pre-calculated benefits can be used. Applicants and subapplicants will need to submit a map with the structures clearly indicated on it to FEMA, who will then determine if the structure is located in the wind zone and can use the pre-calculated benefits.

Budgets submitted for a hurricane wind retrofit project using the pre-calculated benefits must be developed using industry-accepted cost-estimation standards, vendor estimates or other sources. The costs identified cannot be used to estimate or develop application project costs. Only documented, eligible costs for completed work will be reimbursed. The benefits in

Table 35 above may be adjusted by the applicant or subapplicant using the most current locality multipliers included in industry-accepted cost and pricing guides for construction.

If a multiplier is used, a copy of the source document must be included as part of the application for review and the methodology used to determine the increase must be demonstrated.

The pre-calculated benefits for wind retrofit projects cannot be combined with other benefits, such as those from the cost-effectiveness determination for acquisition and elevations or from the BCA Toolkit.

For up-to-date information on the dollar value of the pre-calculated benefit, refer to the FEMA "Benefit-Cost Analysis" webpage.

B.10.2.4.2. Pre-Calculated Benefits for Hurricane Wind Retrofit Measures – Non-Residential Structures

Non-residential buildings in windborne debris regions have two options of mitigation packages eligible for the pre-calculated benefits:

- **Option 1**: Opening protection for doors, windows and louvers against wind-borne debris, wind-driven rain and high wind pressure; and roof retrofit, which consists of securing rooftop equipment, replacing roof decking and covering.

- **Option 2:** Opening protection, roof retrofit and improvement to or creating a continuous load path from the roof to the foundation.

Eligible structures must have primary structural framing that consists of steel, concrete or reinforced masonry. Structures composed of other building materials, such as wood, steel stud and unreinforced masonry, are not eligible for this pre-calculated benefit. When retrofitted, structures will comply with the loading requirements of the latest edition of the IBC, International Existing Building Code, the latest published edition of ASCE/SEI 7, FEMA 577: *Design Guide for Improving Hospital Safety in Earthquakes, Floods, and High Winds* (June 2007), and the requirements of the locally

enforced building code. In the event of conflicting requirements, the most stringent one must be used.

Applicants must provide maps with structures clearly indicated as being in a windborne debris region to be eligible to use the pre-calculated benefits.[474] Additionally, the project must have a useful life of at least 25 years.

Mitigation projects meeting the above criteria are considered cost-effective if the mitigation projects cost less than 10% of the replacement cost value. This eliminates the requirement for applicants to conduct a separate BCA for eligible projects. The benefits are based on FEMA's existing methodology for evaluating the cost-effectiveness of non-residential wind retrofit projects.

Applicants must document the source used to determine the replacement cost value. Additionally, budgets submitted with projects for hurricane wind retrofits that use the pre-calculated benefits must be developed using industry cost-estimation standards, vendor estimates or other industry acceptable sources. The benefits identified here cannot be used to estimate or develop application project costs. Projects must still meet all other HMA program requirements.

B.10.2.4.2.1. PUERTO RICO AND THE U.S. VIRGIN ISLANDS

Non-residential wind retrofit projects in Puerto Rico and the U.S. Virgin Islands may use the pre-calculated benefit if the total mitigation project cost is less than 25% of the replacement cost value.

B.10.2.5. Feasibility and Effectiveness

Projects must be consistent with Part 4. Mitigation projects assisted by HMA must be both feasible and effective at mitigating the risks of the hazard(s) for which the project was designed. A project's feasibility is demonstrated through conformance with accepted engineering practices, established codes, standards, modeling techniques or best practices.

B.10.2.5.1. Codes and Standards

FEMA P-804 provides design guidance for wind-retrofit projects on existing one- and two-family dwellings in coastal areas. Mitigation projects assisted under HMGP, HMGP Post Fire and BRIC are required to be implemented in conformance with FEMA P-804. If a subapplication complies with FEMA P-804, no additional technical information is required in the subapplication.

[474] Windborne debris regions can be identified using the Applied Technology Council "Hazards by Location" website or other authoritative sources. More information can be found in FEMA P-804.

In addition, all HMA-assisted retrofit projects representing Substantial Improvement in flood hazard areas must also comply with the requirements established by the Federal Flood Risk Management Standard.[475] Refer to Part 4.I for more information about these requirements.

B.10.2.6. Environmental and Historic Preservation

All subapplications submitted to FEMA must meet the eligibility criteria in Part 4. All subapplications must have a scoping narrative in accordance with Part 6.

The *Hurricane Wind Retrofit Technical Review* and *Seismic Retrofit Technical Review* FEMA job aids list the documentation needed for FEMA to complete the EHP compliance review process for projects.

B.10.2.6.1. Americans with Disabilities Act

The ADA and Architectural Barriers Act of 1968 require that all facilities be accessible to and usable by individuals with disabilities.[476]

B.10.2.7. National Flood Insurance Program Eligibility Requirements

Mitigation projects sited within the SFHA are eligible only if the jurisdiction is participating in the NFIP. For FMA only, all properties included in a subapplication must be NFIP insured at the time of the opening of the application period. The flood insurance policy must be maintained throughout the period of performance and for the life of the structure. For more information, refer to Part 4.J.

B.10.2.8. Special Flood Hazard Area Requirements

For structures in the SFHA at the completion of the project and all structures receiving FMA regardless of location in the SFHA, flood insurance must be maintained for the life of the property.[477] For more information, refer to Part 4.J.

[475] Under 44 CFR § 9.4, Substantial Improvement means any repair, reconstruction or other improvement of a structure or facility that has been damaged in excess of, or the cost of which equals or exceeds, 50% of the market value of the structure or replacement cost of the facility (a) before the repair or improvement is started, or (b) if the structure or facility has been damaged and is proposed to be restored, before the damage occurred. All "public facilities" as defined in the Disaster Relief Act of 1974 are included. If a facility is an essential link in a larger system, the percentage of damage will be based on the relative cost of repairing the damaged facility to the replacement cost of the portion of the system that is operationally dependent on the facility. The term Substantial Improvement does not include any alteration of a structure or facility listed on the National Register of Historic Places or a State Inventory of Historic Places.

[476] Public Law 101-336 (July 26, 1990), as amended, 42 U.S.C. § 12101; Public Law 90-480 (Aug. 12, 1968), 42 U.S.C. § 4151;

[477] 42 U.S.C. § 4012a(a)

B.10.3. RETROFIT: APPLICATION AND SUBMISSION INFORMATION

All subapplications submitted to FEMA must meet the eligibility criteria in Part 4. All subapplications must have a scoping narrative in accordance with Part 6. Project-specific criteria are highlighted below.

FEMA may request additional information after the subapplication has been submitted to ensure all necessary information is received. However, all information required by the regulations and the HMA Guide must be received before an assistance decision and award or final approval can be made.

B.10.3.1. Property Location

All subapplications must include latitude/longitude to the nearest sixth decimal place, site photographs, site maps, and project plans and specifications.

B.10.3.2. Scope of Work

The scope of work must contain sufficient detail to evaluate effectiveness in reducing the identified natural hazard(s). It must also be detailed enough to develop a reasonably accurate budget. Technical documentation (including sketches and engineering calculations) should be provided with the subapplication to demonstrate that the proposed work will successfully mitigate against future natural hazard damage.

The scope of work should include the following as well as applicable references and supporting documentation:

- Description of any work required to be compliant with any federal, state and local laws, regulations and ordinances, such as historic preservation issues or accessibility requirements.
- References to all design provisions consulted including federal, state and local building codes and standards.
- Level of protection provided by the proposed project.
- Any residual risk to the structure from all hazards after project implementation.
- Proposed project details:
    - Description of the proposed activity to correct the identified non-structural deficiencies including a discussion of any alternative schemes considered.
    - Description of design criteria.
    - Description of any work required to be compliant with any federal, state and local laws, regulations and ordinances, such as historic preservation issues or accessibility requirements.

B.10.3.2.1. Structural Seismic Retrofit

At a minimum, the following items must be included:

- Geotechnical conditions (e.g., site classification according to ASCE 7 and identification of known geologic/seismic hazards [fault rupture, liquefaction, landsliding, etc.]). Site class D may be assumed if information is not available.
- Site-specific ground acceleration data.
- Description of any damage sustained in past earthquakes.
- Descriptions of all identified seismic deficiencies including overstressed structural elements, soft or weak stories, plan or vertical irregularities, excessive deflections, non-continuous load paths and areas of low ductility.
- Description of non-structural elements that could interact with the structural elements during an earthquake.
- Description of the intended Seismic Force-Resisting System in conformance with ASCE 7 Table 12.2-1 or a combination of systems as permitted in Sections 12.2.2, 12.2.3, and 12.2.4 of ASCE 7.

The current engineering practice is to design for a maximum considered earthquake used for collapse prevention. Except in near-fault areas, it is equivalent to the earthquake having a 2% chance of exceedance or 1% probability of collapse in 50 years. For new construction, it is generally multiplied by a factor of two-thirds to produce life safety-level design. Site-specific seismic hazard data is required for both evaluation and design. This data consists of the MCER spectral response accelerations for periods of SS and S1. Values for these parameters can be obtained from the U.S. Geological Survey website[478] as well as ASCE/SEI 7. This data is also available in the most recent edition of the IBC and may be available in the subapplicant's local building code. Alternatively, the seismic response parameters/acceleration or performance parameters from ASCE 41 can be used.

B.10.3.2.2. Non-Structural Seismic Retrofit

At a minimum, the following items must be included:

- Site-specific seismic hazard data for the MCE_R spectral response accelerations for periods of S_S and/or S_1. Refer to ASCE/SEI 7 for more information on seismic design criteria.
- Description of any damage sustained in past earthquakes.
- Descriptions of all identified non-structural seismic deficiencies.

[478] https://www.usgs.gov/natural-hazards/earthquake-hazards/maps

The current engineering practice is to design for an MCE_R used for collapse prevention. Except in near-fault areas, it is equivalent to the earthquake having a uniform risk of 1% chance of causing building collapse in 50 years. For new construction, it is generally multiplied by a factor of two-thirds to produce life safety level design. Site-specific seismic hazard data is required for both evaluation and design. This data consists of the MCE_R spectral response accelerations for periods of S_S and S_1. Values for these parameters can be obtained from the U.S. Geological Survey website as well as ASCE/SEI 7 or FEMA P-1050, *National Earthquake Hazards Reduction Program Recommended Seismic Provisions for New Buildings and Other Structures* (2015). This data is also available in the 2018 IBC and may be available in the subapplicant's local building code.

B.10.3.2.3. Property Description Structural Seismic Retrofit

The following information regarding the building should be included in the property description of the application:

- Age of structure entered as year built.
- Date of any upgrades or additions.
- Building type.[479]
- Site classification.[480]
- Risk category.[481]
- Foundation type.
- Number of floors, including basement and dimensions including inter-story heights.
- Floor and roof diaphragm construction (to evaluate flexibility).
- Location of any seismic isolation joints.
- Description of architectural finishes (floors, walls and ceilings) and glazing.

B.10.3.2.4. Property Description Non-Structural Seismic Retrofit

The following information regarding the building should be included in the property description of the application:

- Age of structure entered as year built.

[479] ASCE/SEI 41
[480] ASCE/SEI 7
[481] ASCE/SEI 7

- Date of any upgrades or additions.
- Building type.[482]
- Site classification.[483]
- Risk category.[484]
- Foundation type.
- Number of floors, including basement and dimensions including inter-story heights.
- Floor and roof diaphragm construction (to evaluate flexibility).
- Location of any seismic isolation joints.
- Description of architectural finishes (floors, walls and ceilings) and glazing.

B.10.3.3. Activities Description and Schedule

As part of the scope of work, all subapplications must include an activities description mitigation activity. The scope of work must include all activities necessary for completing the project and should reference industry standards or project plans and specifications.

The subapplication must contain a schedule for accomplishing the proposed work. The following project elements should be included in the work schedule:

- Architectural/engineering design including schematic, design development and contract document phases.
- Materials testing or other anticipated studies.
- Advertising, bid and award of contract(s).
- Permitting.
- Temporary relocation of occupants and contents, if needed.
- Contractor mobilization.
- Construction, including milestones such as inspections certifying occupancy.

[482] ASCE/SEI 41, Seismic Evaluation and Retrofit of Existing Buildings, Table 3-1
[483] ASCE/SEI 7, Chapter 20
[484] ASCE/SEI 7, Table 1.5-1

- Reoccupation of facility.
- Closeout.

B.10.3.4. Budget

All subapplications must include a line-item breakdown of all anticipated costs. Refer to Part 6 for more information.

The budget describes all anticipated and potential costs associated with the proposed project activity and represents the subapplicant's best estimate of the proposed activity's total value. Sufficient detail should be provided regarding various cost items. Backup documentation for all costs, including the basis for each, should be provided (e.g., bids from qualified professionals, nationally published or local cost estimating guides). Also, the budget should reference the base year for all cost data used. Costs should be provided for the following tasks:

- Architectural/engineering design.
- Materials testing or other anticipated studies.
- Permits.
- Installation of retrofitting measures.
- Any additional work required including the demolition/restoration of architectural finishes as well as work to the building's utility systems.
- Temporary relocation including rental and moving expenses (out and back).
- Compliance with federal, state and local laws, regulations and ordinances, such as historic preservation issues or required accessibility upgrades.

Subapplicants may apply for subrecipient management costs to cover administrative costs. Management costs must be included in the subapplication budget as a separate line item. More information about the requirements for management cost requests can be found in Part 13.

B.10.4. RETROFIT: SUBAWARD IMPLEMENTATION

The following are basic steps in implementing an approved HMA retrofit project:

1. Pre-construction (acquire land and/or easements, if applicable; carry out design process; seek technical consultant; prepare cost estimate; obtain construction permits, including required environmental permits; hire construction manager/contractor).
2. Coordinate any needed closures or outages.

3. Clear site/site preparation; install erosion control measures to prepare for construction activities.

4. Construct in accordance with approved project plans and specifications.

5. Conduct inspections and obtain certifications.

6. Prepare the operations and maintenance plan.

Post-award monitoring helps ensure subrecipients are achieving the objectives of the federal award consistent with the performance goals and milestones described in the subaward. To assist the recipient in monitoring retrofit projects, the following information should be included in Quarterly Progress Reports:

- If the subrecipient is acquiring contract support, the subrecipient should report when the request for proposal is completed, when the contract is out for bid, when the bid period closes, when proposals are reviewed, when the contractor is selected and the date of the kickoff meeting.

- Describe the current status including a summary of:

  - Recent progress and planned work.

  - Risks identified or changes from the milestones/deliverables submitted with the scope of work (e.g., financial concerns, coordination issues with state or local governments and utilities, project management or contracting issues, legal disputes, and significant changes impacting construction activities or timelines such as delays due to weather, materials, procurement or labor issues).

- When construction has started, is substantially complete or completed.

- Any other milestones that have been identified in the subapplication, agreed to, or are required by the recipient.

B.10.4.1. Budget and Scope of Work Change

Recipients are required to report deviations from budget, project scope or objectives in accordance with Part 8. Recipients must request prior approvals from FEMA for budget and program plan revisions.[485] If the final design is not complete prior to award, once the project is awarded, the design must be finalized by a licensed design professional. Any changes to the scope of work or budget because of completing the final design or to address permitting requirements must be

[485] 2 CFR § 200.308

consistent with Part 8. Construction design activities are defined as construction activities; therefore, budget changes involving them must be consistent with Part 8.F.2.

B.10.5. RETROFIT: CLOSEOUT

Recipients and subrecipients must closeout projects in a timely manner consistent with Part 9.

In addition to the typical HMA program closeout procedures, closeout of retrofit projects generally includes:

- Verification that completed projects provide the level of protection approved in the scope of work.
- Certification from a licensed professional engineer or architect that all retrofits meet the required code and standards for the project type. For residential wind retrofit projects, proof the project has been designed and implemented in accordance FEMA P-804.
- Photos of the project site before and after construction. Photos should confirm the scope of work is completed.
- Latitude/longitude of the project site to the nearest sixth decimal place.
- A vicinity map and map of the SFHA if applicable.
- For properties located within the SFHA:
  - If applicable, a copy of the *Elevation Certificate* (FEMA Form 086-0-33).
  - Recorded deed for each mitigated property, indicating compliance with the *Acknowledgement of Conditions for Properties Using FEMA Hazard Mitigation Assistance*.
  - Proof of appropriate level of flood insurance (such as a copy of the flood insurance policy).

B.10.6. RETROFIT: RESOURCES

Retrofit Resources

- FEMA Building Science: https://www.fema.gov/emergency-managers/risk-management/building-science
- FEMA BCA: https://www.fema.gov/grants/guidance-tools/benefit-cost-analysis
- FEMA EHP review job aids: https://www.fema.gov/grants/guidance-tools/environmental-historic/preparation-resources

- *Infrastructure Retrofit Technical Review* FEMA job aid: https://www.fema.gov/sites/default/files/documents/fema_technical-job-aid-infrastructure-retrofit.pdf
- ASCE/Structural Engineering Institute: https://sp360.asce.org/PersonifyEbusiness/Merchandise/Product-Details/productId/233163464
- FEMA P-547, *Techniques for the Seismic Rehabilitation of Existing Buildings*: https://www.fema.gov/node/techniques-seismic-rehabilitation-existing-buildings
- ASCE 7: https://www.asce.org/asce-7/
- Hurricane Michael Recovery Advisory 1, *Successfully Retrofitting Buildings for Wind Resistance*: https://www.fema.gov/sites/default/files/2020-07/successfully-retrofit-buildings-wind_hurricane-michael-florida.pdf
- FEMA Design Guide: *Three-Dimensional Roof Snowdrifts*: https://www.fema.gov/sites/default/files/2020-07/fema_roof_snowdrift_design_guide.pdf
- FEMA P-957, *Snow Load Safety Guide*: https://www.fema.gov/sites/default/files/2020-07/fema_snow_load_2014.pdf
- FEMA P-804, *Wind Retrofit Guide for Residential Buildings*: https://www.fema.gov/sites/default/files/2020-08/fema_p804_wind_retrofit_residential_buildings_complete.pdf
- FEMA P-424, *Design Guide for Improving School Safety in Earthquakes, Floods, and High Winds*: https://www.fema.gov/sites/default/files/documents/fema_p-424-design-guide-improving-school-safety.pdf
- FEMA P-543, *Design Guide for Improving Critical Facility Safety from Flooding and High Winds*: https://www.fema.gov/sites/default/files/2020-08/fema543_design_guide_complete.pdf
- FEMA P-577, *Design Guide for Improving Hospital Safety in Earthquakes, Floods, and High Winds*: https://www.fema.gov/emergency-managers/risk-management/building-science/publications?name=&field_keywords_target_id=50665&field_document_type_target_id=All&field_audience_target_id=All
- FEMA P-2062, *Guidelines for Wind Vulnerability Assessments of Existing Critical Facilities*:

B.11. Secondary Power Source

B.11.1. OVERVIEW

Secondary power sources increase power system resilience and mitigate the impacts of natural hazards while increasing the resilience of critical functions.

The purchase and installation of secondary power sources and related equipment, such as hookups and transfer switches, are generally eligible if they are cost-effective, contribute to a long-term solution to the problem they are intended to address, and meet all other program eligibility criteria. Additional secondary power sources not listed below may be eligible and will be reviewed on a case-by-case basis.

B.11.1.1. Generator Overview

Generators, including combined heat power systems, are emergency equipment that provide a secondary source of power. The type of generator, portable or permanent (fixed), is irrelevant to the eligibility if the project that the generator is used for, or the generator (and related equipment), meet the requirements of the program and the HMA Guide.

A permanent generator, also referred to as a fixed or standby generator, is a permanently installed generator that provides power by being hard-wired into the facility's main distribution panel and can be started manually or automatically in the event of a power outage. During a power failure, an automatic transfer switch isolates the electrical wiring from the utility grid and signals the generator to start functioning. The generator begins to feed power to the lines. When power is restored, a reverse action takes place, the incoming feed is once again procured from utility lines, and the generator ceases to function and goes into a standby mode.

Portable generators work with stand-alone applications and are meant to temporarily energize a few critical applications via external cords. These are usually functional for a short period of time. Different models of portable units can be fueled using one or more energy sources, such as gasoline, diesel, biodiesel, solar, propane or natural gas.

Hookups provide a pre-installed connection for generators to be connected to the facility's electrical system quickly when needed. Transfer switches are devices that safely connect standby or emergency generators to the electrical system.

There are two types of transfer switches:

- **Manual transfer switches:** Used to transfer power between the utility and portable or optional standby generators. Manual transfer switches must be operated manually when utility power is lost and when it is restored. The switches can be wired to a separate subpanel to run essential circuits in the building, such as lights, or they can be wired to run the entire building

if the attached generator is sufficiently sized. Manual transfer switches are most used when a portable generator system is involved but may be used with fixed generators.

- **Automatic transfer switches:** Automatically starts the generator and provides power from the generator to the facility when a utility power loss is detected. Automatic transfer switches also retransfers the facility back to the utility when the utility power is restored and shuts down the generator. Automatic transfer switches can be beneficial because of their simplicity and automatic action but are generally more expensive. Automatic transfer switches are typically only used with fixed generators. Applicants should discuss their needs with a licensed electrician or a licensed electrical engineer to determine which type of transfer switch would be better suited for each project.

Fuel is needed for most generators to function. Natural gas is piped from a utility, while propane and diesel use fuel tanks. The diesel fuel tanks need some form of spill prevention, usually in the form of a double walled tank. Propane and diesel tanks are mounted on concrete pads. Diesel tanks can be mounted below the generator as a subbase fuel tank.

B.11.1.2. Solar Photovoltaic System Overview

Though historically, alternative sources of power have been generators fueled by non-renewable resources, other forms of power, such as solar photovoltaic technology, may be viable as an effective alternative source of power. Solar photovoltaic technology, as an alternative source of power, may reduce risk and loss of function. Certain solar photovoltaic system configurations can provide an alternative source of power if the electric utility experiences an outage. While it is generally impractical to provide sufficient energy generation for a facility to operate indefinitely or during prolonged power outages, it may be practical for solar photovoltaic and battery storage systems to have sufficient capacity to allow facilities to function fully or partially for short-duration power outages. For solar photovoltaic systems to be effective in reducing loss of function, energy storage sized to provide power to critical loads is essential while accounting for the solar energy generation in a day. For some critical facilities, a solar photovoltaic system may not meet performance requirements for the primary secondary power source.

B.11.1.3. Microgrid Overview

A microgrid is a group of interconnected energy-consuming devices and equipment (e.g., homes, businesses or industrial facilities) and distributed energy resources within clearly defined electrical boundaries that act as a single controllable entity with respect to the utility grid. These microgrids generally operate while connected to the utility grid but control capabilities such as smart controls, enable these microgrid systems to disconnect from the conventional utility grid, and operate autonomously to meet anticipated or potential utility outages.

A microgrid typically consists of a smart distribution network limited to a well-defined boundary, a load management system, distributed energy resources and storage solutions. Distributed energy resources generate power in the form of solar panels, wind turbines, engine generators or another power generation source.

With the ability to disconnect and operate independently, microgrid systems can provide for grid resilience, mitigate disturbances caused by natural disasters, and allow for faster system response and recovery. The presence of a storage system (e.g., battery), with sufficient capacity for the specific application, such as waiting out the transition of power during a utility outage (which could range from a few seconds or minutes to hours or even days), can also reduce the loss of function of critical infrastructure.

B.11.1.4. Backup Battery System Overview

A backup battery system is an energy storage resource capable of receiving electrical power from a conventional utility grid or other electrical power source and storing it for later use. Battery systems can be located at the transmission-system level or at the customer level. On the utility scale these systems are typically used for managing power demand, but on the customer level a battery system can be used to provide backup power during utility outage events. The battery system achieves this by being connected to the utility grid during normal utility operation so it can maintain a full charge, and when the system senses the utility source is inadequate, the system disconnects from the conventional utility grid to provide the customer with power.

Battery systems are measured by a kilowatt rating and a kilowatt-hour rating. The kilowatt rating is a measure of instantaneous power output. The kilowatt-hour rating is a measure of battery capacity. For example, a 50 kilowatt, 100 kilowatt-hour battery system could continuously supply power to a 25 kilowatt load for four hours but would not be able to sufficiently power a 75 kilowatt load, as the battery system kilowatt rating is too low.

With the ability to disconnect and operate independently, backup battery systems can provide for grid resilience, mitigate disturbances caused by natural disasters, and allow for faster system response and recovery. The battery system can be selected to meet the needs of the specific intended applications during a utility outage to reduce the loss of function of critical infrastructure. Subapplicants must clearly document how a proposed battery system's capacity, including limitations without a power source, can meet the performance requirements to support the resilience of critical functions.

B.11.2. SECONDARY POWER SOURCE: ELIGIBILITY

Secondary power sources for critical facilities must be protected as a Risk Category IV and a Flood Design Class 4 facility. For additional information about design classes, refer to ASCE 7. For additional information about flood design classes, refer to Table 7-1 in ASCE 24.

B.11.2.1. Generator Eligible Activities

Generators are emergency equipment that provide a secondary source of power to a facility. Generators and related equipment (e.g., hookups) are eligible under HMGP, HMGP Post Fire and BRIC if they contribute to a long-term solution to the problem they are intended to address. Generator projects must be cost-effective. If there is insufficient data to evaluate the generator project using standard BCA methods, the project may be eligible under the 5 Percent Initiative.

Generators and/or related equipment are eligible:

- As a stand-alone project if the generator protects a critical facility.
- As a functional portion of an otherwise eligible mitigation solution (whether the facility is critical or not).

Related equipment is eligible if it is necessary to distribute power efficiently and effectively from a generator (e.g., generator hookups and pads).

For generators that are components of larger projects, the costs and benefits from the generator, along with any related equipment, may be aggregated with the costs and benefits from the other part of the project.

For purposes of eligibility, the size of the generator may be relevant. In general, to be eligible the generator size must be appropriate for the facility; the appropriate size may vary by facility and generator usage. It is not always necessary for the generator to support a facility's operation to its full capacity, but it must be sized appropriately to ensure the facility can provide uninterrupted critical functions in the event of future power outages. Determining what facility functions the generator needs to support is crucial in selecting the correct generator for the facility. The rated output of the selected generator must be matched to the maximum anticipated capacity needed.

B.11.2.2. Solar Photovoltaic System Eligible Activities

Eligible solar photovoltaic mitigation projects incorporate the use of solar photovoltaic systems as an alternative source of power or as a distributed energy resource.

Solar photovoltaic systems are eligible:

- As a stand-alone project if the solar photovoltaic system(s) protects a critical facility. Individual communities may determine what is considered a critical facility within their area, and the facility must be noted in the hazard mitigation plan for that community.
- As a functional portion of an otherwise eligible mitigation solution (whether the facility is critical or not).
- If required by code and the project meets all other programmatic requirements (whether the facility is critical or not).

Related equipment, such as battery storage, is eligible if it is necessary to store power efficiently and effectively from the solar photovoltaic system.

FEMA will ensure the eligibility of solar photovoltaic systems in the context of specific facility needs. For the facilities that require standby power supply, a local alternative source of power (such as a generator) may be necessary in addition to a solar photovoltaic system to provide sufficient local generation to power critical loads during a grid outage. In addition, batteries for solar photovoltaic

systems may require significant storage space; this consideration should be addressed for the specific facility. Solar photovoltaic systems without an additional means of local generation are unlikely to be cost-effective and technically feasible, which are requirements for funding.

Documentation to demonstrate the feasibility and practicality of the proposed solar photovoltaic system must be provided to support project eligibility in the context of specific facility needs.

To be eligible for funding under HMA programs, the solar photovoltaic system configuration must be one of the following and be equipped with the features outlined below:

- The stand-alone solar photovoltaic system must be provided with an automatic disconnecting means that allows it to isolate from the grid if the system is grid connected.
- The capacity of the solar photovoltaic system and constituent equipment (including inverter and energy storage) proposed must reduce loss of function when the grid experiences an outage.

If the solar photovoltaic is a hybrid system, then the system must be provided with an automatic disconnecting means that allows it to isolate from the grid if the system is grid connected.

- The capacity of the generator, inverter and amount of energy storage proposed (if applicable) must reduce loss of function when the grid experiences an outage.
- If the hybrid system does not include a battery energy storage system, the following conditions must be fulfilled:
    - The capacity of the generator must be sized to serve all critical functions of the facility.
    - Reliable fuel sources must be available to support the generator.

B.11.2.3. Microgrid Eligible Activities

Microgrids are eligible under HMGP, HMGP Post Fire and BRIC. Unlike generators or solar photovoltaic secondary power sources, microgrids are not limited to critical facilities. Microgrid projects will be evaluated by FEMA on a case-by-case basis, given that they meet other program requirements.

B.11.2.4. Backup Battery System Eligible Activities

Backup battery systems are eligible under HMGP, HMGP Post Fire and BRIC. In general, to be eligible the battery system size must be appropriate for the facility. It is not often necessary for the battery system to support a facility's operation to its full capacity, but it must be sized appropriately to ensure the facility can provide uninterrupted critical functions in the event of future power outages. Determining what facility functions the backup battery system needs to support is crucial in selecting the correct battery system for the facility. The rated power output, in kilowatts, of the selected battery system must be matched to the maximum anticipated capacity needed. The rated energy storage

capacity, in kilowatt-hours, must be selected to provide emergency power for sufficient time to mitigate a loss of function due to a natural hazard or for a secondary power source to provide power to the facility and charge the battery system. While there is no minimum duration established, subapplicants must clearly document how long a proposed battery system can support the resilience of critical functions and ensure that duration is consistent throughout the subapplication, including the level of effectiveness assumed in the BCA.

Backup battery systems are eligible under the following scenarios:

- As a stand-alone project if the battery system protects a critical facility.
- As a functional portion of an otherwise eligible mitigation solution (whether the facility is critical or not).

Related equipment is eligible if it is necessary to distribute power efficiently and effectively from the backup battery system (e.g., convertors and pads).

For backup battery systems that are components of larger projects, the costs and benefits from the battery system, along with any related equipment, may be aggregated with the costs and benefits from the other part of the project.

B.11.2.5. Ineligible Activities

The purchase of a secondary power source must be for a critical facility or constitute a functional portion of an otherwise eligible mitigation solution. The purchase of a secondary power source for the singular purposes of maintaining power for a single residential structure is therefore not an eligible activity for purposes of HMGP, HMGP Post Fire and BRIC.

A general list of ineligible activities is included in Part 4.

B.11.2.6. Cost-Effectiveness

Applicants and subapplicants must demonstrate that mitigation projects are cost-effective. Projects must be consistent with Part 5.

Information needed for performing the BCA for secondary power source projects may vary by facility. The following are typically key inputs in the BCA for purposes of secondary power source projects:

- **Project useful life:**
  - Generators: According to OMB Circular A-76 - Revised Appendix 3, *Useful Life and Disposal Value*, the useful life for generators or generator sets is 19 years. This value can be used as the default useful life value when performing the BCA. It may be altered based on manufacturer warranty or other documentation that can demonstrate that the generator may be able to provide service for longer than 19 years.

- Solar photovoltaic systems: The project must provide an alternative source of power for short-duration power outages over the project useful life. According to the National Renewable Energy Laboratory, the project useful life of a solar photovoltaic system ranges from 25 to 40 years. The subapplicant should demonstrate and document the rationale for the chosen project useful life of a solar photovoltaic system.

- Microgrids: The project useful life ranges from 20 to 35 years and is most likely dependent on the secondary power source. The project useful life can be estimated longer dependent on the microgrid components and whether maintenance cost is incorporated to account for components being replaced.

- Battery backup systems: The current project useful life typically lasts up to 10 years.

- **Project costs**: The cost of a secondary power source varies by size, installation and purpose. The secondary power source's size and specifications must be reasonable, appropriate and necessary to continuing the critical functions of the facility. The subapplicant should (1) provide the exact costs for the secondary power source, installation and components and (2) include the costs in the BCA.

- **Facility and value of service**: For potable water, wastewater, police and fire stations and hospital facilities, analyses can be performed via the Historic/Professional Expected Damage methodology in the BCA Toolkit, which provide service values for these facilities. To use these values, the BCA Toolkit requires information regarding the population served by the facility. For example, if a secondary power source is to be installed at a wastewater treatment plant, the BCA Toolkit user must input how many customers are served by the facility and how many days the facility was inoperable because of power failure. These values can typically be obtained from the facility manager and can be provided on official letterhead for documentation purposes.

- **Recurrence intervals**: Recurrence information used in the analysis may vary by location or by the hazard that is anticipated to be or is the cause of power failure, such as wind or flood.

- **Other benefits**: Other benefits (or costs avoided) may be included if they are addressed by the secondary power source project if they are a direct result of interrupted power service that a secondary power source would have mitigated.

Information on pre-calculated benefits for generators for certain types of hospital projects can be found in Part 12.B.11.2.6.3 or on the FEMA "Benefit-Cost Analysis" webpage.

B.11.2.6.1. Recurrence Intervals

The following tools may be useful in determining a recurrence interval for secondary power source projects:

- If the facility lost power because of wind damage to power lines feeding the facility, the analyst can use the Applied Technology Council Wind Speed Tool to determine the frequency of the coastal wind event.
- If power outages are attributed to flooding, recurrence information for the flooding event should be used in the analysis. The National Weather Service's Precipitation Frequency Data Server can be used to establish a frequency for various precipitation events.
- U.S. Geological Survey stream gauge data can also be used to extrapolate frequency information for flood events; details of this can be found in the *Supplement to the Benefit-Cost Analysis Reference Guide* FEMA guidance (June 2011).
- The National Snow and Ice Data Center.
- Default values from the generator module of the BCA Toolkit.
- Insurance claims, damage repair records or data from a state/local agency or local government newspaper accounts citing credible sources (other than anecdotal accounts) could be used in conjunction with the Unknown Frequency Calculator within the BCA Toolkit. Using this method may require more time as three events are required to complete the analysis.

B.11.2.6.2. Additional Benefits

All costs associated with power failure that would be mitigated by a secondary power source should be considered. For example, a wastewater treatment plant sometimes requires additional costs to bring the facility back to operating status after an extended power failure. This may include the removal of sludge in equipment or additional labor hours needed to bring the facility back to operational status. Those additional costs can be included above and beyond the value of service costs if a secondary power source would have prevented those additional costs.

To the extent they can be captured and justified, environmental cleanup costs associated with raw sewage discharge can be included in the BCA for wastewater treatment plants. FEMA does not have a default value for these associated costs, and these costs will vary by location. The subapplicant should include all reasonable costs that will be mitigated by having a secondary power source installed at a facility.

Additionally, finding the value (in loss of service terms) of a state emergency operations center to prove the cost-effectiveness of a secondary power source project is difficult. FEMA will allow reasonable and justified loss of service costs for state and local emergency operations centers identified by the subapplicant to be entered into the BCA Toolkit to evaluate the cost-effectiveness of an emergency operations center secondary power source project. An additional option is to investigate the costs of remobilizing an emergency operations center to an alternate/continuity of operations location that could be avoided should the emergency operations center be supplied with an uninterruptible power source.

B.11.2.6.3. Pre-Calculated Benefits for Hospital Generators

FEMA established the use of a pre-calculated benefit to demonstrate cost-effectiveness for certain hospital generator projects.

The pre-calculated benefit is available for hospital generator projects if all the following requirements are satisfied:

- The hospital must have an emergency department.
- The project represents a stand-alone solution.[486] The subapplication must provide enough information to demonstrate technical feasibility and effectiveness of the mitigation solution. This includes information from a licensed design professional for cost, generator capacity related to critical services throughout the hospital, and scope for a transfer switch, fuel storage and other required components.
- If the generator is part of a larger project, the pre-calculated benefits from the generator portion cannot be combined or aggregated with the benefits from another portion of the project.
- The total cost of the project must be less than or equal to the pre-calculated benefits.[487]
    - The pre-calculated benefits for a hospital generator project are $6.95 per hospital building gross square footage in urban areas and $12.62 per hospital building gross square footage in rural areas.[488] For purposes of this pre-calculated benefit, "urban" is defined as any location within an urbanized area as defined by the Census Bureau.[489] "Rural" is defined as any location outside of an urbanized area (including urban clusters).
    - Furthermore, all locations in Alaska, Hawaii, Puerto Rico, the U.S. Virgin Islands and other island territories are considered rural for the purposes of this pre-calculated benefit. The applicant or subapplicant must use the address or latitude/longitude of the hospital to determine urban/rural status; this designation cannot be applied countywide or across Metropolitan Statistical Areas.

Documentation that the project meets the criteria above must be included in the project subapplication to use this pre-calculated benefit to demonstrate cost-effectiveness. Cost estimates must be based on industry standards, vendor estimates or other reliable sources.

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[486] See, for example, 44 CFR 206.434(c)(4). In other words, at the completion of the generator project, the project solves the problem independently and has all elements necessary to be fully capable of supplying power to the critical services throughout the hospital.

[487] Total project costs include all project costs, not just the federal share.

[488] A hospital in a rural area would have higher benefits than in an urban area because of the greater average distance to the next nearest hospital.

[489] The Census Bureau is the only acceptable source for determining whether a location is within an urbanized area.

B.11.2.7. Environmental and Historic Preservation

All subapplications submitted to FEMA must meet the EHP eligibility criteria in Part 4. All subapplications must have a scoping narrative in accordance with Part 6.

B.11.3. SECONDARY POWER SOURCE: APPLICATION AND SUBMISSION INFORMATION

All subapplications submitted to FEMA must meet the eligibility criteria in Part 4. All subapplications must have a scoping narrative in accordance with Part 6. Project-specific criteria are highlighted below.

FEMA may request additional information after the subapplication has been submitted to ensure all necessary information is received. However, all information required by the regulations and the HMA Guide must be received before an assistance decision and award or final approval can be made.

The subapplication must include the following:

- **Scope of work**: Provide a project scoping narrative identifying the proposed mitigation action and structures requesting backup power, including a description of the proposed activities, information on the critical facility, mitigation alternatives and an explanation of how the project will mitigate risk. The scope of work must include key milestones and correspond with the design information, project schedule and budget.
    - Solar photovoltaic systems must be designed in accordance with relevant industry standards and best practices to accomplish the intended risk reduction. Applicable design standards may vary depending on the proposed project and facility type. In addition, the subapplicant must work with the authorities having jurisdiction to ensure that all state and local requirements are being met.
    - Microgrids must be designed in accordance with relevant industry standards to accomplish the intended risk reduction. Examples include the *Standard for Interconnection and Interoperability of Distributed Energy Resources with Associated Electric Power Systems Interfaces (IEEE 1547)* and the *Guide for Smart Grid Interoperability of Energy Technology and Information Technology Operation with the Electric Power System (IEEE 2030), End-Use Applications, and Loads*.
    - Backup battery systems must be designed in accordance with relevant industry standards to accomplish the intended risk reduction. Examples include the International Electrotechnical Commission and Underwriters Laboratories Inc. standards.
    - The subapplicant must illustrate that the project is either a stand-alone solution (incorporating new control capability, load management systems, distributed energy resources or storage solutions into an already resilient grid) or a component of an overall solution (new solutions being implemented along with retrofit measures to make the distribution of power more resilient).

- **Technical data to support the scope of work**: Technical data is necessary to demonstrate that a project is feasible and effective at reducing risk. This data may consist of information such as engineering or design plans showing the existing electrical system including the utility transformer(s) and the proposed secondary power source size, interconnections and fuel source. This information can be further developed following the award and should be accounted for in the scoping narrative, schedule and budget if not available during application development.

- **Critical facility information**: The information is necessary to demonstrate that the project is feasible and effective at reducing risk. Information on the facility may include the date the structure was built, building type and the functions provided, construction type, and additional details relating to the existing condition of the structure.

- **Project schedule**: The application must include a detailed project schedule for all tasks identified in the project budget and the scope of work. The schedule identifies major milestones with start and end dates for each activity. Project schedules must show completion of all activities (including construction period) within the period of performance allowed by the relevant HMA program. Sufficient detail must be provided so FEMA can determine whether the proposed activities can be accomplished within the period of performance.

- **Project budget**: The project budget must contain a detailed line-item budget for all tasks identified in the project schedule and the scope of work. All costs included in the application should be reviewed to verify they are necessary, reasonable and allocable consistent with the provisions of 2 CFR Part 200. Include sufficient detail so that FEMA can determine whether costs are reasonable based on proposed activities and level of effort. Costs incurred prior to award may be considered pre-award costs (and eligible for reimbursement) if they are incurred after the date of the major disaster declaration (HMGP and HMGP Post Fire). For BRIC and FMA, refer to the relevant Notice of Funding Opportunity for eligibility of pre-award costs.

- **Project location map**: The application must include a map showing the project location. If the project includes multiple sites, the map should show the project boundaries, including the staging area.

- **Property location information**: An application must contain the physical address and latitude and longitude coordinates to the nearest sixth decimal place of each critical facility in the project application. If the project has multiple properties, the information for all properties should be provided. In general, a post office box number is not an acceptable address. If the address provided does not clearly match up with the structure(s) to be mitigated, provide photos or a site map with the structure(s) footprint(s) clearly identified.

- **Flood Insurance Rate Map**: The applicant should determine whether the project is located in a floodplain and provide a FIRM showing the project location. The applicant should include a

description of the flood zone in which the existing structure is located and whether the site is in a regulatory floodway.

- **Description of the hazard to be mitigated**: The application must include information on the risk to be mitigated. Mitigation projects assisted under HMGP, HMGP Post Fire and BRIC must demonstrate the proposed mitigation activity will address a problem that has been repetitive or that poses a significant risk to public health and safety if left unresolved. Secondary power source projects must document the risk to the critical facility from natural hazards. Because multiple natural hazards can disrupt power supply, specify which hazard(s) is causing the loss of power that the secondary power source will mitigate and provide documentation of the hazard's risk. The risk to be mitigated can be based on either documented historical damage (such as loss of function during a previous disaster event) or professionally expected damage (estimated damage that has not yet occurred or that occurred but not to the extent possible).

Subapplicants may apply for subrecipient management costs to cover administrative costs. Management costs must be included in the subapplication budget as a separate line item. More information about the requirements for management costs request can be found in Part 13.

B.11.4. SECONDARY POWER SOURCE: SUBAWARD IMPLEMENTATION

The following are basic steps in implementing an approved HMA secondary power source project:

1. Pre-construction (carry out design process, seek technical consultant, prepare cost estimate, obtain building permits, hire project manager, hire construction manager/contractor).
2. Prepare site.
3. Install foundations and supports as needed.
4. Install secondary power source and supporting equipment.
5. Connect to utilities, battery system and/or to fuel system, as appropriate and required.
6. Conduct inspections.
7. Complete load testing.
8. Prepare operations and maintenance plans/agreements, which should include regular startup testing and load testing. Secondary power sources serving buildings should be tested in accordance with the latest published edition of NFPA 110, *Standard for Emergency and Standby Power Systems*.

Post-award monitoring helps ensure subrecipients are achieving the objectives of the federal award consistent with the performance goals and milestones described in the subaward. To assist the recipient in monitoring secondary power sources projects, the following milestone information or events should be included in Quarterly Progress Reports:

- If the subrecipient is acquiring contract support, the subrecipient should report when the request for proposal is completed, when the contract is out for bid, when the bid period closes, when proposals are reviewed, when the contractor is selected and the date of the kickoff meeting
- Describe the current status including a summary of:
  - Recent progress and planned work.
  - Risks identified or changes from the milestones/deliverables submitted with the scope of work (e.g., financial concerns, coordination issues with state or local governments and utilities, project management or contracting issues, legal disputes, and significant changes impacting construction activities or timelines such as delays due to weather, materials, procurement or labor issues).
- When construction has started, is substantially complete or completed.
- Any other milestones that have been identified in the subapplication or agreed to or are required by the recipient.

B.11.4.1. Budget and Scope Work Change

Recipients are required to report deviations from budget, project scope or objectives in accordance with Part 8. Recipients must request prior approvals from FEMA for budget and program plan revisions.[490] If the final design is not complete prior to award, once the project is awarded, the design must be finalized by a licensed design professional. Any changes to the scope of work or budget because of completing the final design or to address permitting requirements must be consistent with Part 8. Construction design activities are defined as construction activities; therefore, budget changes involving them must be consistent with Part 8.F.2.

B.11.5. SECONDARY POWER SOURCE: CLOSEOUT

Recipients and subrecipients must closeout projects in a timely manner consistent with Part 9.

In addition to the typical HMA program closeout procedures, closeout of secondary power source projects generally includes:

- Inspection report that verifies all work noted in the scope of work was completed and is consistent with the size, specifications and instillation method identified in the scope of work. The report must indicate the date the inspection was completed and who completed the inspection.

[490] 2 CFR § 200.308

- Latitude/longitude to the nearest sixth decimal place of the project site and secondary power source location.
- Clearly labeled photographs, which must include a picture of the transfer switch. Photographs should also include a general overview of the installation and close-up views of the secondary power source.
- For portable generators, Standard Form 428, *Tangible Personal Property Report*, must be submitted if applicable to comply with disposition of equipment requirements. For more information, refer to Part 9.

B.11.6. SECONDARY POWER SOURCE: RESOURCES

Secondary Power Source Resources

- EHP Review job aids: https://www.fema.gov/grants/guidance-tools/environmental-historic/preparation-resources
- FEMA BCA: https://www.fema.gov/grants/guidance-tools/benefit-cost-analysis
- OMB Circular A-76, Performance of Commercial Activities: https://www.whitehouse.gov/wp-content/uploads/legacy_drupal_files/omb/circulars/A76/a076.pdf
- Applied Technology Council Wind Speed Tool: https://hazards.atcouncil.org/
- Precipitation Frequency Data Server: https://hdsc.nws.noaa.gov/hdsc/pfds/
- National Snow and Ice Data Center: https://nsidc.org/
- Solar Photovoltaic Energy System Calculator: https://pvwatts.nrel.gov/index.php
- Online Generator Sizing Software (Caterpillar): https://specsizer.cat.com/

B.12. Warning System

B.12.1. WARNING SYSTEMS: OVERVIEW

Warning residents of impending hazards and automating certain risk reduction functions can reduce damage from natural disasters and may be used to increase accessibility to people with disabilities and others with access and functional needs.

B.12.2. WARNING SYSTEMS: ELIGIBILITY

In general, warning systems may be eligible for HMA if they meet the general program eligibility requirements, including feasibility and cost-effectiveness. For HMGP, HMGP Post Fire and BRIC earthquake early warning system project eligibility, refer to Part 12.B.12.2.1.1.

For purposes of HMGP and HMGP Post Fire, equipment and systems to warn residents of impending hazards are generally eligible under the 5 Percent Initiative. For more information on the 5 Percent Initiative, refer to Part 10. Since Oct. 5, 2020, earthquake early warning systems are also authorized under Section 404 of the Stafford Act for general HMGP assistance if the conditions outlined in Part 12.B.12.2.1 are met.[491]

For purposes of BRIC, warning projects are generally eligible if they meet program requirements. When seeking assistance for these projects, it is important that applicants describe how the system will be used to reduce potential injury and damage from a natural disaster (i.e., what actions will be associated with the warning).

Eligible warning projects include but are not limited to warning systems for the following:

- **Tornado sirens**: Some communities with frequent tornado watches and warnings have tornado sirens to give audible warning to residents in an area with a tornado warning. Other systems can alert the public through cell phones, such as the Integrated Public Alert and Warning System. It is a national system for local alerting that provides authenticated emergency alert and life-saving information messaging to the public through mobile phones using Wireless Emergency Alerts and to radio and television via the Emergency Alert System.
- **Tsunami warning systems**: Tsunami warning systems are used to issue warnings to the public to enable timely evacuation from coastal and other areas vulnerable to inundation. Tsunami warning systems can be used to notify the public of tsunami watches and warnings as they are issued by the U.S. Tsunami Warning System. Some tsunami warning systems consist of warning sirens, while others alert the public using wireless alerts issued via cell

[491] Public Law 100-707 (Nov. 23, 1988); amending the Disaster Relief Act of 1974, Public Law 93-288 (May 22, 1974); 42 U.S.C. § 5170c

phone, radio, or television. Tsunami warning systems can also include signage to direct individuals to safe zones outside of the tsunami inundation area.

- **Enhanced or reversed 911 systems**: Enhanced 911 systems automatically provide the caller's location to the 911 dispatchers. These systems may provide an address or latitude and longitude so that cell phone users' locations can be determined. Reverse 911 systems allow safety organizations to alert individuals and businesses to the risk of danger by sending a recorded voice message to landline telephones and a recorded voice message or text message to registered cell phones within a defined geographic area.

- **Weather stations/rain gauges**: Weather stations typically monitor a combination of indoor and outdoor temperature, humidity and barometric pressure. Complete weather stations also monitor wind and rain using wind sensors and rain gauges, and some also measure ultraviolet index, soil moisture and water temperature. Rain gauges collect and measure the amount of rain that falls during a given period of time per unit area. They can be part of a total weather station or an independent piece of equipment. Meteorologists and hydrologists use the information from these stations to predict future weather and refine forecast models.

- **Wildfire warning signs**: Installing warning equipment and systems, including electronic signs and signals, for warning residents about wildfire hazards and hazard identification-related equipment is an eligible activity under the 5 Percent Initiative. The general intent of these signs is to provide warning of fire risk and/or evacuation orders for people in the area.

B.12.2.1. Earthquake Early Warning Systems Eligibility

B.12.2.1.1. Eligible Activities

HMGP and BRIC recipients may leverage assistance to support building capability for earthquake early warning systems. Earthquake early warning systems use seismic instrumentation to monitor seismic activity in real time to detect significant earthquakes near the source and transmit those signals to a seismic monitoring network. The monitoring network can quickly send out a warning to alert people within the region before shaking arrives.

The following three categories of activities that support building capability for earthquake early warning may be assisted under HMGP, HMGP Post Fire and BRIC:

- Regional seismic networks.

- Geodetic networks.

- Seismometers, global positioning system receivers and associated infrastructure such as telemetry or computer processing needed to build capability for an earthquake early warning system designed as part of the Advanced National Seismic System or other existing state- or federally-supported earthquake monitoring networks. They must be part of a system that enables end user notification. FEMA, in consultation with the U.S. Geological Survey,

determined the Advanced National Seismic System ShakeAlert system is the only system that currently enables end user notification.

Seismic and geodetic sensors and infrastructure assisted under HMGP, HMGP Post Fire or BRIC must be integrated into an existing operational earthquake monitoring network, and data from these sensors must be freely available to the public.

B.12.2.1.2. Ineligible Activities

HMGP, HMGP Post Fire and BRIC assistance are not available for earthquake early warning systems' operations and maintenance costs. A general list of ineligible activities is included in Part 4.

B.12.2.1.3. Cost-Effectiveness

Earthquake early warning systems are exempt from the requirement to demonstrate cost-effectiveness.

B.12.2.2. Environmental and Historic Preservation

All subapplications submitted to FEMA must meet the EHP criteria in Part 4. All subapplications must provide the information described in Part 6 so that FEMA may perform the EHP review.

B.12.3. WARNING SYSTEMS: APPLICATION AND SUBMISSION INFORMATION

All subapplications submitted to FEMA for warning systems must meet the eligibility criteria in Part 4. All subapplications must have a scoping narrative in accordance with Part 6. Project-specific criteria are highlighted below.

FEMA may request additional information after the subapplication has been submitted to ensure all necessary information is received. However, all information required by the regulations and the HMA Guide must be received before an assistance decision and award or final approval can be made.

Subapplicants may apply for subrecipient management costs to cover administrative costs. Management costs must be included in the subapplication budget as a separate line item. More information about the requirements for management cost requests can be found in Part 13.

B.12.3.1. Earthquake Early Warning Systems Subapplications Requirements

Subapplications will need to clearly demonstrate how the proposed activities will integrate into seismic monitoring networks to build earthquake early warning capability and help to reduce risk from earthquakes. A benefit-cost analysis is not required. Applicants are encouraged to consult with their FEMA region to determine the appropriate level of data needed to submit a subapplication for earthquake early warning.

B.12.4. WARNING SYSTEMS: SUBAWARD IMPLEMENTATION

Post-award monitoring helps ensure subrecipients are achieving the objectives of the federal award consistent with the performance goals and milestones described in the subaward. To assist the recipient in monitoring warning system projects, the following milestone information or events should be included in Quarterly Progress Reports:

- If the subrecipient is acquiring contract support, the subrecipient should report when the request for proposal is completed, when the contract is out for bid, when the bid period closes, when proposals are reviewed, when the contractor is selected and the date of the kickoff meeting.
- Describe the current status including a summary of:
  - Recent progress and planned work.
  - Risks identified or changes from the milestones/deliverables submitted with the scope of work (e.g., financial concerns, coordination issues with state or local governments and utilities, project management or contracting issues, legal disputes, and significant changes impacting construction activities or timelines such as delays due to weather, materials, procurement or labor issues).
- When construction has started, is substantially complete or completed.
- Any other milestones that have been identified in the subapplication or agreed to or are required by the recipient.

B.12.4.1. Budget and Scope of Work Change

Recipients are required to report deviations from budget, project scope or objectives in accordance with Part 8. Recipients must request prior approvals from FEMA for budget and program plan revisions.[492] If the final design is not complete prior to award, once the project is awarded, the design must be finalized by a licensed design professional. Any changes to the scope of work or budget because of completing the final design or to address permitting requirements must be consistent with Part 8. Construction design activities are defined as construction activities; therefore, budget changes involving them must be consistent with Part 8.F.2.

B.12.5. WARNING SYSTEMS: CLOSEOUT

Recipients and subrecipients must closeout projects in a timely manner consistent with Part 9.

[492] 2 CFR § 200.308

B.12.6. WARNING SYSTEMS: RESOURCES

Warning Systems Resources

- FEMA BCA: https://www.fema.gov/grants/guidance-tools/benefit-cost-analysis
- FEMA EHP review job aids: https://www.fema.gov/grants/guidance-tools/environmental-historic/preparation-resources
- Revised technical implementation plan for the ShakeAlert system: https://pubs.er.usgs.gov/publication/ofr20181155
- Advanced National Seismic System Policy and Procedures Documents: https://www.usgs.gov/natural-hazards/earthquake-hazards/anss-advanced-national-seismic-system

B.13. Aquifer Recharge, Storage and Recovery

Aquifer recharge, storage and recovery projects primarily serve as a drought mitigation technique but can be used to reduce flood risk, mitigate saltwater intrusion, and restore aquifers that have been subject to overdraft.

B.13.1. AQUIFER RECHARGE, STORAGE AND RECOVERY: OVERVIEW

Aquifer recharge, storage and recovery projects are designed to lessen the impacts of drought to the water supply. Aquifer recharge, storage and recovery projects include increasing surface water infiltration into an aquifer to be stored for a period until it is needed and then recovered for use. This can be done through direct well injection, infiltration pits and basins, or surface spreading.

The concept of aquifer recharge, storage and recovery is to:

- Capture water when there is an abundant supply such as during a rainy season or during spring snow melts.
- Store the water in subsurface aquifers.
- Recover the water when needed. Storing water underground can help protect it from pollutants, evaporation and weather events as well as maintain stream flow during periods of low flow.

There are two types of aquifers, confined and unconfined:

- A **confined aquifer** is a closed system that, for these projects, can only be recharged using an injection well. The project design includes a "mixing zone," which is created between the injected water and native groundwater to ensure variations in water quality are managed safely and effectively.
- An **unconfined aquifer** can be recharged either by using an injection well or by allowing surface water to infiltrate and seep into the aquifer. Through infiltration, the surface water helps replenish groundwater supplies; the surface water mixes with native groundwater and slowly flows through the aquifer. The appropriate method of recharge, source and treatment of water added to the aquifer is based on specific site conditions and may include drinking water, raw and/or partially treated surface water and, infrequently, raw groundwater or reclaimed water. Communities can recover the stored water from the aquifer by using a well and use the water as a fresh water supply.

As a drought mitigation technique, aquifer recharge, storage and recovery projects offer advantages over other project types:

- Because aquifer recharge, storage and recovery is a subsurface storage technology, it is more resilient and protected than the alternative and more traditional storage technologies such as reservoirs or surface impoundments.
- The stored water in an aquifer recharge, storage and recovery system is protected from evaporation and extreme weather events.
- Unlike reservoirs or other surface storage, there is no potential for levee failure and downstream flooding.
- Aquifer recharge, storage and recovery can also protect freshwater supplies along coastal areas as a barrier or protection for saltwater intrusion driven by sea level rise.

B.13.2. AQUIFER RECHARGE, STORAGE AND RECOVERY: ELIGIBILITY

The following sections highlight eligible activities and costs for aquifer recharge, storage and recovery projects. Aquifer recharge, storage and recovery projects are eligible for assistance under HMGP, HMGP Post Fire, BRIC and FMA. To be eligible under FMA, an aquifer recharge, storage and recovery project must provide flood mitigation benefits to NFIP participating communities and demonstrate the elimination of future claims against the NFIP.

B.13.2.1. Eligible Activities

Eligible aquifer recharge, storage and recovery activities may include:

- Data analyses/investigations directly related to the mitigation project (including groundwater and geotechnical investigations, water supply modeling, engineering reports, hydrogeological data collection and hydraulic analyses).
- Permitting costs and activities.
- Costs related to complying with local utility requirements.
- Site preparation, materials and construction.
- Professional services necessary to design, manage and implement the project.
- Project planning and design activities, including construction verification.
- Measures to avoid or treat adverse effects to historical properties and cultural resources.
- Drilling.
- Piping, injection wells, and extraction wells and associated equipment.
- Intake structures and associated piping/equipment.

- Pump stations.
- Infiltration basins.
- Monitoring wells.
- Water quality testing during system setup.
- Water treatment systems for injection and/or potable water supply.

B.13.2.2. Ineligible Activities

Aquifer recharge, storage and recovery projects that address, without an increase in the level of protection, the operation, deferred or future maintenance, rehabilitation, restoration, repair or replacement of existing structures, facilities or infrastructure or that do not address drought and increased water supply to the community are not eligible.

In addition, ineligible costs associated with aquifer recharge, storage and recovery projects include, but are not limited to, general geotechnical or hydraulic studies that are not specifically related to the project site of the proposed mitigation activity. However, engineering costs associated with the design (hydrologic and hydraulic calculations) and benefit cost are acceptable.

A general list of ineligible activities is included in Part 4.

B.13.2.3. Cost Effectiveness

Applicants and subapplicants must demonstrate that mitigation projects are cost-effective. Projects must be consistent with Part 5.

While the Office of Management and Budget Circular A-94: Guidelines and Discount Rates for Benefit-Cost Analysis of Federal Programs describes an exemption for water resources projects (refer to the White House Council on Environmental Quality's *Updated Principles, Requirements and Guidelines for Water and Land Related Resources Implementation Studies* [PR&G] [Dec. 2014]), the cost-effectiveness requirement in the HMA program authorizing statutes must be met. The cost-effectiveness determination should be supplemented by consideration of the PR&G criteria if applicable.

The primary benefit of an aquifer recharge, storage and recovery project is to enhance or increase water supply for drought mitigation by storing excess seasonal flood flows. The stored water can be pumped out of the aquifer (recovered), treated and used as a freshwater supply when additional water supply is needed, such as during periods of drought. To be used as a benefit for the FEMA BCA Toolkit, this water must be used primarily for services to the community, as the primary purpose of FEMA's hazard mitigation programs is to protect life, buildings and infrastructure.

Communities may use aquifers for annual water resource management or longer-term water supply for more extreme needs. For example, they can recover only a portion of the stored water for use

during high-demand times or seasonal dry periods and preserve a significant quantity of water in the aquifer for use during a drought. Aquifer recharge, storage and recovery systems can take advantage of the flexibility of using multiple types of source water and be designed and operated to help mitigate the effects of increased demand and drought in various communities with differing water resources.

At a minimum, the project application must identify the increased water supply capacity the aquifer recharge, storage and recovery project would provide in relation to the population that will be supported in a drought and during the project's useful life. A recurrence interval for drought periods must be identified to use the BCA Toolkit.

Estimating the probability of a drought can be difficult because of historical data gaps and variance in annual weather patterns/precipitation. Both the public and private sector have available modeling information that may help inform recurrence intervals for drought. There is not currently a single methodology to establish a recurrence interval for drought, but FEMA encourages communities to use the best available data to document a recurrence interval based on historic trends.

An aquifer recharge, storage and recovery project may be designed in a way that also provides flood risk reduction. If a flood mitigation component can be demonstrated, the methodologies in the current BCA Toolkit can be used to evaluate the cost-effectiveness of the overall project. An aquifer recharge, storage and recovery project may provide additional benefits if the applicant can demonstrate a reduction in subsidence and reduce structural damage to homes and properties in the vicinity.

B.13.2.4. Feasibility and Effectiveness

Projects must be consistent with Part 3. Mitigation projects assisted by HMA must be both feasible and effective at mitigating the risks of the hazard(s) for which the project was designed. A project's feasibility is demonstrated through conformance with accepted engineering practices, established codes, standards, modeling techniques and best practices.

Some water use projects are subject to water rights laws, which vary by jurisdiction. In the western U.S., the process of obtaining water rights may take several years. Where possible, water rights should be obtained prior to application submission to prevent delays.

Additionally, state or local water use permits may be applicable. Any permits governing the ability to withdraw source water or abstract and use groundwater, including recharged groundwater, must be considered in the planning process for all aquifer recharge, storage and recovery projects.

B.13.2.4.1. Appropriate Site Selection

Appropriate site selection and an aquifer's availability to a community are key items to evaluate when considering an aquifer recharge, storage and recovery project for flood risk reduction and/or drought mitigation. Appropriate siting of the project and the specific site conditions will impact the project design, source of water for recharge, method of injecting or infiltrating the water, and

efficiencies in recovering the water. Advances in hydrogeologic assessment techniques have made it easier to ensure proper selection of the project site and water storage zones in the aquifer.

B.13.2.4.2. Contaminants to the Underground Water Supply

During the project identification and planning phase potential contaminants to the underground water supply must be identified. The subapplicant should have a plan for managing potential leaching or contamination. The project application must address all potential impacts to environmental resources, including water quality, and provide the information necessary for FEMA to ensure compliance with environmental requirements. FEMA recommends that subapplicants consult federal, state and local regulatory agencies, as applicable, that provide permits and authorizations for aquifer recharge, storage and recovery projects to ensure all requirements will be met for a project. Subapplicants should also consult technical experts when developing an aquifer recharge, storage and recovery project to ensure the project is in an appropriate site and necessary methods and measures are in place to preserve water quality standards.

B.13.2.5. Environmental and Historic Preservation

All subapplications submitted to FEMA must meet the EHP criteria in Part 4. All subapplications must provide the information described in Part 6 so that FEMA may perform the EHP review. FEMA, in consultation with appropriate federal and state agencies, will use the information provided in the application to ensure compliance with EHP requirements. This may include demonstrating methods to incorporate public participation in the review process and/or mitigate any EHP impacts resulting from the mitigation action.

Project applications must include the necessary data and information for FEMA to conduct the appropriate EHP review. Because of the underground storage nature of aquifer recharge, storage and recovery projects, the project application should address issues and methods to monitor and protect the stored water from potential contaminants. Additional permits, such as a National Pollution Discharge Elimination System permit (under the Clean Water Act), or state and/or local permits or approvals, may be applicable to aquifer recharge, storage and recovery projects. States may also have groundwater standards that may be incorporated in permits and authorizations that should be addressed.

Issues and methods should include consideration of the impacts, if any, of injected water on native water quality and potential sources of contamination from the injected water or leaching from the aquifer walls into the underground water supply. FEMA, in consultation with appropriate federal and state agencies, uses the information provided in the application to ensure compliance with EHP requirements. Aquifer recharge, storage and recovery projects also must comply with EPA's Underground Injection Control program (under the Safe Drinking Water Act), which regulates injection well operations to prevent the contamination of underground sources of drinking water. Therefore, FEMA determines whether all the requirements of the Underground Injection Control program are satisfied when considering aquifer recharge, storage and recovery projects for HMA.

In some cases, the Environmental Protection Agency Underground Injection Control program has been delegated to states, territories and tribes for implementation or local governmental authority may have additional requirements. Applicants must verify that the requirements of the agency with jurisdiction over the aquifer recharge, storage and recovery project, if any, are met.

B.13.2.6. Aquifer Recharge, Storage and Recovery: Application and Submission Information

All subapplications submitted to FEMA must meet the eligibility criteria in Part 4. All subapplications must have a scoping narrative in accordance with Part 6. Project-specific criteria are highlighted below.

FEMA may request additional information after the subapplication has been submitted to ensure all necessary information is received. However, all information required by the regulations and the HMA Guide must be received before an assistance decision and award or final approval can be made. For aquifer recharge, storage and recovery projects, the subapplication must include the following:

- Site map(s) and location information including the water sources within the service area and the population that will be impacted.
- Site photographs of the proposed project area.
- Narrative of the drought risk being mitigated, including drought history and projected trends in the service area, if available.
- Description of the existing conditions of the project area, such as the existing infrastructure and existing condition of the aquifer.
- Description of how the project will reduce drought impacts and specify the increased water supply the project will provide.
- Description of the population that will benefit from the project.
- Description of the water source(s) for the project.
- Description of all local, state and federal permitting requirements.
- Documentation to demonstrate that the subapplicant has obtained all necessary water rights for the project, if applicable.
- Documentation of at least two alternatives that were considered as part of the planning process. One alternative may be a “no action alternative” that would reflect the impacts if no action were taken. Describe why the selected project was the most practical, effective and environmentally sound alternative.

- Description of proposed activity, including timelines, deliverables and tasks required to complete the proposed activity.
- Documentation that the project can independently solve the problem and is a functional portion of a solution. Projects that are dependent on a contingent action to be effective or feasible are not eligible.
- Description of the project components (e.g., materials, structural design, maintenance, and how the project will fit in with surrounding systems).
- Description of construction activities (e.g., site access, storage and security; site preparation; temporary construction; earthwork, including importation of fill or disposal of fill; installation of conveyance features; installation of injection well; and repairs to infrastructure that might be damaged during construction, such as temporary or permanent relocation of utilities

In addition to the items identified in Part 6, the following technical data is required:

- Design plans, specifications and engineering analysis (such as design calculations and minimum level of protection provided by the project).
- Hydrologic, geologic and hydrogeologic information (e.g., hydrologic and hydraulic models, aquifer types, aquifer and vadose zone characteristics, subsurface homogeneity/heterogeneity, hydrologic conductivity, transmission rates, storage coefficients and water temperatures).
- System water balance, demand studies and safe yield calculations.

Because of the technical and complex nature of some aquifer recharge, storage and recovery projects, FEMA may request additional information to determine/demonstrate technical feasibility and cost-effectiveness and to complete required EHP reviews.

B.13.2.7. Budget

All subapplications must include a line-item breakdown of all anticipated costs.

Subapplicants may apply for subrecipient management costs to cover administrative costs. Management costs must be included in the subapplication budget as a separate line item. More information about the requirements for management cost requests can be found in Part 13.

B.13.2.8. Schedule

A detailed schedule must be provided for all tasks identified in the project cost estimate and scope of work. The schedule must identify major milestones, with start and end dates for each activity. Project schedules must show completion of all activities including the construction period within the period of performance. Sufficient detail must be provided to document that the project can be completed within the period of performance.

B.13.2.9. Costs

Typical costs for an aquifer recharge, storage and recovery project may include but are not limited to:

- Engineering and design services and cost estimate preparation.
- Data analysis/investigations directly related to the mitigation project, including geotechnical investigations, engineering reports, and hydrologic and hydraulic analyses.
- Construction management.
- Surveying and inspection.
- Water quality sampling.
- Permitting and/or legal fees.
- All construction activities and materials required for project completion.
- Disconnecting and reconnecting utilities and extending lines and pipes as necessary.
- Complying with local utility requirements.
- Debris disposal and erosion control.
- Costs for repair of lawns, landscaping, sidewalks or driveways, if damaged by the project.

B.13.3. AQUIFER RECHARGE, STORAGE AND RECOVERY: SUBAWARD IMPLEMENTATION

The following are the basic steps in implementing an approved HMA aquifer recharge, storage and recovery project:

1. Pre-construction (acquire land, if applicable; carry out design process; seek technical consultant; prepare cost estimate; obtain construction permits; hire construction manager/contractor).
2. Clear/prepare site and install erosion control measures to prepare for construction activities.
3. Complete excavation, drilling, foundation work and grading.
4. Construct project.
5. Relocate/restore utility lines.
6. Complete inspections.

Post-award monitoring helps ensure subrecipients are achieving the objectives of the federal award consistent with the performance goals and milestones described in the subaward. To assist the recipient in monitoring aquifer recharge, storage and recovery projects, the following milestone information or events should be included in Quarterly Progress Reports:

- If the subrecipient is acquiring contract support, the subrecipient should report when the request for proposal is completed, when the contract is out for bid, when the bid period closes, when proposals are reviewed, when the contractor is selected, and the date of the kickoff meeting.
- Describe the current status including a summary of:
  - Recent progress and planned work.
  - Risks identified or changes from the milestones/deliverables submitted with the scope of work (e.g., financial concerns, coordination issues with state or local governments and utilities, project management or contracting issues, legal disputes, and significant changes impacting construction activities or timelines such as delays due to weather, materials, procurement or labor issues).
  - When construction has started, is substantially complete or completed.
- If property is purchased, the report should provide property address, purchase price and date.
- Any other milestones that have been identified in the subapplication, agreed to or are required by the recipient.

B.13.3.1. Budget and Scope of Work Change

All budget and scope changes must have prior FEMA approval consistent with Part 8. Construction design activities are defined as construction activities; therefore, budget changes involving them must be consistent with Part 8.F.2.

Because the final design may not be completed prior to award, once the project is awarded, the design must be finalized by a licensed professional engineer. If the scope of work or cost estimate changes because of completing the final design or to address permitting requirements, prior approval from FEMA is required.

B.13.4. AQUIFER RECHARGE, STORAGE AND RECOVERY: CLOSEOUT

Recipients and subrecipients must closeout projects in a timely manner consistent with Part 9.

Upon completing an aquifer recharge, storage and recovery project, the authority having jurisdiction over the project must submit to the recipient a final verification assurance that the HMA aquifer recharge, storage and recovery project was constructed as designed and in accordance with the approved scope of work. This documentation is included as project closeout documentation and must confirm that the aquifer recharge, storage and recovery project provides the designed level of protection.

Closeout of aquifer recharge, storage and recovery projects includes the submittal of an operations and maintenance plan to FEMA for review prior to subaward closeout. In the plan, the recipient must confirm the plan is consistent with the HMA Guide, meets or exceed local codes, and is in conformance with appropriate permits. At a minimum, the operations and maintenance plan must include the following information:

- Information demonstrating the completed project will be maintained to achieve the proposed hazard mitigation.
- A description of the post-closeout maintenance activities that will be completed to maintain the project area.
- The period of time the community is committing to maintaining the area and/or project site, which must be consistent with the project useful life in the BCA.
- The department and job position that will be responsible for the project after construction has ended. Estimated costs for annual maintenance of the project.
- The schedule for completion of the maintenance activities.

B.13.5. AQUIFER RECHARGE, STORAGE AND RECOVERY: RESOURCES

Aquifer Recharge, Storage and Recovery Resources

- FEMA BCA: https://www.fema.gov/grants/guidance-tools/benefit-cost-analysis
- FEMA EHP review job aids: https://www.fema.gov/grants/guidance-tools/environmental-historic/preparation-resources
- The National Integrated Drought Information System U.S. Drought Portal: http://www.drought.gov/drought
- The U.S. Drought Monitor: http://droughtmonitor.unl.edu/
- NASA Gravity Recovery and Climate Experiment: http://www.nasa.gov/mission_pages/Grace
- U.S. Global Change Research Program: http://www.globalchange.gov
- NOAA Climate.gov: https://www.climate.gov
- Policy Clarification: *BCA Tools for Drought, Ecosystem Services, and Post-Wildfire Mitigation for HMA*: https://www.fema.gov/media-library-data/1464899521902-b2d31bbf89cc089c3cd43851a33d4aee/PolicyClarification_BCA(Drought-EcosystemServices-Wildfire)_508.pdf

C. Other Innovative Solutions

FEMA may provide assistance for other innovative solutions not specifically outlined in the HMA Guide under HMGP, HMGP Post Fire, BRIC and FMA. These proposed activities will be evaluated on their own merit against program requirements that generally include:

- Eligibility and completeness.
- Cost-effectiveness.
- Technical feasibility and effectiveness.
- EHP program compliance.

Eligible projects will be approved on a case-by-case basis, provided assistance is available.

C.1. Other Innovative Solutions: Application and Submission Information

All subapplications submitted to FEMA must meet the eligibility criteria in Part 4. All subapplications must have a scoping narrative in accordance with Part 6.

FEMA may request additional information after the subapplication has been submitted to ensure all necessary information is received. However, all information required by the regulations and the HMA Guide must be received before an assistance decision and award or final approval can be made.

Part 13. Management Costs

The Federal Emergency Management Agency (FEMA) provides assistance for management costs incurred in the administration of Hazard Mitigation Assistance (HMA) awards and subawards.

A. Eligibility

Management costs are available under HMGP, HMGP Post Fire, BRIC and FMA.

For the Hazard Mitigation Grant Program (HMGP) and Hazard Mitigation Grant Program Post Fire (HMGP Post Fire), recipients will be reimbursed no more than 15% of the total amount of the award, of which not more than 10% may be used by the recipient and 5% by the subrecipient. Under HMGP and HMGP Post Fire, recipients' Administrative Plans must include procedures for monitoring and reporting on subrecipient management costs before receiving funding for management costs. For more information, refer to Part 10.

For Building Resilient Infrastructure and Communities (BRIC) and Flood Mitigation Assistance (FMA), recipients may apply for a maximum of 10% of the total funds requested in their application cost estimate (federal and non-federal shares) for management costs to support the subapplications included as part of their award. Subapplicants for BRIC and FMA may apply for a maximum of 5% of the total funds requested in a subapplication for management costs. For more information, refer to Part 10.

Additional management costs considerations may be found in the Notices of Funding Opportunity (NOFOs). If any requirements in the HMA Guide conflict with the NOFO, the requirements in the NOFO take precedence.

A.1. Eligible Activities

Administrative costs are expenses incurred by a recipient or a subrecipient in applying for, managing and administering the federal award to ensure federal, state or tribal requirements are met.

Management costs may include, but are not limited to:

- Recipient:
  - Delivery of technical assistance, including environmental and historic preservation and mitigation planning activities.
  - Delivery of mitigation planning or mitigation-related grants management training.
  - Solicitation, development, review and processing of subapplications.

- Subapplication development and technical assistance to subapplicants regarding feasibility and effectiveness and benefit-cost analysis.
- Review and processing of mitigation plans for approval.
- Post-award real property monitoring and coordination of disposition requests, including open space compatibility verification.
- Program and grants management activities outlined in Program Administration by States agreement.

- Subrecipient:
  - Development and processing of subapplications.
- Both recipient and subrecipient:
  - Quarterly Progress Reports and financial reporting.
  - Project monitoring.
  - Technical monitoring (such as site visits and technical meetings).
  - Compliance activities associated with federal procurement requirements.
  - Documentation of quality of work verification for Quarterly Progress Reports and closeout.
  - Payment of claims.
  - Closeout review, reporting and liquidation.
  - Records retention.
  - Purchase or rental of equipment and per diem and travel expenses directly related to the implementation of HMA programs. These costs must support management cost activities.
  - Professional development of state, local or tribal government staff that is directly related to the implementation of HMA programs.
  - Personnel costs directly related to performing the activities listed above.
  - Indirect costs. Examples include:
    - Depreciation or use allowances on buildings and equipment.
    - Costs of operating and maintaining facilities.

- General administration and general expenses.
- Personnel and accounting administration.

A.1.1. PERSONNEL TIME ELIGIBLE UNDER MANAGEMENT COSTS

Personnel costs can be eligible for management costs if the employee or contractor is undertaking activities related to the receipt and administration of HMA programs.

There is no universal rule for classifying certain costs as either direct or indirect (facilities and administrative) under every accounting system. A cost may be direct with respect to some specific service or function, but indirect with respect to the federal award or other final cost objective. Therefore, it is essential that each item of cost incurred for the same purpose be treated consistently in like circumstances either as a direct or an indirect facilities and administrative cost to avoid possible double charging of federal awards.[493]

A.2. Ineligible Activities

Any activities directly related to a project are not eligible under management costs. For example, architectural, engineering and design services are project costs and cannot be included under management costs.

Construction management activities that manage, coordinate and supervise the construction process from project scoping to project completion are project costs. These activities cannot be included under management costs.

Indirect costs are only eligible as management costs and cannot be included as costs in the activity/project cost estimate.

B. Application and Submission Information

Management costs are not automatically provided or calculated and recipients/subrecipients must include management costs in their subapplications.

All recipients and subrecipients must apply for management costs before the HMGP or HMGP Post Fire application deadline. If a recipient or subrecipient does not apply for management costs by the application deadline, management costs will no longer be available for the remainder of the project.

Recipients must submit a separate management costs subapplication within their award package. The subapplication for recipient management costs must be included in the overall award application or the request will not be considered.

[493] 2 Code of Federal Regulations (CFR) § 200.412

Subapplicants may apply for management costs by including them in their subapplication budget as a separate line item.

A separate management costs narrative (activity description, schedule, cost estimate and budget narrative) must be provided in the electronic application system to apply for management costs.

The documentation must include:

- A description of activities, personnel requirements and other costs for which the recipient/subrecipient will use management cost assistance provided under this part.
- The recipient/subrecipient's plan for expending and monitoring the assistance provided under this part and ensuring sufficient assistance is budgeted for award and subaward closeout.

For BRIC and FMA, recipients may apply for management costs in accordance with the instructions and requirements of the NOFO.

For HMGP and HMGP Post Fire, subapplicants who are requesting management costs must apply through their recipient. All subapplications submitted to FEMA must meet the eligibility criteria in Part 4. All subapplications must have a scoping narrative in accordance with Part 6.

B.1. Declining Management Costs

Subrecipients are not required to apply for management costs. For HMGP and HMGP Post Fire, the recipient's hazard mitigation officer or designated representative should document procedures in the Administrative Plan to address a subrecipient's decision not to apply.

B.2. Activity and Schedule

For the applicant management cost subapplication, the scope of work narrative describes the activities and specific tasks related to the entire grant cycle, from soliciting and developing subapplications to closing out the subapplication/award and audits. The narrative describes personnel requirements for the proposed activities and indicates whether contract support or consultants will be used.

For subrecipient management costs, subapplicants must provide a budget narrative within their project budgets. The narrative must describe the activities, tasks and personnel being supported with management costs funding.

B.3. Allowable Costs

FEMA only reimburses for actual, allowable costs, and the recipient or subrecipient must properly document all charges.

B.3.1. UNALLOWABLE COSTS

Subapplicants who are not awarded subawards for activities will not receive reimbursement for pre-award costs incurred in developing and submitting subapplications.

Salaries and other operational costs covered by other federal assistance such as Emergency Management Program Grants are not eligible.

B.3.2. BUDGET

All subapplications must include a line-item breakdown of all anticipated costs (cost estimate) and a budget narrative. A budget narrative must support the budget so FEMA can determine that costs are allocable, necessary and reasonable. The budget describes costs for which the recipient/subrecipient will use management costs assistance. The budget narrative provides information on how the assistance will be expended and monitored and shows that enough assistance will be available for closeout.

Typically, a budget for management costs will include the following cost categories, if applicable:

- **Personnel (labor) and fringe**: Provide the number of personnel, number of hours per quarter, average pay rate and fringe benefit rates.
- **Travel**: Provide a breakdown of travel costs: the type of transportation, lodging, mileage and per diem rates, and estimated description of travel needs. The budget narrative should describe the travel involved and its purpose and explain how the proposed travel is necessary for the project. If travel details are unknown, the basis for proposed costs should be explained. Lump sums will not be accepted.
- **Equipment**: Include a list of equipment and the intended use of the equipment. Provide a lease versus purchase analysis with each item with a value of more than $5,000. Provide a copy of rental agreement(s) and pricing.[494]
- **Supplies/materials**: A unit cost estimate for each major component or element.
- **Contractual**: The estimate should be supported by a method of selection (competitive, sole source with justification, sealed bids, small purchase or micro-purchase), request for proposal/scope of work, period of performance, criteria for measuring accountability, bid documents or contract. If bids have not been received, the recipient/subrecipient may submit an independent cost estimate.
- **Other**: Include information in narrative on how costs were identified.

[494] 2 CFR § 200.439

- **Pre-award**: To be eligible for assistance, all pre-award costs must be noted in a separate line item including the date the cost was incurred and a narrative description of the task completed.[495]

- **Indirect costs**: Indirect costs are only eligible as management costs.

B.3.3. OBLIGATION

Subrecipient management costs will be approved when the subaward is awarded. FEMA may obligate management costs in increments as noted below. Subrecipients will only receive management costs in conjunction with a subaward.

For HMGP and HMGP Post Fire, FEMA may advance management costs to recipients in the first year, prior to establishing the HMGP ceiling amount or HMGP Post Fire available assistance amount. Refer to Part 10 for more information about applying for management cost funds based on the 30-day and six-month estimates. Regardless of when subawards are obligated, if the total amount of the award is adjusted for any reason, FEMA will de-obligate management costs that exceed the 15% cap (10% for the recipient and 5% for the subrecipient) based on updated calculations.

B.3.3.1. Strategic Funds Management and Incremental Obligation

All subapplications, including management costs greater than $1 million federal share, must be reviewed to determine whether the subaward is a candidate for strategic funds management. All recipient management cost awards greater than $1 million and all subrecipient management costs awarded in conjunction with subawards greater than $1 million will follow strategic funds management. As part of the strategic funds management review, FEMA will evaluate the need for incremental obligation of management costs. Additionally, all recipient management costs subawards between $500,000 and $1 million and all subrecipient management costs awarded in conjunction with subawards between $500,000 and $1 million will be subject to incremental obligation.

For subawards subject to incremental obligation, recipient and subrecipient management costs will be obligated in increments sufficient to cover recipient and subrecipient needs for no more than one year unless contractual agreements require additional assistance. Table 36 explains how obligations will be handled by the size of the total subaward (federal share and required non-federal share).

[495] 2 CFR § 200.458

Table 36: Obligation Information by Total Award Amount

Total Award Amount	Obligation Time Frame
Recipient Management Costs for Subaward	
Greater than $1 million	Recipient management costs for subawards greater than $1 million will follow FEMA's strategic funds management process. The annual obligation cycle and will follow the strategic funds management procedures. FEMA, the recipient and the subrecipient will review the budget and work schedule to ensure the project supports incremental obligation. FEMA will execute obligations in increments, based on the project meeting an established project milestone schedule, until the project is completed.
$500,000–$1 million	Recipient management costs for subawards between $500,000 and $1 million will be obligated by FEMA in increments sufficient to cover recipient and subrecipient needs for no more than one year unless contractual agreements require additional assistance. The increment amount will be determined based upon the applicant's budget and schedule. The number of increments will be determined by the length of period of performance (one increment per year).
Less than $500,000	Recipient management costs for subawards under $500,000 can be fully obligated at the time of award except for closeout withholding.
Subrecipient Management Costs	
Greater than $1 million (management costs equal to or more than $50,000)	Subrecipient subawards greater than $1 million (or management costs equal to or more than $50,000) will follow FEMA's strategic funds management procedures. FEMA, the recipient and the subrecipient will review the budget and work schedule to ensure the project supports incremental obligation. FEMA will execute obligations in increments, based on the project meeting an established project milestone schedule, until the project is completed.
$500,000–$1,00,000 (management costs between $25,000 and $50,000)	Subrecipient subawards between $500,000 and $1 million (or management costs between $25,000 and $50,000) will be obligated by FEMA in increments sufficient to cover recipient and subrecipient needs for no more than one year unless contractual agreements require additional assistance. Amount of increments are determined based on applicant's management costs budget and schedule.
Less than $500,000 (management costs under $25,000)	Subrecipient subawards under $500,000 (or management costs under $25,000) can be fully obligated by FEMA at the time of award.

B.3.3.1.1. Annual Increment

When incremental obligation is required, the recipient and the subrecipient should review their management costs schedule, budget and narrative to determine when the assistance will be needed. The recipient and subrecipient must develop their management costs financial plan by budget (or fiscal) year and include a roll-up of all budget years projected to submit to FEMA for review and approval. This requirement ensures the recipient and subrecipients adequately plan for expending management costs through the lifecycle of the award and ensures there is enough assistance through closeout.

After the recipient has reviewed current progress and determined that the next increment of assistance is needed, the recipient must request assistance from FEMA using the budget amendment procedures. FEMA reviews the recipient's request, and if the recipient/subrecipient is ready to expend additional assistance, they will obligate the next increment of assistance. This incremental change is generally done on an annual basis, although exceptions can be made when justified.

B.4. Subaward Implementation

B.4.1. PROGRAM REPORTING AND MONITORING

Quarterly financial reporting is required for recipient and subrecipient management costs. Quarterly financial reporting and data analysis is the process of receiving and analyzing financial information reported by the recipient and subrecipient to gauge progress and compliance with award requirements and to gain reasonable assurance that assistance does not exceed the allowable or approved amounts. FEMA analyzes the data for the recipient. The recipient analyzes data for the subrecipient.

B.4.2. BUDGET AND SCOPE OF WORK CHANGE

Additional management costs cannot be applied for after the application deadline. If management costs are approved prior to the end of the application period, they can be amended as needed, using the budget and scope of work change procedures in Part 8.

Recipients are required to report deviations from budget, project scope or objectives in accordance with Part 8. Recipients must request prior approvals from FEMA for budget and program plan revisions.[496]

Prior approval from FEMA is needed to amend a subaward and move project costs to management costs if management costs were obligated prior to the application deadline. A recipient/subrecipient may request a budget change if it is consistent with the program guidelines and regulations. If the subrecipient reduces or moves funds from a project budget to a management costs budget, the

[496] 2 CFR § 200.308

amount of assistance available for management costs will also be reduced. The subrecipient cannot request more than 5% of the total amount of the subaward.

If management costs are approved prior to the end of the application period, they can be amended as needed, using the budget and scope of work change procedures in Part 8.

B.5. Closeout

FEMA will adjust recipient management costs awards to ensure that the amount available for management costs does not exceed the percentage permitted by each program. If the total amount of the grant award is adjusted for any reason, FEMA will de-obligate management costs that exceed allowed amounts. FEMA will adjust subrecipient management cost awards to ensure that available amounts do not exceed the percentage permitted for each program, including approved budget changes or underruns at closeout.

For HMGP, recipient management costs are available for actual documented expenses up to 10% of the total amount of the grant award. The total amount of the grant award means the total amount of contributions based on subapplications submitted when the HMGP application period closes or when the total HMGP ceiling is determined, whichever is later. For HMGP, subrecipients may claim actual documented management costs up to 5% of the actual subaward, inclusive of budget changes.

B.5.1. CLOSEOUT WITHHOLDING

For HMGP and HMGP Post Fire, FEMA will withhold 3% of the recipient management costs award until closeout to ensure timely management costs closeout. For recipients with an enhanced mitigation plan and who also have a Program Administration by States designation, FEMA will reduce the withholding to 2% of the recipient management costs award. FEMA will provide the withheld assistance after the recipient closes the last non-management cost subaward. The withholding does not apply to the subrecipient's management costs award, only the recipient's award.

B.5.2. AVAILABILITY OF MANAGEMENT COSTS

For HMGP and HMGP Post Fire, the subrecipient can claim management costs incurred within the subaward period of performance. For HMGP and HMGP Post Fire, the recipient can claim management costs incurred within the award period of performance. Refer to the relevant fiscal year's NOFO for information regarding the availability of management costs for BRIC and FMA.

The recipient may submit an extension request if additional time is needed to complete management cost activities. The recipient must provide a request that includes the following information:

- Description of management costs work performed by recipient personnel and or contract support.

- A cost estimate for the remainder of the award period of performance. The cost estimate must identify costs by budget year (recipient fiscal year or federal fiscal year). The cost estimate must also describe personnel costs by position and number of labor hours anticipated for the activity or general category of activities. The cost categories to include are:
  - Salaries (with overtime).
  - Fringe benefits.
  - Operating expenses.
  - Contracts.
  - One-time expenditures.
  - Equipment.
  - Vehicles.
  - Equipment purchased/leased and the anticipated disposal method.
- A scope of work and project schedule for remaining period of performance that includes a staffing organizational chart identifying the responsibilities of each position.
- A copy of scope of work for any contracts used to support recipient management costs activities.
- A copy of the Administrative Plan. The plan must be updated to include Quarterly Progress Reports procedures so FEMA can adequately measure progress and the plan of action for closing the award and metrics for the number of projects to be closed per year.
- Accurate current quarterly financial and progress reports.

FEMA analyzes if costs have been incurred outside of the period of performance date and if the Quarterly Progress Report is accurate at the time of the extension request. FEMA may deny a period of performance extension request if payments have been made outside of the period of performance or if the quarterly financial and progress reports are not accurate.

Part 14. Program Administration by States

A. Program Administration by States Background and Overview

Section 404(c) of the Robert T. Stafford Disaster Relief and Emergency Assistance Act (Stafford Act) authorized the Federal Emergency Management Agency (FEMA) to implement the Program Administration by States (PAS) as a pilot program before developing a rule permanently implementing PAS.[497]

Under the PAS Pilot, FEMA may delegate defined program responsibilities to recipients based on an analysis of recipients' staffing plan, grants management experience, hazard mitigation experience and demonstrated past performance.[498] For example, generally, FEMA reviews and approves all HMGP subapplications and hazard mitigation plans. Under the PAS Pilot, FEMA may grant the recipient authority to conduct agreed upon reviews and grant approvals with limited FEMA oversight. Additionally, under the PAS Pilot, the recipient can have increased control of approval of scope of work changes, cost overruns and underruns, reimbursement claims to subrecipient communities, and approval of local mitigation plans. While FEMA has a reduced role under PAS, it maintains oversight responsibilities. The PAS Pilot is intended to facilitate and accelerate the review and approval process of various elements in managing the program.

Participation in PAS is optional. The optional PAS Pilot applies to HMGP for eligible activities immediately following any major disaster declaration on or after Jan. 29, 2013.

Federally recognized tribes that choose to be a recipient may request PAS delegations. In this part, unless otherwise indicated, the term recipient will refer to states, federally recognized tribes and territories that receive HMGP and HMGP Post Fire assistance directly from FEMA.

B. State, Tribal or Territorial PAS Request

A recipient wishing to participate in PAS must submit a written request to FEMA indicating their desire to implement PAS. As part of the written request for PAS, the recipient may elect to assume primary responsibility for some or all elements of HMGP and HMGP Post Fire or can request grant administration delegations from FEMA.

[497] 42 United States Code (U.S.C.) § 5170c(c)
[498] 42 U.S.C. § 5170c(c)(2)

The responsibilities that FEMA may delegate include but are not limited to reviewing the project and planning applications, completing Benefit-Cost Analyses (BCAs) for projects, approving scope of work modifications and moving assistance between applicable projects. Recipients can also approve local mitigation plans under PAS. FEMA staff will assess the recipient's request against the criteria provided in Part 14, Section Y. PAS Delegated Activity Categories.

B.1. PAS: Disaster Delegation

Recipients can request PAS at any time, including before submitting applications, during the application period and even post-award for a declaration.

Recipients who are interested in the delegation of grants management activities should contact their regional Hazard Mitigation Assistance (HMA) representative prior to submitting a request letter to the FEMA regional office.

B.2. PAS: Non-Disaster Delegation of Local Mitigation Plan Approval

A state without disaster declarations can request that FEMA delegates the review of local hazard mitigation plans to the recipient.[499] Because federally recognized tribes do not review local mitigation plans, they cannot request that FEMA delegates to them the review of local mitigation plan approval.

C. PAS Criteria

To establish eligibility for administering PAS, the requesting recipient must have: [500]

- A current FEMA-approved state or tribal (standard or enhanced) mitigation plan.
- Demonstrated past performance in the grant management area(s).
- Demonstrated commitment to mitigation.

D. PAS FEMA Assessment

After discussing its interest in PAS with the FEMA regional office, the recipient must submit a request letter to its FEMA regional administrator. The request letter will indicate the activities the recipient is interested in managing and will contain the supporting documentation demonstrating the recipient can manage HMGP and HMGP Post Fire and the recipient's commitment to mitigation.

Upon receipt of the recipient's PAS request letter and supporting documentation, the FEMA regional HMA program staff and mitigation planning program staff (if the recipient requests non-disaster

[499] 44 Code of Federal Regulations (CFR) § 201.3(c)(6)
[500] Section 404(c) of the Stafford Act, 42 U.S.C. § 5170c(c)

delegation of local mitigation plan approval, when applicable) must review the request within 30 calendar days. FEMA will assess the recipient's request against the criteria provided in Part 14.Y.

If FEMA determines the recipient meets the criteria, the agency will contact the recipient to begin drafting an operational agreement. FEMA may request additional information or documentation from the recipient if the information is lacking. If the request is denied, FEMA will notify the recipient with a letter explaining why the request was denied and procedures for reconsideration.

E. PAS Operational Agreement

FEMA will develop an operational agreement (as part of the FEMA-State or FEMA-Tribal Agreement) with approved PAS recipients that outlines agreed-upon delegations. The operational agreement must outline applicability, FEMA and recipient responsibilities, and the process for suspending or terminating the program if FEMA determines the recipient is not administering HMGP or HMGP Post Fire or mitigation planning activities in a satisfactory manner.

E.1. PAS: Disaster Delegation

Because this is a pilot program, the operational agreements will be tied to HMGP and HMGP Post Fire awards except for the non-disaster delegation of local mitigation plan approval, to which FEMA and the recipient may agree without an HMGP or HMGP Post Fire award. Assigning PAS designations to HMGP and HMGP Post Fire awards will allow recipients to build capability over time. FEMA uses the PAS Pilot to consult with recipients to establish criteria for approval of an application to administer HMGP and HMGP Post Fire and develop program regulations to implement the PAS program.

Updated operational agreements will be developed for each declared disaster for which a recipient requests delegation of some HMGP and HMGP Post Fire administration elements. Recipients with multiple open disasters may have separate operational agreements for each disaster and may request different activities for each disaster. Operational agreements expire when the HMGP and HMGP Post Fire period of performance ends.

E.2. PAS: Non-Disaster Delegation of Local Mitigation Plan Approval

Assigning PAS designations outside of HMGP and HMGP Post Fire awards for local mitigation plan approval will encourage states to build capability and partnerships that will support risk reduction efforts by establishing priorities for implementing mitigation strategies using a wide range of resources, including HMGP and HMGP Post Fire. It will also allow states that approve local mitigation plans under a disaster agreement to continue local mitigation plan approvals once the disaster agreement has ended.

Non-disaster agreements for approval of local mitigation plans are limited to five years. If a disaster declaration is received, the state must transition into a disaster agreement. When a state is considering transitioning from a disaster to non-disaster or non-disaster to disaster agreement,

FEMA may use the amendment process provided for in the agreement instead of requiring the state to submit a new or updated PAS request. The state's mitigation planning performance must be in good standing to transition to another type of agreement. If FEMA and the state cannot settle upon a transition between a non-disaster and disaster agreement within a reasonable time frame, FEMA will terminate the agreement.

F. PAS Update to HMGP and HMGP Post Fire Administrative Plan

If approved for the PAS Pilot under the disaster delegation, the recipient must update its HMGP or HMGP Post Fire Administrative Plan.[501] HMGP/HMGP Post Fire Administrative Plans must outline those components the recipient will administer under PAS, in accordance with the HMA Guide.

F.1. PAS: Disaster Delegation

The recipient must update its HMGP or HMGP Post Fire Administrative Plan by preparing a PAS addendum that provides a procedural guide that details how the recipient will administer delegated activities. FEMA must review and approve this plan.

F.2. PAS: Non-Disaster Delegation of Local Mitigation Plan Approval

The state should develop a management plan or procedural guide that details how the state will administer the delegated activity of local mitigation plan approval. FEMA must review and approve this management plan or procedural guide.

G. PAS Delegation Options

Recipients participating in the PAS Pilot may opt to do many of the same activities they currently perform. Final review and approval by FEMA will not be required in most cases.

G.1. PAS: Application Review

Recipients will review and approve HMGP and HMGP Post Fire subapplicant applications and pre-award amendment requests using FEMA's expedited application approval process for obligating assistance.

Recipients using the expedited application approval process must submit the complete subapplication and the following:

[501] 44 CFR § 206.437

- Minimum Eligibility Criteria Checklist or equivalent documentation. Refer to Appendix Part 16.D and Appendix Part 16.E.
- Management costs.
- A project summary consisting of the following:
  - Major disaster declaration number from which mitigation funds will be obligated by FEMA.
  - Project number (FEMA will provide to recipient).
  - Subapplicant name(s) (i.e., community and point of contact information, National Flood Insurance Program status).
  - Congressional District (senators and representatives).
  - Federal Information Processing Standard code (FEMA will provide to recipient).
  - Unique Entity Identifier local or tribal mitigation plan information.
  - Brief description of the project.
  - Project location with global positioning system coordinates and flood zone.
  - Flood insurance policy information, if applicable.
  - Total project cost.
  - Amount requested (federal share).
  - Non-federal cost share amount and source (e.g., local, global credit pool).
  - Cost-effectiveness determination.
  - Proposed performance period (completion date).
  - List of alternatives considered (e.g., acquisition, elevation, drainage upgrade).
  - Reviews/results.
  - Certification that the recipient has reviewed and determined this project is eligible.
    - All documentation needed for the project environmental review and all coordinating agency consultation letters and memorandums.
    - Benefit-cost summary sheet.

- Project site map, including FEMA flood map data.
- Assurances.

Once FEMA receives these items, FEMA will begin the process to award assistance.

For the subapplications reviewed, recipients can approve the assistance of pre-award planning and project costs incurred by subrecipients.

G.2. PAS: Benefit-Cost Analysis

Recipients participating in PAS may review and approve a subrecipient's BCAs without FEMA review. Recipients prepare their own BCAs without FEMA review.

G.3. PAS: Grants Management

Recipients may approve post-award subrecipient scope of work modifications (that have no change to the project activity and no resulting need for additional federal assistance) after FEMA EHP regional clearance. If there are modifications to the scope of work, reference the procedures in Part 8.

The recipient will submit a Minimum Eligibility Criteria Checklist or equivalent documentation and a project summary. Recipients may develop and use their own checklists if approved by FEMA. For mitigation projects, refer to Appendix Part 16.D, and for mitigation planning activities, refer to Appendix Part 16.E. Recipients will update Quarterly Progress Reports accordingly.

Recipients will approve time limit extensions for subapplications with no impact to the recipient's HMGP or HMGP Post Fire award period of performance. Recipients will document these changes in Quarterly Progress Reports and electronic data systems.

Recipients will administer HMGP and HMGP Post Fire for specific project types submitted by the subrecipient, including property acquisition and structure demolition, wildfire mitigation, safe rooms, structural elevation or other eligible hazard mitigation project types.

G.4. PAS: Fiscal Management

Without prior approval from FEMA, recipients will approve post-award budget revisions using assistance available due to cost underruns from other approved subawards. This assistance can be moved to approved subawards with cost overruns. Assistance can only be used within the same HMGP or HMGP Post Fire award.

Prior to its approval, the recipient must determine if the project meets eligibility requirements, including cost-effectiveness and cost share. The recipient will update project files with an updated eligibility checklist for project/planning subapplications or equivalent documentation. Recipients may develop and use their own checklists if approved by FEMA. The recipient will update and submit the

project summary using electronic data systems provided by FEMA and will update Quarterly Progress Reports accordingly.

Recipients will determine the eligible amount of reimbursement for each subrecipient claim and process payment without FEMA's approval.

G.5. PAS: Mitigation Planning

States participating in PAS must approve local mitigation plans using the process described in the HMA Guide and coordinate with the appropriate FEMA regional mitigation planning lead monthly regarding FEMA's updates to mitigation plan status database.

FEMA will continue to send final approval letters in accordance with the *Local Mitigation Planning Policy Guide* (released April 19, 2022; effective April 19, 2023).[502] When tribes participate in multi-jurisdictional plans with local governments, FEMA will also review the plan for compliance with tribal mitigation plan requirements and the *Tribal Mitigation Plan Review Guide* (Dec. 2017) and send final approval letters to tribes.[503]

H. Environmental Review Under PAS

For purposes of the PAS Pilot, FEMA will not delegate the environmental and historic preservation (EHP) review of HMGP and HMGP Post Fire subapplicant applications and pre-award amendments and subrecipient post-award amendments to the recipients. The statutory provision for the PAS Pilot does not provide sufficient authority to delegate EHP review to recipients for compliance with HMGP and HMGP Post Fire eligibility and EHP requirements. FEMA has final review and approval authority on the EHP impact of any proposed federal action or undertaking. However, recipients may assist FEMA with EHP review preparation (refer to Part 3.I). Activities that assist FEMA with the preparation of the EHP review include completing project scope, describing the proposed activity and providing background information for assessing the environmental impact of the federal action on historic properties, threatened and endangered species, critical habitats, wetlands, floodplains and low-income and minority populations. Recipients should work with their subapplicants/subrecipients to evaluate and document environmental and cultural resource information involved with the proposed HMGP and HMGP Post Fire projects to consider alternatives to avoid, minimize and/or mitigate potential adverse impacts to the human environment and to integrate sustainable practices as early as possible in project formulation.

Before approving any subapplicant applications, pre-award amendments or subrecipient post-award amendments, recipients must coordinate with FEMA regional EHP staff to receive EHP clearance for approving HMGP and HMGP Post Fire subapplications and pre-award amendments and post-award amendments. HMGP and HMGP Post Fire assistance cannot be obligated until FEMA has completed

[502] The *Local Mitigation Plan Review Guide* (Oct. 1, 2011) is in effect until April 18, 2023.
[503] 44 CFR § 201.7

the EHP review process. The Minimum Eligibility Criteria Checklist or equivalent documentation and the project summary that recipients agree to submit will provide the FEMA regional EHP staff with the information needed to complete EHP review in most cases. Recipients will be required to submit to FEMA regional EHP staff any additional information or documentation needed for FEMA to complete the review. Recipients must coordinate with the subapplicant/subrecipient to obtain additional information.

I. State Approval of Local Mitigation Plans Under PAS

Typically, a national panel comprised of FEMA headquarters and regional mitigation planning staff reviews the state's initial request for delegation of local mitigation plan review approval.

After review of the request is completed and FEMA determines the state's past performance is adequate, FEMA mitigation planners and the state will conduct a joint review of local mitigation plans. The intent is to ensure a common understanding of the process and that procedures related to local mitigation plan review and approval are completed in accordance with the *Local Mitigation Planning Policy Guide*.[504] There are several sections of the Local Mitigation Plan Review Tool (Appendix A of the *Local Mitigation Planning Policy Guide*), such as the Plan Assessment, that are completed by FEMA and will have to be completed by the state.

The joint reviews are intended to provide technical assistance in completing these sections. The length of the joint review period will be negotiated between FEMA and the state. The joint reviews are intended for the first plans approved under the agreement or may involve reviewing past plans when new plan submissions are not available.

If states request delegation of local mitigation plan approvals, they are expected to complete the following activities:

- States will review and approve local mitigation plans within 45 calendar days of receipt, whenever possible.
- States will notify FEMA when a local mitigation plan is adopted and approved and provide the following items to FEMA:
    - Copy of the local mitigation plan.
    - Copy of the completed Local Mitigation Plan Review Tool.
    - Copies of the adoption resolutions or documentation.

[504] The *Local Mitigation Planning Policy Guide* will be effective April 19, 2023, for all plan approvals. The *Local Mitigation Plan Review Guide* is in effect until April 18, 2023, for all plan approvals.

- State's approval notification.
- Local jurisdiction's contact information.

- States will be required to send monthly updates to the FEMA regional mitigation planning office, describing plan approval status, the status of plan reviews, technical assistance activities and scheduled training. States will also update the Mitigation Planning Portal if delegated permission from the FEMA regional mitigation planning office.

FEMA will continue to send final approval letters in accordance with the *Local Mitigation Planning Policy Guide*.

I.1. PAS: Disaster Delegation

States can request delegation of local mitigation plan approval under a HMGP or HMGP Post Fire award issued as part of a disaster declaration.

I.2. PAS: Non-Disaster Delegation

States can request delegation of local mitigation plan approval when there is no open disaster declaration.

J. PAS Performance Monitoring

FEMA will perform monitoring visits and provide tools and training as needed. FEMA's monitoring program will vary depending on the size and scope of the HMGP or HMGP Post Fire award and the activities delegated to the recipient. As stated in the agreement, FEMA staff will conduct an overall review to determine if processes agreed to in the agreement and Administrative Plans or management plans are being followed. Monitoring visits will occur at least once a year. After the monitoring visit is complete, FEMA will provide the recipient with a monitoring report and will work with the recipient to resolve any issues.

J.1. PAS: Disaster Delegation Grants Management Activities

Ongoing monitoring activities will be centered around the quarterly reporting periods. FEMA regional offices will evaluate the recipient's performance quarterly by reviewing award application data, quarterly or monthly reports, fiscal management processes, staffing allocations, key personnel changes and subaward procedures and processing. Annually, or as needed, FEMA will also conduct more in-depth monitoring activities either on-site or through desk reviews.

Monitoring visits will most likely coincide with grants management activity. For example, if FEMA has delegated the application review to the recipient, FEMA might conduct a review at the halfway point of the application period to ensure compliance. Review frequency can be addressed during the drafting of the agreement.

During a second-level review (desk review or site visit), FEMA will review project files for documentation compliance. For those recipients requesting delegation of fiscal activities, FEMA will review the recipient's audit report and use the fiscal testing system to follow up on concerns identified in the audit. As part of monitoring activities, FEMA regional staff may also interview recipient staff working on HMGP and HMGP Post Fire as part of the PAS Pilot (and subrecipients as needed) to learn how the program is being managed from their perspective.

Using FEMA's questions from a data collection plan for evaluation of the PAS Pilot, the agency will interview subrecipients to collect data to evaluate the effectiveness of the PAS Pilot.

J.2. PAS: Disaster and Non-Disaster Delegation of Local Mitigation Plan Approval

Ongoing monitoring activities will be centered on the monthly updates provided to the FEMA regional mitigation planner, who will evaluate the state's performance by reviewing plan status data, technical assistance activities and any changes in key personnel.

If FEMA delegates the local mitigation plan approval to the recipient, FEMA regional mitigation planning staff will conduct monitoring activities and make determinations regarding compliance. FEMA will conduct at least one plan review audit per year.

K. Non-Compliance Under PAS

Recipients will be expected to continue to maintain performance as agreed to in the agreement and Administrative Plan or the management plan for the non-disaster option for review of local mitigation plans. Recipients will maintain the performance levels under which they were evaluated for PAS status. If FEMA finds significant declines in performance, the agency will provide the recipient information regarding the consequences for non-compliance, including the circumstances in which PAS status can be revoked. For more information on non-compliance and actions to address deficiencies, refer to Part 8.

L. Revocation of PAS Status

FEMA will discuss with the recipient any findings from monitoring that may require remediation. The recipient must provide a plan and timeline to address the findings within 30 calendar days of notice from the region. If the corrective measures are not implemented or cannot be implemented within a reasonable time frame, FEMA will notify the recipient of the options available, including possible revocation of the PAS status. For more information on non-compliance and actions to address deficiencies, refer to Part 8.

M. Subapplicant or Subrecipient Appeal Under PAS

The HMGP and HMGP Post Fire appeal process will not change under PAS. FEMA will continue to review appeals from subapplicants and subrecipients regarding eligibility of activities or costs.[505]

N. Financial Statement Audits Under PAS

For purposes of the PAS Pilot, FEMA will not delegate the environmental and historic preservation (EHP) review of HMGP and HMGP Post Fire subapplicant applications and pre-award amendments and subrecipient post-award amendments to the recipients. The statutory provision for the PAS Pilot does not provide sufficient authority to delegate EHP review to recipients for compliance with HMGP and HMGP Post Fire eligibility and EHP requirements. FEMA has final review and approval authority on the EHP impact of any proposed federal action or undertaking. However, recipients may assist FEMA with EHP review preparation (see refer to Part 3.I). Activities that assist FEMA with the preparation of the EHP review include completing project scope, describing the proposed activity and providing background information for assessing the environmental impact of the federal action on historic properties, threatened and endangered species, critical habitats, wetlands, floodplains and low-income and minority populations. Recipients should work with their subapplicants/subrecipients to evaluate and document environmental and cultural resource information involved with the proposed HMGP and HMGP Post Fire projects to consider alternatives to avoid, minimize and/or mitigate potential adverse impacts to the human environment and to integrate sustainable practices as early as possible in project formulation.

Before approving any subapplicant applications, pre-award amendments or subrecipient post-award amendments, recipients must coordinate with FEMA regional EHP staff to receive EHP clearance for approving HMGP and HMGP Post Fire subapplications and pre-award amendments and post-award amendments. HMGP and HMGP Post Fire assistance cannot be obligated until FEMA has completed the EHP review process. The Minimum Eligibility Criteria Checklist or equivalent documentation and the project summary that recipients agree to submit will provide the FEMA regional EHP staff with the information needed to complete EHP review in most cases. Recipients will be required to submit to FEMA regional EHP staff any additional information or documentation needed for FEMA to complete the review. Recipients must coordinate with the subapplicant/subrecipient to obtain additional information.

O. State Approval of Local Mitigation Plans Under PAS

Typically, a national panel comprised of FEMA headquarters and regional mitigation planning staff reviews the state's initial request for delegation of local mitigation plan review approval.

After review of the request is completed and FEMA determines the state's past performance is adequate, FEMA mitigation planners and the state will conduct a joint review of local mitigation

[505] 44 CFR § 206.440

plans. The intent is to ensure a common understanding of the process and that procedures related to local mitigation plan review and approval are completed in accordance with the *Local Mitigation Planning Policy Guide*.[506] There are several sections of the Local Mitigation Plan Review Tool (Appendix A of the *Local Mitigation Planning Policy Guide*), such as the Plan Assessment, that are completed by FEMA and will have to be completed by the state.

The joint reviews are intended to provide technical assistance in completing these sections. The length of the joint review period will be negotiated between FEMA and the state. The joint reviews are intended for the first plans approved under the agreement or may involve reviewing past plans when new plan submissions are not available.

If states request delegation of local mitigation plan approvals, they are expected to complete the following activities:

- States will review and approve local mitigation plans within 45 calendar days of receipt, whenever possible.
- States will notify FEMA when a local mitigation plan is adopted and approved and provide the following items to FEMA:
  - Copy of the local mitigation plan.
  - Copy of the completed Local Mitigation Plan Review Tool.
  - Copies of the adoption resolutions or documentation.
  - State's approval notification.
  - Local jurisdiction's contact information.
- States will be required to send monthly updates to the FEMA regional mitigation planning office, describing plan approval status, the status of plan reviews, technical assistance activities and scheduled training. States will also update the Mitigation Planning Portal if delegated permission from the FEMA regional mitigation planning office.

FEMA will continue to send final approval letters in accordance with the *Local Mitigation Planning Policy Guide*.

[506] The *Local Mitigation Planning Policy Guide* will be effective April 19, 2023, for all plan approvals. The *Local Mitigation Plan Review Guide* is in effect until April 18, 2023, for all plan approvals.

O.1. PAS: Disaster Delegation

States can request delegation of local mitigation plan approval under a HMGP or HMGP Post Fire award issued as part of a disaster declaration.

O.2. PAS: Non-Disaster Delegation

States can request delegation of local mitigation plan approval when there is no open disaster declaration.

P. PAS Performance Monitoring

FEMA will perform monitoring visits and provide tools and training as needed. FEMA's monitoring program will vary depending on the size and scope of the HMGP or HMGP Post Fire award and the activities delegated to the recipient. As stated in the agreement, FEMA staff will conduct an overall review to determine if processes agreed to in the agreement and Administrative Plans or management plans are being followed. Monitoring visits will occur at least once a year. After the monitoring visit is complete, FEMA will provide the recipient with a monitoring report and will work with the recipient to resolve any issues.

P.1. PAS: Disaster Delegation Grants Management Activities

Ongoing monitoring activities will be centered around the quarterly reporting periods. FEMA regional offices will evaluate the recipient's performance quarterly by reviewing award application data, quarterly or monthly reports, fiscal management processes, staffing allocations, key personnel changes and subaward procedures and processing. Annually, or as needed, FEMA will also conduct more in-depth monitoring activities either on-site or through desk reviews.

Monitoring visits will most likely coincide with grants management activity. For example, if FEMA has delegated the application review to the recipient, FEMA might conduct a review at the halfway point of the application period to ensure compliance. Review frequency can be addressed during the drafting of the agreement.

During a second-level review (desk review or site visit), FEMA will review project files for documentation compliance. For those recipients requesting delegation of fiscal activities, FEMA will review the recipient's audit report and use the fiscal testing system to follow up on concerns identified in the audit. As part of monitoring activities, FEMA regional staff may also interview recipient staff working on HMGP and HMGP Post Fire as part of the PAS Pilot (and subrecipients as needed) to learn how the program is being managed from their perspective.

Using FEMA's questions from a data collection plan for evaluation of the PAS Pilot, the agency will interview subrecipients to collect data to evaluate the effectiveness of the PAS Pilot.

P.2. PAS: Disaster and Non-Disaster Delegation of Local Mitigation Plan Approval

Ongoing monitoring activities will be centered on the monthly updates provided to the FEMA regional mitigation planner, who will evaluate the state's performance by reviewing plan status data, technical assistance activities and any changes in key personnel.

If FEMA delegates the local mitigation plan approval to the recipient, FEMA regional mitigation planning staff will conduct monitoring activities and make determinations regarding compliance. FEMA will conduct at least one plan review audit per year.

Q. Non-Compliance Under PAS

Recipients will be expected to continue to maintain performance as agreed to in the agreement and Administrative Plan or the management plan for the non-disaster option for review of local mitigation plans. Recipients will maintain the performance levels under which they were evaluated for PAS status. If FEMA finds significant declines in performance, the agency will provide the recipient information regarding the consequences for non-compliance, including the circumstances in which PAS status can be revoked. For more information on non-compliance and actions to address deficiencies, refer to Part 8.

R. Revocation of PAS Status

FEMA will discuss with the recipient any findings from monitoring that may require remediation. The recipient must provide a plan and timeline to address the findings within 30 calendar days of notice from the region. If the corrective measures are not implemented or cannot be implemented within a reasonable time frame, FEMA will notify the recipient of the options available, including possible revocation of the PAS status. For more information on non-compliance and actions to address deficiencies, refer to Part 8.

S. Subapplicant or Subrecipient Appeal Under PAS

The HMGP and HMGP Post Fire appeal process will not change under PAS. FEMA will continue to review appeals from subapplicants and subrecipients regarding eligibility of activities or costs.[507]

T. Financial Statement Audits Under PAS

Recipients are responsible for obtaining annual audits in accordance with 2 Code of Federal Regulations (CFR) Part 200. The financial audit determines if the recipient's financial documentation and processes are consistent with generally accepted accounting principles. These audits will help

[507] 44 CFR § 206.440

FEMA determine whether HMGP and HMGP Post Fire assistance is spent in accordance with program regulations and this PAS Pilot guidance.

For recipients with HMA awards, annual audits are required regardless of where the recipient is in the grant management process.

U. Program Audits Under PAS

Program audits are an impartial review of program documents to provide an independent assessment of the performance of HMGP and HMGP Post Fire.

Because PAS is a pilot program, FEMA anticipates that a program audit may be completed to determine the effectiveness of the PAS Pilot. The information in the audit will be used to help improve the provision of assistance under HMGP and HMGP Post Fire and report on program performance. FEMA and the Department of Homeland Security, Office of the Inspector General will continue to conduct program audits of HMGP and HMGP Post Fire.

V. PAS and High-Risk Recipients

States, federally recognized tribes or territories classified as high-risk recipients cannot participate in or request PAS delegation because FEMA has determined the recipient has a documented history of unsatisfactory performance. High-risk recipients receive additional project monitoring and require additional FEMA approvals to conduct award activities.

W. PAS Roles and Responsibilities

The PAS Pilot is administered through a coordinated effort between FEMA and the recipient. While both entities must work together to meet the overall objective of streamlined program delivery, each has a different role.

FEMA will:

- Provide an application process for PAS privileges as well as evaluation criteria.
- Provide appropriate guidance on requirements of any delegated responsibilities noted in the Administrative Plan.
- Receive and approve the Administrative Plan or management plan for non-disaster option for review of local mitigation plans.
- Monitor recipient performance by reviewing Quarterly Progress Reports and or monthly planning reports.

- Monitor recipient performance through periodic evaluations to ensure PAS activities comply with program requirements.
- Continue to manage and coordinate funding with recipient in accordance with HMGP Disaster Spend Plan (refer to Part 10.A.12), strategic funds management and Large Project Notification (refer to Part 7.B.2) requirements.
- Conduct EHP reviews.

Recipients must:

- Incorporate PAS delegated functions into the Administrative Plan or management plan for non-disaster option for approval of local mitigation plans.
- Formulate hazard mitigation objectives based on the strategy in the FEMA-approved mitigation plan and any more recent information or data.
- Decide how to distribute assistance based on priorities established by the mitigation planning process.
- Adhere to all applicable HMGP and HMGP Post Fire statutes and regulations, including current guidance regarding HMGP/HMGP Post Fire administration.
- Meet all specified timelines.
- Maintain a continuing capacity to manage HMGP and HMGP Post Fire.
- Continue to manage and coordinate funding with FEMA in accordance with HMGP Disaster Spend Plan, strategic funds management, and Large Project Notification requirements.
- Retain documentation for FEMA quarterly audit reviews.

X. PAS Evaluation

To determine the PAS Pilot's effectiveness, a review team composed of recipient and FEMA representatives will conduct an evaluation. For recipients that participate, an evaluation will be conducted six years after the program starts. This evaluation will be different from the monitoring and auditing activities and will focus on the program rather than recipient performance. This team will evaluate the level of success of the PAS Pilot based on the previously identified program evaluation criteria, identify PAS Pilot components that worked well and make recommendations for any needed improvements or changes.

Performance metrics used to evaluate the PAS Pilot include measuring if recipient-administered programs are more efficient than traditionally run programs. Specifically, metrics will be used to evaluate if the program increased or decreased costs to administer HMGP and HMGP Post Fire,

expedited or delayed obligations and project completions, and contributed to the overall effectiveness of the program.

Y. PAS Delegated Activity Categories

The following sections address each delegated activity category. These sections provide a measurement item and/or target to document past performance for the specified delegated activity type. Recipients must meet the required measurement for PAS approval. In reviewing recipient requests for PAS participation, FEMA will only assess delegated activities requested by the recipient.

Y.1. PAS: Time Frame for Past Performance

In general, FEMA will review the past performance of the last four quarters submitted to the agency prior to receiving the recipient request. FEMA may extend this time frame when insufficient data are available; these extensions will be noted when needed. For recipients updating their PAS status for a new disaster declaration, FEMA will use the last four quarterly reports submitted prior to the disaster declaration.

Y.2. PAS: Data Needed in Recipient Request Letter

The amounts and types of data needed to support the recipient's request will vary based on the types of delegated activities selected. Recommended data elements are noted in each table and the list following them. Recipients may submit other data they determine may be necessary to support their request. FEMA will supplement its review of the request with grants management data for the recipient.

Y.2.1. PAS: APPLICATION REVIEW

Step 1: Review and approve HMGP and HMGP Post Fire subapplications and pre-award amendment requests using FEMA's expedited application approval process for obligating assistance. Recipients can select one or all the following:

- Project subapplicants (all projects or selected projects).
- Planning subapplications.
- Management costs.

Note: If a recipient chooses a subset of project types, FEMA will only evaluate related subapplications. For example, FEMA would only review structural elevation subapplications when the recipient requests delegated review limited to structural elevation subapplications.

Step 2: Approve finding of pre-award planning and project costs incurred by subrecipients.

The following list highlights the data needed to demonstrate past performance of application review when requesting delegation of application review activities (Steps 1 and 2 above) along with the measurable target(s) associated with each item:

- **Administrative plan**: List of declared disasters, HMGP and HMGP Post Fire awards and plan approval dates. The Administrative Plan is approved by FEMA within 90 calendar days of the declaration date.

- **Electronic data systems**: List of subapplications and document applications that were submitted electronically. All applications are entered into FEMA's electronic application systems.

- **Application eligibility and completeness**: List of subapplications and amendments for HMGP, HMGP Post Fire, Building Resilient Infrastructure and Communities (BRIC) and Flood Mitigation Assistance (FMA); date the application was submitted by the recipient; date approved by FEMA; and notation of whether the eligibility checklist or equivalent documentation was provided to FEMA.

    - A complete eligibility checklist for planning or project subapplications or equivalent documentation is prepared for all subapplications. Recipients may develop and use their own checklists if approved by FEMA and the recipient.

    - All subapplications are determined to be complete by FEMA within 90 calendar days of submittal or selection for further review. Required EHP reviews and consultations will not be included in the 90-day time frame calculation.

- **Grant application extensions**: List of HMGP, HMGP Post Fire, BRIC, FMA and Pre-Disaster Mitigation (PDM) awards; application deadline date, if applicable; and date the request of extension was requested, if applicable. Any request to extend the HMGP or HMGP Post Fire application period was submitted at least 30 calendar days prior to the end of the expiration of the application period.

- **Training**: Staffing organizational chart or roster and a summary listing of training completed within the past five years as provided by recipient's hazard mitigation officer, designated representative or training officer.

    - Staff managing application development under PAS have completed FEMA Emergency Management Institute E0212: *Unified Hazard Mitigation Assistance: Developing Quality Application Elements Course* and other HMA–related courses.

    - Staff managing application development under PAS have completed FEMA Emergency Management Institute IS-253.A *Overview of FEMA's Environmental and Historic Preservation Review* course.

Y.2.2. PAS: BENEFIT-COST ANALYSES

Step 1: Review and approve BCA submitted by subrecipients without FEMA review.

Step 2: Prepare own BCA without FEMA review.

The following list highlights the data needed to demonstrate past performance of BCAs when requesting delegation of BCA activities (Steps 1 and 2 above) along with the measurable target(s) associated with each item:

- **BCA**: List of subapplications (HMGP, HMGP Post Fire, BRIC, PDM and FMA), date BCA submitted, date reviewed and accepted as correct by FEMA. All applications are determined to be completed by FEMA within 90 calendar days of submittal or selection for further review, including all data requested by FEMA to support cost-effectiveness determinations. Required EHP review and consultations will not be included in the 90-day review time frame calculation.

- **Training**: Staffing organizational chart or listing and a summary listing of training completed within the past five years as provided by the hazard mitigation officer (or designated representative) or training officer.

    - Recipient staff who will prepare or review BCAs under PAS Agreement have completed a FEMA BCA course (IS-276.A, *Benefit-Cost Analysis Fundamentals* or its equivalent). Staff should complete modules for project types or hazards anticipated. Completion of all modules is not required.

    - Recipient staff who have prepared BCA documentation have completed course E0212 or its equivalent.

Y.2.3. PAS: GRANTS MANAGEMENT

Step 1: Approve post-award subrecipient scope of work modifications (that have no change to the project activity and no resulting need for additional federal assistance) without FEMA review. Submit an updated Minimum Eligibility Criteria Checklist or equivalent documentation and project summary via electronic data systems provided by FEMA. Recipients may develop and use their own checklists if approved by FEMA. Update Quarterly Progress Reports accordingly.

Step 2: Approve time limit extensions for subawards with no impact to the HMGP and HMGP Post Fire award period of performance. Document these changes in Quarterly Progress Report and electronic data systems.

Step 3: Administer HMGP and HMGP Post Fire for specific project types submitted by the subrecipient, including property acquisition and structure demolition, wildfire mitigation, safe rooms, structural elevation or other eligible hazard mitigation project type.

The following list highlights the data needed to demonstrate past performance of grants management when requesting delegation of grants management activities (steps 1, 2 and 3 above) along with the measurable target(s) associated with each item:

- **Grant extensions**: List of HMGP, HMGP Post Fire, BRIC, PDM and FMA awards and period of performance deadlines. Date of extension requests, if applicable. All work as part of HMA subawards must be completed by the end of the period of performance as described in the HMA Guide. All extension requests must be complete, on time and with adequate justification as described in guidance.

- **Recipient progress reports**: Dates progress reports were submitted to FEMA for all HMA awards. Documentation of extension approvals, if applicable. All progress reports must be complete and submitted on time. Information in the reports must accurately describe grant activities, including data related to the completion of individual property acquisitions. Incomplete progress reports that do not provide information on all open awards and subawards or include all information required by the HMA Guide are not considered on time.

- **Subaward closeout activities**: Listing of all HMGP, HMGP Post Fire, BRIC, PDM and FMA subawards that were closed out by the recipient. Hazard mitigation officer certifies subawards were closed out within 90 calendar days from the end of the period of performance. Because these data are found in recipient files, FEMA will review findings from FEMA monitoring and closeout reports.

    - All subaward closeout activities, including financial reconciliation, are completed within 90 calendar days from the end of the period of performance.

    - Actual expenditures have been documented and are consistent with Standard Form (SF) 424A, *Budget Information for Non-Construction Programs*, or SF-424C, *Budget Information for Construction Programs*.[508]

- **Award closeout**: Dates documents were submitted to FEMA. Period of performance deadlines for respective HMGP, HMGP Post Fire, BRIC, PDM and FMA awards.[509]

    - Complete SF-425: *Federal Financial Report* and progress reports were submitted within 120 calendar days from the end of the period of performance.

    - Statement submitted that approved scope of work and all EHP requirements have been satisfied.

[508] Forms can be found on the grants.gov "SF-424 Family" webpage.
[509] Forms can be found on the grants.gov "Post-Award Reporting Forms" webpage.

- SF-270: *Request for Advance or Reimbursement* or request to de-obligate assistance is completed, if applicable because of cost underruns.
- No late drawdowns were requested or performed after the liquidation period ended.

Y.2.4. PAS: FISCAL MANAGEMENT

Step 1: Without prior approval from FEMA, approve post-award budget changes using assistance available because of cost underruns from other approved subawards. This assistance can be moved to approved subawards with cost overruns. Assistance can only be used within the same HMGP or HMGP Post Fire award.

Step 2: Prior to approval, determine whether the project meets eligibility requirements, including cost-effectiveness and cost share. Submit an updated Minimum Eligibility Criteria Checklist or equivalent documentation and project summary via electronic data systems provided by FEMA. Update Quarterly Progress Reports accordingly. Recipients may develop and use their own checklists if approved by FEMA.

Step 3: Determine the eligible amount of reimbursement for each subaward claim and process payment without approval from FEMA.

The following list highlights the data needed to demonstrate past performance of fiscal management when requesting delegation of fiscal management activities (Steps 1, 2 and 3 above) along with the measurable target(s) associated with each item:

- **SF-425 prepared by recipient**: Dates SF-425 was submitted to FEMA. Documentation of extension approvals, if applicable. All federal financial reports are submitted on time. Information in reports projects an accurate picture of grant activities.
- **Recipient financial management systems**: Narrative describing financial management. Recipient consistently complies with the financial management standard requirements described in 2 CFR §§ 200.300 - 309.
- **Recipient financial statement audit**: Date of last audit; summary of findings for HMA programs, if applicable; narrative on how recipient addressed findings, if applicable. No major findings on last single audit obtained by the recipient related to HMA programs. For recipients without HMA awards, FEMA will review other federal grants prepared by the responsible agency (i.e., state, tribal or territorial emergency management agency).
- **Closeout activities**: Date closeout documentation was submitted to FEMA. Period of performance deadline for respective HMA awards.
    - All award closeout activities, including financial reconciliation are completed within 120 calendar days from the end of the period of performance, including:

- Final SF-425 and Quarterly Progress Reports were submitted within 120 calendar days from the end date of the period of performance.
- Statement that scope of work(s) has been completed as approved and all EHP requirements have been satisfied.
- SF-270 (or request to de-obligate assistance is completed, if applicable because of cost underruns) was submitted on time.
- Other documentation as required in the HMA Guide.
- No drawdowns requested or performed after the liquidation period has ended.

Y.2.5. PAS: MITIGATION PLANNING (DISASTER AND NON-DISASTER AGREEMENTS)

Step 1: Approve local mitigation plans using the process described below; FEMA will send final approval letters in accordance with the *Local Mitigation Planning Policy Guide*. FEMA will continue to send final approval letters to tribal communities when included in a multi-jurisdictional plan.

A national panel composed of FEMA headquarters and regional mitigation planning staff will review the state's initial request for delegation of local mitigation plan approval. The following list highlights the data needed to demonstrate past performance of mitigation planning when requesting delegation of mitigation planning activities (Step 1 above) along with the measurable target(s) associated with each item:

- **Plans are approvable pending adoption**: List of local mitigation plans submitted to FEMA, noting which plans were approvable pending adoption (no required revisions). All local mitigation plan reviews are approvable pending adoption (no required revisions) following their initial review by FEMA. If fewer than six plans have been submitted within the last four quarters, the six most recent plan reviews will be used to make this determination.
- **Mitigation planning training**: Staffing organizational chart or listing and a summary listing of staff who have completed training within the past five years as provided by the hazard mitigation officer (or designated representative) or training officer. A summary of staff experience or education can be provided to document equivalent experience. Staff who will be performing or managing local mitigation plan review under the PAS Pilot have completed E-318/G-318, *Local Hazard Mitigation Planning*; IS-318, *Mitigation Planning for Local and Tribal Communities*; and IS-328, *Plan Review for Local Mitigation Plans* or their equivalents as approved by the FEMA National Mitigation Planning Program.
- **Guidance and regulations**: Staffing organizational chart or listing and summary of staff experience as documented by the hazard mitigation officer (or designated representative) or manager of mitigation planning review. States document that staff dedicated to mitigation planning understand and have experience interpreting and implementing mitigation planning guidance and 44 CFR Part 201 mitigation planning regulations.

- **Administration of mitigation planning activities**: Mitigation planning regulations include standards for managing states, where mitigation planning regulations refer to Section 404(c) of the Stafford Act for provisions for PAS.[510] Under this pilot, states will be required to address these standards. Provide narrative as needed.

  - Resources: The state has documented the funding used to develop local mitigation plans, including HMA.[511]

  - Staff: The state has documented the capacity and capability of the mitigation planning staff to adequately provide consistent plan review, satisfactorily determine plans are approved pending adoption and provide technical assistance.

  - Technical assistance and training program: The state has documented the process used to (1) conduct plan review and provide technical assistance and training to local planners and (2) build local mitigation capability.[512]

  - Administration: The state has documented how it will conduct local mitigation plan reviews within the 45-day review period and will, whenever possible, provide a copy of the plan and a monthly status report to FEMA that includes plan approval status, status of plan reviews, technical assistance activities and training scheduled.[513]

Y.2.6. PAS: COMMITMENT TO MITIGATION

The review of Commitment to Mitigation has two parts. The first part addresses the recipient's ability to manage the HMGP, HMGP Post Fire and Mitigation Planning programs. The second part addresses the recipient's ability to support mitigation practices and activities statewide.

Y.2.6.1. PAS: Disaster Declaration - Grants Management Experience

In the request letter, a recipient should provide information to support that they:

- Staff HMGP and HMGP Post Fire such that there are in-house or contract staff responsible for all elements, including delegated activities throughout the HMGP and HMGP Post Fire award lifecycles.

- Manage HMGP and HMGP Post Fire resources so they can conduct the standard and delegated activities throughout the HMGP and HMGP Post Fire award cycles.

[510] 42 U.S.C. § 5170c(c)
[511] 44 CFR § 201.4(c)(4)
[512] 44 CFR § 201.3(c)(5)
[513] 44 CFR § 201.6(d)(4)

- Provide technical assistance to communities and eligible subapplicants such that they are then able to perform the function for which they requested assistance.
- Use an effective management plan to administer HMGP, HMGP Post Fire and Mitigation Planning such that post-disaster mitigation activities derive from mitigation planning, and that these activities are executed in a systematic, organized fashion that ensures compliance with HMGP and HMGP Post Fire requirements and regulations.

Y.2.6.2. PAS: Approval of Local Mitigation Plans - Mitigation Planning Experience to Support HMGP/HMGP Post Fire

In the request letter, a recipient should provide information to support that they:

- Staff the Mitigation Planning program such that there are in-house or contract staff to adequately provide training, technical assistance, and plan review and approvals.
- Manage HMA program resources so they can provide assistance to develop and update local mitigation plans.
- Provide training and technical assistance to communities and eligible subapplicants such that they are then able to develop an approvable local mitigation plan.
- Use an effective management plan to administer Mitigation Planning programs to identify long-term, broadly supported strategies for risk reduction and identify implementation approaches for future HMGP/HMGP Post Fire awards.

Y.2.6.3. PAS: Mitigation Practices and Activities

In the request letter, a recipient should indicate whether they have a standard or enhanced mitigation plan and provide the date the plan was approved by FEMA.

Recipients with a standard mitigation plan must provide information that describes an existing comprehensive mitigation program that might include but is not limited to examples listed in the mitigation planning regulation 44 CFR § 201.5(b)(4). A “comprehensive mitigation program” means a broad range of recipient-supported initiatives and activities that:

- Target risk reduction for each of the identified hazards in the recipient’s plan.
- Are inclusive of various governmental agencies and sectors with mitigation capabilities and resources.
- Are coordinated to increase the state, tribe or territory’s resilience from the adverse impacts of future hazard events.

Initiatives and activities that demonstrate commitment include but are not limited to a combination of current training, partnerships, leadership initiatives, assistance, technical assistance, codes and ordinances, or other activities that reduce risk.

Part 15. FEMA Contacts

If requested, the Federal Emergency Management Agency (FEMA) will provide training and technical assistance to both applicants and subapplicants (by way of their applicants) regarding:

- General questions about FEMA's programs, including the HMA programs; mitigation planning; and Risk Mapping, Assessment and Planning.
- Feasibility and effectiveness, cost-effectiveness and environmental and historic preservation compliance during the application period.
- The electronic application system processes.

FEMA encourages applicants and subapplicants (by way of their applicants) to seek technical assistance early in the application period by contacting their appropriate FEMA regional office. Table 37 shows which states and territories each FEMA region serves.

Table 37: FEMA Regions

FEMA Region	Serving
1	Connecticut, Maine, Massachusetts, New Hampshire, Rhode Island and Vermont
2	New Jersey, New York, Puerto Rico and U.S. Virgin Islands
3	Delaware, District of Columbia, Maryland, Pennsylvania, Virginia and West Virginia
4	Alabama, Florida, Georgia, Kentucky, Mississippi, North Carolina, South Carolina and Tennessee
5	Illinois, Indiana, Michigan, Minnesota, Ohio and Wisconsin
6	Arkansas, Louisiana, New Mexico, Oklahoma and Texas
7	Iowa, Kansas, Missouri and Nebraska
8	Colorado, Montana, North Dakota, South Dakota, Utah and Wyoming
9	Arizona, California, Hawaii, Nevada, Guam, American Samoa, Commonwealth of Northern Mariana Islands, Republic of Marshall Islands and Federated States of Micronesia
10	Alaska, Idaho, Oregon and Washington

Contact Information Resources

- FEMA regional offices: https://www.fema.gov/about/organization/regions
- State and territorial hazard mitigation officers: https://www.fema.gov/grants/mitigation/state-contacts
- New information regarding external tribal liaisons: https://www.fema.gov/about/organization/tribes

Part 16. Appendices

A. Acronyms

ADA	Americans with Disabilities Act
ASCE	American Society of Civil Engineers
BCA	Benefit-Cost Analysis
BCR	Benefit-Cost Ratio
BRIC	Building Resilient Infrastructure and Communities
CATEX	Categorical Exclusion
CBRS	Coastal Barrier Resources System
CFR	Code of Federal Regulations
CRS	Community Rating System
EHP	Environmental and Historic Preservation
EO	Executive Order
FAPIIS	Federal Awardee Performance and Integrity Information System
FEMA	Federal Emergency Management Agency
FEMA GO	FEMA Grants Outcomes
FIRM	Flood Insurance Rate Map
FMA	Flood Mitigation Assistance
FMAG	Fire Management Assistance Grant
HHPD	High Hazard Potential Dam
HMA	Hazard Mitigation Assistance
HMA Guide	Hazard Mitigation Assistance Program and Policy Guide
HMGP	Hazard Mitigation Grant Program

HMGP Post Fire	Hazard Mitigation Grant Program Post Fire
IA	Individual Assistance
IBC	International Building Code
ICC	International Code Council
IEBC	International Existing Building Code
LANDFIRE	Landscape Fire and Resource Management Planning Tools
MCER	Risk-Targeted Maximum Considered Earthquake
MPH	miles per hour
NASA	National Aeronautics and Space Administration
NFIP	National Flood Insurance Program
NFPA	National Fire Protection Association
NOAA	National Oceanic and Atmospheric Administration
NOFO	Notice of Funding Opportunity
OCFO	Office of the Chief Financial Officer
OMB	Office of Management and Budget
PA	Public Assistance
PARS	Payment and Reporting System
PAS	Program Administration by States
PDM	Pre-Disaster Mitigation
PR&G	Principles, Requirements and Guidelines for Federal Investments in Water Resources
Risk MAP	Risk Mapping, Assessment and Planning
RFI	Request for Information
S_1	1.0 Second
SEI	Structural Engineering Institute

SF	Standard Form
SFHA	Special Flood Hazard Area
S_S	0.2 Second
Stafford Act	Robert T. Stafford Disaster Relief and Emergency Assistance Act
TB	Technical Bulletin
URA	Uniform Relocation Assistance and Real Property Acquisition Policies Act
USACE	U.S. Army Corps of Engineers
U.S.C.	United States Code

B. Glossary

All terms not listed below are used consistent with the term definitions used in Title 44 of the CFR unless otherwise specified.

Administrative actions: Grants management requirements to close out an award or subaward including conducting final inspections for projects, validating expenditures, resolving negative audit findings, obtaining and preparing final reports, and completing closeout activities.

Adverse impact/adverse effect: In general terms related to EHP laws, a negative impact (e.g., loss, destruction, modification) to an environmental or historic resource that can have a direct, indirect or cumulative effect on that resource. Impacts or effects may be short-term or long-term in duration.

Applicant: The entity, such as a state, federally recognized tribe or territory applying to FEMA for a federal award that will be accountable for the use of the funds. Once funds are awarded, the applicant becomes the recipient or pass-through entity or both.

Approved mitigation plan: A plan developed to guide mitigation investments and meets the requirements set forth for state, local or tribal mitigation plans in 44 CFR Part 201: *Mitigation Planning*, including formal adoption by the state or governing body, as well as meets requirements set forth by applicable state, local or tribal mitigation planning policies.

Approximate Zone A: An area subject to inundation by the 1% annual chance flood event. Because detailed hydraulic analyses have not been performed, no Base Flood Elevations or flood depths are shown.

Authority having jurisdiction: A term defined used by the Internal Code Council consensus standard for safe rooms to mean the organization, political subdivision, office or individual charged with the responsibility for administering and enforcing the provisions of this standard.

Automatic Disconnecting Means (ADM): Mechanism, such as a multimode inverter or microgrid interconnect device, that allows the system to isolate from the grid and operate in island mode.

Award: A grant of financial assistance for a specified purpose by the federal government to an eligible recipient.

Base flood: A flood having a 1% chance of being equaled or exceeded in any given year.

Base flood elevation: The elevation shown on the FIRM for Zones AE, AH, A1–A30, AR, AR/A, AR/AE, AR/A1–A30, AR/AH, AR/AO, V1–V30 and VE that indicates the water surface elevation resulting from a flood that has a 1% chance of equaling or exceeding that level in any given year.

Benefit-Cost Analysis (BCA): A quantitative procedure that assesses the cost-effectiveness of a hazard mitigation measure by taking a long-term view of avoided future damage compared to the cost of a project.

Benefit-Cost Ratio (BCR): A numerical expression of the cost-effectiveness of a project calculated as the net present value of total project benefits divided by the net present value of total project costs.

Biomass: Biological material derived from living or recently living organisms.

Building: A structure with two or more outside rigid walls and a fully secured roof that is affixed to a permanent site; a manufactured home or a mobile home without wheels, built on a chassis and affixed to a permanent foundation, that is regulated under the community's floodplain management and building ordinances or laws. "Building" does not mean a gas or liquid storage tank or a recreational vehicle, park trailer or other similar vehicle.

Clean-site certification: A letter from the appropriate federal, state, local, federally recognized tribal or territorial entity determining that no further remedial action is required to protect human health or the environment.

Climate adaptation: Adjustments that reduce risk from climate change today and continue to reduce risks in the future.[514]

Climate resilience: Ability to adapt to changing conditions, as well as withstand and rapidly recover from disruption due to disasters, emergencies and extreme weather events with minimum damage to social well-being, the economy and the environment.[515]

Coastal Barrier Resources Act (CBRA): This Act, passed in 1982 and amended in 1990, aims to remove the federal incentive to allow for development within coastal barrier areas within the United States, Puerto Rico and the U.S. Virgin Islands, as well as preserve the ecological integrity of areas that serve as storm buffers. The Act designates Coastal Barrier Resources System units and makes these areas ineligible for most federal expenditures and financial assistance, including federal flood insurance; the law does provide for funding exceptions within Section 6. The law also designates Otherwise Protected Areas for which only flood insurance is prohibited.

Coastal Barrier Resources System (CBRS): A geographic unit designated to serve as a protective barrier against forces of wind and tidal action caused by coastal storms and serving as habitat for aquatic species. Congress restricted federal spending and assistance for development-related activities within CBRS units to protect them from further development. Flood insurance is unavailable in these areas unless exceptions of Section 6 of the Coastal Barrier Resources Act apply. CBRS units are identified on FEMA FIRMs.

Coastal high hazard area: An area of special flood hazard extending from offshore to the inland limit of a primary frontal dune along an open coast and any other area subject to high-velocity wave action from storms or seismic sources.

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[514] Definition based on U.S. Global Change Research Program.
[515] Ibid.

Combustible material: Any material that, in the form in which it is used and under the conditions anticipated, will ignite and burn or will add appreciable heat to an ambient fire.

Community Rating System (CRS): A program developed by FEMA to provide incentives for those communities in the NFIP that have gone beyond the minimum floodplain management requirements to develop extra measures to provide protection from flooding.

Community resilience: The ability to prepare for anticipated hazards, adapt to changing conditions, and withstand and recover rapidly from disruptions. Activities such as disaster preparedness (prevention, protection, mitigation, response and recovery) are key steps to resilience.

Cost-effectiveness: Determined by a systematic quantitative method for comparing the costs of alternative means of achieving the same stream of benefits for a given objective. The benefits in the context of hazard mitigation are avoided future damage and losses. Cost-effectiveness is determined by performing a BCA.

Critical action: An action for which even a slight chance of flooding is too great. The minimum floodplain of concern for critical actions is the 0.2% annual chance floodplain (i.e., critical action floodplain). Critical actions include but are not limited to those that create or extend the useful life of structures or facilities. The following are some examples:

- Those which produce, use or store highly volatile, flammable, explosive, toxic or water-reactive materials.
- Hospitals, nursing homes and housing for the elderly, which are likely to contain occupants who may not be sufficiently mobile to avoid the loss of life or injury during flood and storm events.
- Emergency operation centers or data storage centers, which contain records or services that may become lost or inoperative during flood and storm events.
- Generating plants and other principal points of utility lines.

Critical facilities: Structures and institutions necessary, in the community's opinion, for response to and recovery from emergencies. Critical facilities must continue to operate during and following a disaster to reduce the severity of impacts and accelerate recovery. These would include, but not be limited to:

- Structures or facilities that produce, use or store highly volatile, flammable, explosive, toxic and/or chemically reactive materials.
- Hospitals, nursing homes and housing likely to have occupants who may not be sufficiently mobile to avoid injury or death during an emergency.

- Police stations, fire stations, vehicle and equipment storage facilities, and emergency operations centers that are needed for emergency response activities before, during and after the event.
- Public and private utility facilities vital to maintaining or restoring normal services to affected areas before, during and after the event.
- Other structures or facilities the community identifies as meeting the general criteria above.

This definition is for HMA program use and clarification and is not meant to provide a definition for use under other programs or supersede any FEMA regulation.

Defensible space: An area that is either natural or manmade, where material capable of allowing a fire to spread unchecked has been treated, cleared or modified to slow the rate and intensity of an advancing wildfire and to create an area for fire suppression operations to occur.

Direct costs: Costs that can be identified specifically with a particular final cost objective, such as a federal award or cost that can be linked to a specific project.

Disabilities: Circumstances that are met for providing physical, programmatic and effective communication access to the whole community by accommodating individual requirements through accessibility and/or specific modifications. Disabilities include assistance, accommodation or modification for mobility, communication, transportation, safety and health maintenance; and assistance, accommodation or modification because of any situation (temporary or permanent) that limits an individual's ability to act in an emergency.

Discount rate: The interest rate used in calculating the present value of expected yearly benefits and costs. For FEMA-funded projects, the rate is set by Office of Management and Budget.

Distribution panel: Distribution panel or equipment that the output of the inverter will be connected to.

Distributed energy resource: Small, modular, energy-generation and storage technology that provides electric capacity or energy where needed. Examples of distributed energy resources include, but are not limited to, solar photovoltaic systems, wind turbines, engine generators or other power generation sources.

Dwelling: A building designed for use as a residence for no more than four families or a single-family unit in a building under a condominium form of ownership.

Economically Disadvantaged Rural Community (EDRC): (Defined in 42 U.S.C. § 5133(a) as small impoverished community) is a community of 3,000 or fewer individuals identified by the applicant that is economically disadvantaged, with residents having an average per capita annual income not exceeding 80% of the national per capita income, based on best available data.

Elevated building: A building that has no basement and the lowest floor is elevated to or above the Base Flood Elevation by foundation walls, shear walls, posts, piers, pilings or columns. Solid perimeter foundations walls are not an acceptable means of elevating buildings in Zones V and VE.

Environmental benefits: Direct or indirect contributions that ecosystems make to the environment and human populations. For FEMA BCA, certain types of environmental benefits may be realized when homes are removed and land is returned to open space uses. Benefits may include flood hazard reduction; an increase in recreation and tourism; enhanced aesthetic value; and improved erosion control, air quality and water filtration.

Equipment: Tangible personal property (including information technology systems) having a useful life of more than one year and a per-unit acquisition cost that equals or exceeds the lesser of the capitalization level established by the non-federal entity for financial statement purposes or $5,000.[516]

Executive authorized signature authority: The individual, designated by the governor or tribal chief executive, who serves as the grant administrator for all the funds provided under BRIC and FMA; the person empowered by the governor or tribal chief executive to execute, on behalf of the state or tribe, all necessary documents for assistance.

Federal agency: Any department, independent establishment, government corporation or other agency of the executive branch of the federal government, including the U.S. Postal Service but not the American National Red Cross.

Federal award: The federal financial assistance that a recipient receives directly from FEMA or indirectly from a pass-through entity or the instrument such as the FEMA-State Agreement, cooperative agreement or other agreement setting forth the terms and conditions of the financial assistance.

Federal awarding agency: The federal agency that provides a federal award directly to a non-federal entity.

Federal award date: The date when the federal award is signed by the authorized official of the federal awarding agency.

Federally recognized tribal government:[517] The governing body of any Indian or Alaska Native tribe, band, nation, pueblo, village or community that the Secretary of the Interior acknowledges to exist as an Indian tribe under the Federally Recognized Indian Tribe List Act of 1994.[518] This does not include

[516] 2 CFR § 200.1
[517] Section 102(6) of the Stafford Act (42 U.S.C. § 5122(6)); 44 CFR § 201.2; 44 CFR § 206.431; 44 CFR § 77.2(f).
[518] Public Law 103-454 (Nov. 2, 1994), 25 U.S.C. § 5130.

Alaska Native corporations, the ownership of which is vested in private individuals. Also known as Indian Tribal Government.

Final expenditure report: A complete and accurate report the recipient submits to FEMA for a subaward, certifying that the award terms and conditions have been met and project costs are reconciled.

Firebreak: A strip of cleared land that provides a gap in vegetation or other combustible material that is expected to slow or stop the progress of a wildfire.

Fireproofing: Removal or treatment of fuels to reduce the danger of fires igniting or spreading (e.g., fireproofing roadsides, campsites, structural timber).

Fire-resistant material: Material that has a property that prevents or retards the passage of excessive heat, hot gases or flames under conditions of use.

Fire retardant: A chemical applied to lumber or other wood products to slow combustion and flame spread.

Fire severity zone: Three concentric zones around a building used to determine the most effective design for defensible space.

Flammability: The relative ease with which fuels ignite and burn regardless of the quantity of the fuels.

Flood Insurance Rate Map (FIRM): Official map of a community on which FEMA has delineated both the special hazard areas and the risk premium zones applicable to the community. A FIRM that has been made available digitally is called a Digital Flood Insurance Rate Map (DFIRM).

Floodplain: Any land area that FEMA has determined has at least a 1% chance in any given year of being inundated by floodwaters from any source.

Floodplain management: The operation of an overall program of corrective and preventive measures for reducing flood damage, including but not limited to, emergency preparedness plans, flood risk reduction works and floodplain management regulations.

Floodway: The channel of a river or other watercourse and the adjacent land areas that must be reserved to discharge the base flood without cumulatively increasing the water surface elevation more than a designated height. Communities regulate development in these floodways to ensure there are no increases in upstream flood elevations.

Freeboard: A factor of safety usually expressed in feet above a flood level for purposes of floodplain management. “Freeboard” tends to compensate for the many unknown factors that could contribute to flood heights greater than the height calculated for a selected size flood and floodway conditions, such as wave action, bridge openings and the hydrological effect of urbanization of the watershed.

Fuel break: A natural or manmade change in fuel characteristics that affects fire behavior so that fires burning into them can be more readily controlled.

Fuel condition: Relative flammability of fuel as determined by fuel type and environmental conditions.

Governor's authorized representative: The individual, designated by the governor, who serves as the grant administrator for all funds provided under HMGP; the person empowered by the governor to execute, on behalf of the state, all necessary documents for disaster assistance.

Gray infrastructure: Human-made structures that are engineered to provide a specific level of service under specific scenarios and generally addresses a single purpose. Gray infrastructure is also known as traditional infrastructure.

Green infrastructure: A subset of nature-based solutions, which consists of a sustainable approach to natural landscape preservation and stormwater management that can be used for hazard mitigation activities as well as provide additional ecosystem service benefits. Green infrastructure methods use an ecosystem-based approach to replicate a site's predevelopment condition and function.

Green open space: Green open space is land that does not directly touch a natural body of water, such as a river, lake, stream, creek or coastal body of water.

Grid-connected system: Solar photovoltaic system that comprises photovoltaic modules, required mounting hardware and inverters for conversion of direct current (DC) to alternating current (AC) power, but no energy storage capacity, and must be interconnected to the local utility grid for power when the photovoltaic modules cannot generate sufficient power.

Hazard mitigation officer: The representative of a state, tribal or territorial government who is the primary point of contact with FEMA, other federal agencies and local units of government in the planning and implementation of pre- and post-disaster mitigation activities.

Hazard mitigation planning: A process used by governments to identify risks, assess vulnerabilities and develop long-term strategies for protecting people and property from the effects of future natural hazard events.

Hazardous fuels reduction: An activity in an area strategically located in relation to predicted fire hazard and occurrence for which the vegetation has been permanently modified or replaced so that fires burning into it can be more easily controlled (e.g., vegetation management activities).

HMGP lock-in/ceiling: The maximum amount of HMGP funding available to a recipient for a particular major disaster declaration.

HMGP Post Fire available assistance amount: The aggregated maximum amount of HMGP Post Fire funding available to a recipient for the fiscal year based on their total number of FMAG declarations.

Hybrid system: Hybrid photovoltaic system may be either connected to the grid or have a backup battery system in addition to another means of generation, such as a traditional generator (using diesel or natural gas as fuel), combined heat and power (CHP), or wind turbine.

Identified for further review: Subapplications identified for further review contain sufficient information for a preliminary determination of cost-effectiveness and feasibility. In certain instances, FEMA may work with applicants to confirm cost-effectiveness and feasibility. Identification for further review is not a notification of award.

Ignition-resistant construction: Construction standards based on use of fire-resistant materials, noncombustible materials and one-hour fire-rated assemblies.

Increased cost of compliance: Coverage for expenses a property owner must incur, above and beyond the cost to repair the physical damage the structure actually sustained from a flooding event, to comply with mitigation requirements of state or local floodplain management ordinances or laws; acceptable mitigation measures are structure elevation, dry floodproofing, structure relocation, structure demolition or any combination thereof.

Indian tribal government: Refer to "Federally recognized tribal government" above.

Indirect cost: Costs incurred for a common or joint purpose benefitting more than one cost objective and not readily assignable to the cost objectives specifically benefited without effort disproportionate to the results achieved.

Indirect cost rate: Percentage established by a federal department or agency for a non-federal entity to use in computing the dollar amount it charges to the award to reimburse itself for indirect costs incurred in doing the work of the award activity.

Inverter: Device that converts the DC power output of the solar photovoltaic panels into AC power that is compatible with the electrical power equipment at the facility and the utility supply.

Local government: Any county, municipality, city, town, township, public authority, school district, special district, intrastate district, council of governments (regardless of whether the council of governments is incorporated as a nonprofit corporation under state law), regional or interstate government entity, or agency or instrumentality of a local government; any tribe or authorized tribal organization, or Alaska Native village or organization that is not a federally recognized tribe; and any rural community, unincorporated town or village, or other public entity.

Major disaster declaration: Any natural catastrophe (including any hurricane, tornado, storm, high water, wind-driven water, tidal wave, tsunami, earthquake, volcanic eruption, landslide, mudslide, snowstorm or drought) or, regardless of cause, any fire, flood or explosion, in any part of the United States that, in the determination of the President, causes damage of sufficient severity and magnitude to warrant disaster assistance under the Stafford Act to supplement the efforts and available resources of states, local governments and disaster relief organizations in alleviating the damage, loss, hardship or suffering caused thereby.

Management costs: Any indirect costs, any direct administrative costs, and any other administrative expense associated with a specific project under a major disaster, emergency, disaster preparedness or mitigation activity or measure. For HMGP, management cost funding is provided outside of federal assistance limits defined at 44 CFR § 206.432(b).

Manufactured (mobile) home: A structure, transportable in one or more sections, that is built on a permanent chassis and designed for use with or without a permanent foundation when attached to the required utilities.

Market value: The amount in cash, or on terms reasonably equivalent to cash, for which in all probability the property would have sold on the effective date of the valuation, after a reasonable exposure time on the open competitive market, from a willing and reasonably knowledgeable seller to a willing and reasonably knowledgeable buyer, with neither acting under any compulsion to buy or sell, giving due consideration to all available economic uses of the property at the time of the valuation.[519]

Microgrid: Group of interconnected energy-consuming devices and equipment (e.g., homes, businesses or industrial facilities) and DERs within clearly defined electrical boundaries that act as a single controllable entity with respect to the utility grid.

Mitigation: Any sustained action taken to reduce or eliminate long-term risk to life and property from a hazard event.

Mitigation activity: A mitigation measure, project, plan or action proposed to reduce risk of future damage, hardship, loss or suffering from disasters. The term "measure" is used interchangeably with the term "project" in this program.

National Flood Insurance Program (NFIP): Federal program that provides the availability of flood insurance in exchange for the adoption of a minimum local floodplain management ordinance that regulates new and substantially improved development in identified flood hazard areas.

National Mitigation Investment Strategy: A product the Mitigation Framework Leadership Group developed upon the recommendation of the Government Accountability Office in GAO-15-515: *Hurricane Sandy: An Investment Strategy Could Help the Federal Government Enhance National Resilience for Future Disasters* (July 2015). It was published in the summer of 2019. The goal of the Investment Strategy is to identify, prioritize and guide investments in pre- and post-disaster resilience and hazard mitigation-related activities. The Investment Strategy is risk-informed; grounded in data; and incorporates state, local, tribal, territorial and private-sector perspectives.

New construction: The construction of a new structure (including the placement of a mobile home) or facility or the replacement of a structure or facility that has been totally destroyed.

[519] As defined by the *Uniform Appraisal Standards for Federal Land Acquisitions* (2016).

Noncombustible material: Material of which no part will ignite and burn when subjected to fire, such as any material conforming to ASTM International Standard E136: *Standard Test Method for Assessing Combustibility of Materials Using a Vertical Tube Furnace at 750ºC*.

Non-federal cost share: The portion of the costs of a federally assisted project or program not borne by the federal government.

Non-federal entity: A state government, local government, federally recognized tribe or private nonprofit organization that carries out a federal award as a recipient or subrecipient (or a grantee or subgrantee as referenced in the previous versions of the guidance).

Nonflammable: Material unlikely to burn when exposed to flame under most conditions.

Non-federal funds: Financial resources provided by sources other than the federal government. The term does not include funds provided to a state or local government through a federal grant unless the authorizing statute for that grant explicitly allows the funds to be used as cost share for other federal grants.

Non-residential structure: Includes but is not limited to small business concerns, places of worship, schools, farm buildings (including grain bins and silos), pool houses, clubhouses, recreational buildings, mercantile structures, agricultural and industrial structures, warehouses, hotels and motels with normal room rentals for less than six months' duration, and nursing homes.

Notice of Funding Opportunity (NOFO): A formal announcement of the availability of federal funding through a financial assistance program from a federal awarding agency. The NOFO provides information on the award, who is eligible to apply, the evaluation criteria for selection of an awardee, required components of an application and how to submit the application.

Obligation: A legal commitment by FEMA to pay amounts in accordance with the grant agreement.

Office of Environmental Planning and Historic Preservation (OEHP): A FEMA office that integrates the protection and enhancement of environmental, historic and cultural resources into the FEMA mission and FEMA programs and activities; ensures FEMA activities and programs related to disaster response and recovery, hazard mitigation and emergency preparedness comply with federal EHP laws and executive orders; and provides EHP technical assistance to FEMA staff; federal, state and local partners; and recipients and subrecipients.

Otherwise protected areas: Designation created by the Coastal Barrier Improvement Act of 1990.[520] Flood insurance is restricted in Otherwise Protected Areas even though they are not in the CBRS and may receive other forms of federal assistance. Otherwise Protected Areas are identified on FEMA FIRMs.

[520] Public Law 101-591 (Nov. 16, 1990)

Pass-through entity: A non-federal entity that provides a subaward to a subrecipient to carry out part of a federal program.

Period of performance: According to 2 CFR § 200.1, period of performance means the total estimated time interval between the start of an initial federal award and the planned end date, which may include one or more funded portions, or budget periods. For HMA programs, the period of performance is the time during which the non-federal entity may incur new obligations to carry out the work authorized under the federal award. According to 2 CFR § 200.211, the federal awarding agency must include start and end dates of the period of performance in the federal award. According to 2 CFR § 200.332, the pass-through entity must include start and end dates of the period of performance in the subaward.

Pile burning: Piling removed vegetation into manageable piles and burning the individual piles during safe and approved burning conditions.

Post-flood insurance rate map building: A building for which construction or substantial improvement occurred after Dec. 31, 1974, or on or after the effective date of an initial FIRM, whichever is later.

Practicable: An action that is capable of being done within existing constraints. The test of what is practicable depends upon the situation and includes consideration of all pertinent factors, such as environment, cost and technology.

Pre-flood insurance rate map building: A building for which construction or substantial improvement occurred on or before Dec. 31, 1974, or before the effective date of an initial FIRM.

Prescribed burning: The deliberate and managed use of fire ignited by management actions to meet specific fuels management objectives.

Private Nonprofit (PNP): An eligible private nonprofit is any private nonprofit educational, utility, emergency, medical, or custodial care facility, including a facility for older adults and people with disabilities, any other facility providing essential governmental services to the general public, and such facilities on Indian reservations. For further information refer to 44 CFR § 206.221(e) and 44 CFR § 206.434(a)(2).

Project: Any mitigation measure or action proposed to reduce risk of future damage, hardship, loss or suffering from disasters.

Public Assistance (PA): Supplementary federal assistance provided under the Stafford Act to state and local governments or certain private nonprofit organizations other than assistance for the direct benefit of individuals and families.[521]

[521] 44 CFR Part 206, Subpart G and 44 CFR Part 206, Subpart H

Recipient: A non-federal entity that receives a federal award directly from a federal awarding agency to carry out an activity under a federal program. The term recipient does not include subrecipients.

Replacement cost value: The cost to replace property with materials of like kind and quality, without any deduction for depreciation.

Resilience: The ability to prepare for anticipated hazards, adapt to changing conditions, and withstand and recover rapidly from disruptions.

Required work: Activities to complete the approved scope of work.

Riparian area: The land that directly abuts a natural body of water, such as a river, lake, stream, creek or coastal body of water.

Slash: The accumulation of vegetative materials such as tops, limbs, branches, brush and miscellaneous residue results from forest management activities such as thinning, pruning, timber harvesting and wildfire hazard mitigation.

Small impoverished community (Economically Disadvantaged Rural Community (EDRC)): A community of 3,000 or fewer individuals identified by the applicant that is economically disadvantaged, with residents having an average per capita annual income not exceeding 80% of the national per capita income, based on best available data.

Solar panel mounting assemblies: Systems and structures used to secure the solar photovoltaic panels.

Solar photovoltaic panels: Devices used to convert light energy from the sun into DC electricity, also called a module.

Special Flood Hazard Area (SFHA): The land in the floodplain within a community subject to a 1% or greater chance of flooding in any given year. An area having special flood, mudflow or flood-related erosion hazards. Shown on a Flood Hazard Boundary Map or a FIRM as Zone A, AO, A1–A30, AE, A99, AH, AR, AR/A, AR/AE, AR/AH, AR/AO, AR/A1–A30, V1–V30, VE or V.

Stand-alone solar system: A stand-alone solar photovoltaic system comprises photovoltaic modules, required mounting hardware, inverters for conversion of DC to AC power, and a backup battery system for local energy storage allowing for continued service to loads in the absence of a utility power source or when the photovoltaic modules cannot generate sufficient power.

Structural fire protection: The protection of homes or other buildings from wildland fire.

Subapplicant: The entity, such as a community/local government, federally recognized tribe, or private nonprofit that submits a subapplication to the applicant for FEMA assistance. Once funding is awarded, the subapplicant becomes the “subrecipient.”

Subaward: An award provided by a pass-through entity to a subrecipient for the subrecipient to carry out part of a federal award received by the pass-through entity. It does not include payments to a contractor or payments to an individual that is a beneficiary of a federal program. A subaward may be provided through any form of legal agreement, including an agreement that the pass-through entity considers a contract.

Subrecipient: A non-federal entity that receives a subaward from a pass-through entity to carry out part of a federal program but does not include an individual that is a beneficiary of such program. A subrecipient may also be a recipient of other federal awards directly from a federal awarding agency.

Subrecipient authorized representative: The individual who serves as the grant administrator for all funds provided under the HMA programs to execute all necessary documents for assistance on behalf of the subapplicant/subrecipient.

Substantial damage: Damage of any origin sustained by a building whereby the cost of restoring the building to its before-damaged condition would equal or exceed 50% of the market value of the building before the damage occurred.

Substantial improvement: Any reconstruction, rehabilitation, addition or other improvement of a structure, the cost of which equals or exceeds 50% of the market value of the structure before the "start of construction" of the improvement. This term includes structures that have incurred "substantial damage," regardless of the actual repair work performed.[522]

Termination: The ending of a federal award, in whole or in part, at any time prior to the planned end of a period of performance. A lack of available funds is not a termination.[523]

Tribal authorized representative: The individual, designated by the tribal chief executive, who serves as the grant administrator for all funds provided under HMGP; the person empowered by the tribal chief executive to execute, on behalf of the tribe, all necessary documents for disaster assistance.

Tribal chief executive: The person who is the chief, chairman, governor, president, or similar executive official of an Indian tribal government.[524]

Void: A subaward for which no federal funds have been allocated or obligated and the recipient no longer wishes to complete the activity. No final claim letter will be sent to the recipient once the subaward is void and closed.

Whole community: The National Mitigation Framework addresses individuals, nonprofit entities and nongovernmental organizations, the private sector, communities, critical infrastructure interests, governments, and the nation as a whole. Engaging the whole community is critical to success, and

[522] Refer to 44 CFR § 9.4 for the full definition.
[523] 2 CFR § 200.1
[524] 42 U.S.C. § 5122(12)

individual and community preparedness is a key component. The whole community includes children; individuals with disabilities and others with disabilities; those from religious, racial and ethnically diverse backgrounds; and people with limited English proficiency. Their contributions must be integrated into mitigation/resilience efforts, and their needs must be incorporated as the whole community plans and executes its core capabilities.

Wildfire: An uncontrolled fire spreading through vegetative fuels, exposing and possibly consuming structures.

Wildland urban interface: The zone of transition between unoccupied land and human development. It is the line, area or zone where structures and other human development meet or intermingle with undeveloped wildland or vegetative fuels.

Withdrawn subaward: A subaward for which federal funds have been allocated and obligated, but the recipient no longer wishes to complete the activity. A final claim letter will be sent to the recipient once the subaward is withdrawn and closed. Remaining funding must be de-obligated from the subaward.

C. Authorizing Statutes and Regulations

Mitigation activities must adhere to all relevant statutes, regulations and requirements, including:

- **Statutes**:
  - HMGP and HMGP Post Fire: Section 404 of the Robert T. Stafford Disaster Relief and Emergency Assistance Act (Stafford Act), Public Law 100-707 (Nov. 23, 1988), as amended, 42 U.S.C. § 5170c.
  - BRIC: Section 203 of the Stafford Act, 42 U.S.C. § 5133.
  - FMA: Sections 1366 and 1367 of the National Flood Insurance Act of 1968, Public Law 90-448 (Aug. 1, 1968), as amended, 42 U.S.C. § 4104c, 42 U.S.C. § 4104d.
  - Mitigation Planning: Section 322 of the Stafford Act, 42 U.S.C. § 5165.
  - Management Costs: Section 324 of the Stafford Act, 42 U.S.C. § 5165b.
  - Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970, Public Law 91-646 (Jan. 2, 1971), as amended, 42 U.S.C. Chapter 61.
  - American Indian Religious Freedom Act of 1978, Public Law 95-341 (Aug. 11, 1978), 42 U.S.C. § 1996.
  - Archeological and Historic Preservation Act of 1974, Public Law 93-291 (May 24, 1974), 16 U.S.C. §§ 469 - 469c.
  - Archeological Resources Protection Act of 1979, Public Law 96-95 (Oct. 31, 1979), 16 U.S.C. §§ 470aa - mm.
  - Clean Air Act Amendments of 1990, Public Law 101-549 (Nov. 15, 1990), 42 U.S.C. Chapter 85.
  - Disaster Recovery Reform Act of 2018, Division D, Public Law 115-254 (Oct. 5, 2018).
  - Federal Water Pollution Control Act (Clean Water Act), Public Law 92-500 (Oct. 18, 1972), 33 U.S.C. § 1251 et seq.
  - Sections 10 and 14 of the Rivers & Harbors Appropriation Act of 1899; Chapter 425, 30 Stat. 1151 (March 3, 1899), 33 U.S.C. § 403 and 33 U.S.C. § 408, respectively.
  - Coastal Zone Management Act of 1972, Public Law 92-583 (Oct. 27, 1972), 16 U.S.C. § 1451 et seq.

- Coastal Barrier Resources Act of 1982, Public Law 97-348 (Oct. 18, 1982), 16 U.S.C. §§ 3501 - 3510.
- Endangered Species Act of 1973, Public Law 93–205 (Dec. 27, 1973), 16 U.S.C. § 1351 et seq.
- Farmland Protection Policy Act, Subtitle I of Title XV, Section 1539-1549 of the Agriculture and Food Act of 1981, Public Law 97-98 (Dec. 22, 1981), 7 U.S.C. Chapter 73.
- Fish and Wildlife Conservation Act, Public Law 96-366 (Sep. 29, 1980), 16 U.S.C. § 2901.
- National Environmental Policy Act, Public Law 91-190 (Jan. 1, 1970), 42 U.S.C. § 4321.
- National Historic Preservation Act, Public Law 89-665 (Oct. 15, 1966), 16 U.S.C. § 470.
- Native American Graves and Repatriation Act of 1990, Public Law 101-601, (Nov. 16, 1990), 25 U.S.C. §§ 3001 - 3013.
- Resource Conservation and Recovery Act, Public Law 94-580 (Oct. 21, 1976), 42 U.S.C. § 6901 et seq.
- Wild and Scenic Rivers Act of 1968, Public Law 90-542 (Oct. 2, 1968), 16 U.S.C. § 1271 et seq.
- Wilderness Act of 1964, Public Law 88–577 (Sep. 3, 1964), 16. U.S.C. §§ 1131 - 1136.

- **Regulations and other governing documents**:
  - 2 CFR Part 200*: Uniform Administrative Requirements, Cost Principles, and Audit Requirements for Federal* Awards (as adopted by the Department of Homeland Security at 2 CFR Part 3002).
  - 36 CFR Part 800: *Protection of Historic Properties*.
  - 44 CFR Part 9: *Floodplain Management and Protection of Wetlands*.
  - 44 CFR Part 25: *Uniform Relocation Assistance and Real Property Acquisition for Federal and Federally Assisted Programs.*
  - 44 CFR Part 60: *Criteria for Land Management and Use*.
  - 44 CFR Part 77: *Flood Mitigation Grants*.
  - 44 CFR Part 80: *Property Acquisition and Relocation for Open Space*.

- 44 CFR Part 201: *Mitigation Planning*.
- 44 CFR Part 206, Subpart J: *Coastal Barrier Resources Act*.
- 44 CFR Part 206, Subpart N: *Hazard Mitigation Grant Program*.
- Federal Acquisition Regulation Subpart 31.2: *Contracts with Commercial Organizations*.

- **Executive Orders**:
  - Executive Order 11988 on *Floodplain Management* (May 24, 1977).
  - Executive Order 11990 on *Protection of Wetlands* (May 24, 1977).
  - Executive Order 12898 on *Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations* (Feb. 11, 1994).
  - Executive Order 13007 on *Indian Sacred Sites* (May 24, 1996).
  - Executive Order 13166 on *Improving Access to Services for Persons with Limited English Proficiency* (Aug. 11, 2000).
  - Executive Order 13690 on *Establishing a Federal Flood Risk Management Standard and a Process for Further Soliciting and Considering Stakeholder Input* (Jan. 30, 2015).
  - Executive Order 13985 on *Advancing Racial Equity and Support for Underserved Communities Through the Federal Government* (Jan. 20, 2021).
  - Executive Order 13990 on *Protecting Public Health and the Environment and Restoring Science to Tackle the Climate Crisis* (Jan. 20, 2021).
  - Executive Order 14008 on *Tackling the Climate Crisis at Home and Abroad* (Jan. 27, 2021).
  - Executive Order 14030 on *Climate-Related Financial Risk* (May 20, 2021)
- FEMA Directive 108-1, *Environmental Planning and Historic Preservation Responsibilities and Program Requirements* (Oct. 10, 2018).
- OMB Circular A-94, *Guidelines and Discount Rates for Benefit-Cost Analysis of Federal Programs*.
- Other applicable federal, state, local, tribal and territory laws; implementing regulations; and executive orders.

Federal Laws Prohibiting Discrimination in Emergency Programs Based on Disability:

- Rehabilitation Act of 1973, Public Law 93-112 (Sep. 26, 1973).
- Americans with Disabilities Act of 1990, Public Law 101-336 (July 26, 1990).
- The Stafford Act, Public Law 100-707 (Nov. 23, 1988).
- Post-Katrina Emergency Management Reform Act of 2006, Public Law 109-295 (Oct. 4, 2006).
- Fair Housing Act Amendments of 1988, Public Law 100-430 (Sep. 13, 1988).
- Architectural Barriers Act of 1968, Public Law 90-480 (Aug. 12, 1968).
- Individuals with Disabilities Education Act of 1975, Public Law 101-476 (Oct. 30, 1990).
- Telecommunications Act of 1996, Public Law 104-104 (Feb. 8, 1996).
- Twenty-First Century Communications and Video Accessibility Act of 2010, Public Law 111–260 (Oct. 8, 2010).

D. HMGP Project Subapplication Minimum Eligibility Criteria Checklist

The purpose of the HMGP Project Subapplication Minimum Eligibility Criteria Checklist is to ensure that applications/subapplications submitted to FEMA contain the minimum criteria for eligibility. For additional project types not listed below, refer to Part 11 (other than mitigation planning and planning-related activities) and Part 12. For mitigation planning activities, refer to Appendix E.

If an application/subapplication lacks the necessary eligibility information, FEMA cannot determine eligibility and approve an application. If information is lacking, FEMA may request additional information during the review process. Each requirement lists the section of the HMA Guide where more information can be found. The checklist below is intended as a helpful resource, and it is not a request for information.

Table 38. HMGP Project Subapplication Minimum Eligibility Criteria Checklist

Question	Yes	No	Notes
General Requirements			
Is necessary documentation included in the subapplication? (Part 6.B.3)			
Is this a phased project? (Part 4.D.3)			
Is technical assistance needed? The subapplicant is encouraged to contact the applicant to request application development assistance. FEMA resources may be available but will only be provided if requested by the applicant. (Part 4.D.1.4)			
Applicants and Subapplicants			
Is an eligible applicant identified? (states, federally recognized tribal governments and territories) (Part 4.A)			
Is an eligible subapplicant identified? (state agencies, local governments, federally recognized tribal governments and private nonprofit organizations) (Part 4.B)			
If applicable, does the applicant/subapplicant participate in the National Flood Insurance Program? (Part 4.H)			
Hazard Mitigation Plan Update Requirements			

Question	Yes	No	Notes
Does the applicant/subapplicant have a hazard mitigation plan? (Part 4.C)			
Is the proposed HMA project(s) in conformance with the State Mitigation Plan and Local or Tribal Mitigation Plan approved under 44 CFR Part 201? (Part 4.C.2.2 and Part 6.C)			
Scope of Work Requirements			
Does the scope of work describe the proposed activity, and is it an eligible project type? (Part 6.C.1)			
For construction projects, have alternatives been considered as part of the decision-making process and are they described? (Part 6.C.1.2)			
Are photographs of each structure and the general project area included? (Part 6.F.1)			
Is geographic information about the activity being scoped (and clearly labeled maps) included? (Part 6.F and Part 6.C.1.2)			
Is the latitude, longitude and address for each structure provided? (Part 6.C.1.2)			
Does the scope of work explain why the selected activity is the most practical, effective and environmentally sound option? (Part 6.C.1.2)			
Have long-term changes to the area been considered and has documentation regarding long-term maintenance been provided? (Part 6.C.1.2)			
Does the activity solve a problem independently or does it constitute a functional portion of a solution? (Part 4.D.2 and Part 4.G)			
Does the activity address a repetitive problem or significant risk to public health?[525]			
Schedule Requirements			

[525] 44 CFR § 206.434(c)(5)(i).

Question	Yes	No	Notes
Does the schedule identify major milestones that reflect the scope of work and that do not exceed the period of performance of the award? (Part 6.C.2)			
Budget Requirements			
Has a budget and a budget narrative been provided that supports the scope of work? (Part 6.C.3)			
If the project requires phased or incremental funding, does the budget reflect the amount estimated for each funding increment? (Part 6.C.3.1)			
Have the non-federal cost share and match sources been identified? (Part 6.B.3 and Part 6.C.3)			
Does the project report the availability or receipt of duplicative grants, loans, insurance payments, legal claims, gifts or other payments pertaining to the property being mitigated using HMA (potential duplication of benefits such as insurance and Small Business Administration loans if information is available during project development)? (Part 4.M.7)			
Cost-Effectiveness and Feasibility Requirements			
Does the project include a benefit-cost analysis, alternate cost-effectiveness documentation (such as substantial damage verification and located in a riverine floodplain; pre-calculated benefits) or a narrative supporting cost-effectiveness and request for consideration under 5% HMGP discretionary funding? (Part 5.C.1.6 and Part 6.D)			
Does the project include technical information to support the proposed action? (Part 6.E and Part 6.C.1.2)			
Environmental and Historic Preservation Requirements			
Does the project demonstrate conformance with environmental and historic preservation requirements? (Part 6.F.1)			
Assurance Requirements			

Question	Yes	No	Notes
Has the statement of assurances been provided? Assurances may vary for construction or non-construction activities.[526] (Part 6.B.3)			
Has SF-LLL, Disclosure of Lobbying Activities, been provided?[527] (Part 6.B.3)			
Mitigation Project Requirements			
The following sections outline the minimum eligibility criteria for project specific activities.			
Property Acquisition Requirements			
Does the project comply with the timelines and all other criteria set forth in 44 CFR Part 80, including the deed restriction language consistent with the FEMA *Model Deed Restriction*? (Part 12.B.1.2)			
Does the project identify eligible activities such as: ▪ Acquisition and Relocation (Part 12.B.1.2)? ▪ Acquisition and Demolition (Part 12.B.1.2)?			
If applicable, has documentation that the property owner is a national of the United States or a qualified alien been provided? (Part 12.B.1.2)			
Does the project include voluntary participation documentation for each property? (Part 12.B.1.3.2)			
For properties that are to be relocated, will the structure be relocated outside of the Special Flood Hazard Area? (Part 12.B.1.4.2)			
Structure Elevation Requirements			
Does the project identify the is or elevation required by FEMA or local ordinance? (Part 12.B.3.3)			
Does the project include finished floor elevation? *Elevation Certificate* (FEMA Form 086-0-33) is preferred. (Part 12.B.3.3)			

[526] Available on grants.gov under the SF-424 Family. The assurances may include SF-424A, Budget Information for Non-Construction; SF-424B, Assurances for Non-Construction; SF-424C, Budget Information for Construction; and SF-424D, Assurances for Construction

[527] Available on grants.gov

Question	Yes	No	Notes
Does the project include the proposed elevation height of the structure? (Part 12.B.3.3)			
Is the project designed and implemented consistent with latest ASCE-24 or equivalent? (Part 12.B.3.2.2.1)			
Flood Risk Reduction Requirements			
Does the project include initial technical information to support size, costs and local permitting requirements? (Part 12.B.5.3)			
Does the project describe how it will reduce flooding depths and damage and specify the level of protection provided? (Part 12.B.5.3)			
Safe Room Requirements			
Does the project include the population size and basis? (Part 12.B.8.2.2.1)			
Is the safe room project located outside of FEMA-designated SFHAs? Or, is the safe room project located in a FEMA-designated SFHA area (or the 500-year flood hazard area) but the 8-step Decision Process has successfully been completed for Executive Order (EO) 11988 on *Floodplain Management* (May 24, 1977),[528] (i.e., the consultation with the local and state emergency management officials led to the conclusion that there is no other feasible option than having the safe room project sited in an SFHA or the 500-year flood hazard area, as outlined in FEMA P-361)? (Part 12.B.8.2.1)			
Is the safe room designed and implemented consistent with FEMA P-361? (Part 12.B.8.2.7)			
Wind Retrofit Requirements			
Does the project include the proposed level of protection? (Part 12.B.10.3.2)			
Has the project been designed and implemented consistent with P-804? (Part 12.B.10.2.5)			

[528] As amended by EO 13690 on *Establishing a Federal Flood Risk Management Standard and a Process for Further Soliciting and Considering Stakeholder Input* (Jan. 30, 2015), as provided by 44 CFR § 9.6

Question	Yes	No	Notes
Secondary Power Source Requirements			
Does critical facility information include data such as the date the structure was built, building type and the functions provided, construction type and additional details relating to the existing condition of the structure? (Part 12.B.11.3)			

E. HMGP Planning Subapplication Minimum Eligibility Criteria Checklist

The purpose of the HMGP Planning Subapplication Minimum Eligibility Criteria Checklist is to ensure that applications/subapplications submitted to FEMA contain the minimum criteria for eligibility. For mitigation projects, refer to Appendix D.

If an application/subapplication lacks the necessary eligibility information, FEMA cannot determine eligibility and approve an application. If information is lacking, FEMA may request additional information during the review process. Each requirement lists the section of the HMA Guide where more information can be found. The checklist below is intended as a helpful resource, and it is not a request for information.

Table 39. HMGP Planning Subapplication Minimum Eligibility Criteria Checklist

General Requirements			
Question	Yes	No	Notes
Is the subapplication number and title included? (Part 11.A.4.1)			
Applicants and Subapplicants			
Question	Yes	No	Notes
Is an eligible applicant identified? (states, federally recognized tribal governments and territories) (Part 4.A)			
Is an eligible subapplicant identified? (state agencies, local governments, federally recognized tribal governments and private nonprofit organizations) (Part 4.B)			
If the application/subapplication activity is for planning updates or planning related activities, does the applicant/subapplicant have a current mitigation plan? (Part 11.A.4.1 and Part 11.A.4.2)			
Scope of Work Requirements			
Question	Yes	No	Notes
Is the proposed mitigation planning activity, as described in the scope of work, eligible for the program and describes how the proposed activity			

aligns with the current mitigation plan? (Part 11.A.4.1)			
Is the proposed planning activity described, including whether it will result in a new or updated hazard mitigation plan or enhance an existing mitigation plan, in accordance with the FEMA mitigation planning regulation at 44 CFR Part 201 and HMA Guide? (Part 11.A.4.1)			
Are participating jurisdiction(s) and private nonprofits, if applicable, identified and described? (Part 11.A.4.1)			
Does the narrative describe procedures to engage stakeholders and participating jurisdictions? (Part 11.A.4.1)			
Does the scope of work discuss approaches, outcomes and level of effort, including key milestones and schedule and the relationship of each activity to the cost estimate? (Part 11.A.4.1)			
Hazard Mitigation Plan Update Requirements			
Question	Yes	No	Notes
Does the scope of work describe the process that each jurisdiction will complete to review each section of the previous plan and address gaps, as needed; new information (including hazard, land use and development trends); how the previous plan was implemented; and what process will be used? (Part 11.A.4.1)			
Schedule Requirements			
Question	Yes	No	Notes
Does the application include a work schedule within the period of performance and allow sufficient time for state or tribal and FEMA reviews; preparation of required revisions, if needed; formal adoption by the jurisdiction(s); and FEMA approval? (Part 11.A.4.1)			
Cost Review Requirements			
Question	Yes	No	Notes

Does the application include a detailed cost estimate that supports the scope of work and is reasonable for the jurisdiction(s) participating? Lump-sum cost estimates are not eligible and will not be accepted. (Part 11.A.4.3)			
Does the application or subapplication identify information on the required non-federal cost share and contribution sources? (Part 6.C.3.2)			

C HAZARD ANALYSIS

The hazard identification and ranking were obtained primarily from the Eastern Municipal Water District (EMWD) Hazard Identification exercise. The Hazard Identification exercise was conducted as a participatory Taskforce workshop to identify the potential hazards within EMWD. The Hazard Identification Workshop was facilitated using an interactive spreadsheet that asked specific questions on potential hazards and then rated them accordingly. These questions guide the team in the correct facilitation and application of the program. The following information summarizes the Hazard Identification Workshop risk ranking results, including the descriptions of each hazard factor, and provides the specific descriptor choices for each risk factor and description. Additionally, a risk ranking matrix is provided to designate the overall ranking score and categorization of each hazard.

Hazard Identification and Risk Ranking

Each hazard profile included a profile ranking of the hazard (ranging from low risk to high risk). The Taskforce determined this initial profile ranking based on all of the hazard identified and profile research, group discussion, and evaluation of all of the data, including numerical rankings (1-5) of the following criteria:

- **Consequence/Severity** – How widespread is the impact area?
- **Secondary Effects** – Could the event trigger another event and separate response?
- **Probability/Frequency** – Historical view of how often this type of event occurs locally and projected recurrence intervals.
- **Warning/Onset** – Advance warning of the event, or none.
- **Duration** – Length of elapsed time where response resources are active.
- **Recovery** – Length of time until lives and property return to normal.

Risk Factors for Hazard Identification			
Risk Factor	**Description**	**Descriptors**	**Value**
Probability/ Frequency	Prediction of how often a hazard will occur in the future	Infeasible event - not applicable due to geographic location characteristics	0
		Rare event - occurs less than once every 50 years	1
		Infrequent event - occurs between once every 8 years and once every 50 years (inclusive)	2
		Regular event - occurs between once a year and once every 7 years	3
		Frequent event - occurs more than once a year	4
Consequence/ Severity	Physical Damage - structures and lifelines Economic Impact – loss of function for power, water, sanitation, roads, etc.	No damage	1
		Minor/slight damage to buildings and structures, no loss of lifelines	2
		Moderate building damage, minor loss of lifelines (less than 12 hours)	3
		Moderate building damage, lifeline loss (less than 24 hours)	4
		Extensive building damage, widespread loss of lifelines (water, gas, electricity, sanitation, roads), loss of life	5
Vulnerability	Impact Area - area impacted by a hazard event Secondary Impacts - Capability of triggering additional hazards Onset - Period between initial recognition of an approaching hazard and when the hazard begins to impact the community	No physical damage, no secondary impacts	1
		Localized damage area	2
		Localized damage area, minor secondary impacts, delayed hazard onset	3
		Moderate damage area, moderate secondary impacts, moderate warning time	4
		Widespread damage area, significant secondary impacts, no warning time	5

Each profile includes a ranking of the hazard. The hazard rankings were determined by assigning each hazard the appropriate risk factors as described above. The risk factors were then used with a hazard ranking matrix to determine the final hazard score. The following table provides the matrix used for determining each hazard's score.

Risk Ranking Matrix

Probability/Frequency Description	Risk Ranking Matrix						
	Probability/Frequency Value	1	Consequence/Severity				
			1	2	3	4	5
Rare Event: Occurs less than once every 50 years	Vulnerability	1	1	2	3	4	5
		2	2	4	6	8	10
		3	3	6	9	12	15
		4	4	8	12	16	20
		5	5	10	15	20	25
	Probability/Frequency Value	2	Consequence/Severity				
			1	2	3	4	5
Infrequent Event: Occurs between once every 8 years and once every 50 years (inclusive)	Vulnerability	1	2	4	6	8	10
		2	4	8	12	16	20
		3	6	12	18	24	30
		4	8	16	24	32	40
		5	10	20	30	40	50
	Probability/Frequency Value	3	Consequence/Severity				
			1	2	3	4	5
Regular Event: Occurs between once a year and once every 7 years	Vulnerability	1	3	6	9	12	15
		2	6	12	18	24	30
		3	9	18	27	36	45
		4	12	24	36	48	60
		5	15	30	45	60	75
	Probability/Frequency Value	4	Consequence/Severity				
			1	2	3	4	5
Frequent Event: Occurs more than once a year	Vulnerability	1	4	8	12	16	20
		2	8	16	24	32	40
		3	12	24	36	48	60
		4	16	32	48	64	80
		5	20	40	60	80	100

The hazard scores from the Hazard Ranking Matrix were compared to the hazard rank criteria to categorize each hazard with a hazard ranking. The table below provides the value determinations for each hazard ranking.

Risk Rank Categorization	
High Hazard	50 to 100
Moderately High Hazard	25 to 49
Moderate Hazard	15 to 24
Moderately Low Hazard	5 to 14
Low Hazard	1 to 4

The hazard ranking worksheets are provided in the following pages.

HAZARD IDENTIFICATION AND RISK RANKING

Earthquake

Hazard Rank Factors	Hazard Factor Description	Rank
Probability	Regular event - occurs between once a year and once every 7 years	3
Consequence	Extensive building damage, widespread loss of lifelines (water, gas, electricity, sanitation, roads), loss of life	5
Vulnerability	Widespread damage area, significant secondary impacts, no warning time	5
Risk	High	75
Comments		

Extreme Weather

Hazard Rank Factors	Hazard Factor Description	Rank
Probability/Frequency	Frequent event - occurs more than once a year	4
Consequence/Severity	Moderate building damage, minor loss of lifelines (less than 12 hours), lost time injury but no disability	3
Vulnerability	Localized damage area, minor secondary impacts, delayed hazard onset	3
Risk	Moderately High	36
Comments	The Taskforce combined previously separated hazards including extreme heat, severe storm, windstorm and tornado to form the extreme weather hazard.	

Infrastructure Failure

Hazard Rank Factors	Hazard Factor Description	Rank
Probability	Frequent event - occurs more than once a year	4
Consequence	Moderate building damage, lifeline loss (less than 24 hours), severe injury or disability	4
Vulnerability	Localized damage area	2
Risk	Moderate	32
Comments	The Taskforce noted that small deviances from normal operations (i.e., pipeline failures) are a regular occurrence. However, when addressing Infrastructure failure, the team focused on large-scale scenarios such as a main break.	

HAZARD IDENTIFICATION AND RISK RANKING

Flood & Dam/Reservoir Failure

Hazard Rank Factors	Hazard Factor Description	Rank
Probability	Infrequent event - occurs between once every 8 years and once every 50 years (inclusive)	2
Vulnerability	Moderate building damage, lifeline loss (less than 24 hours), severe injury or disability	4
Consequence	Moderate damage area, moderate secondary impacts, moderate warning time	4
Risk	Moderately High	32
Comments	The Taskforce combined flood and dam/reservoir failure hazards as having the same potential impacts for EMWD	

Wildfire

Hazard Rank Factors	Hazard Factor Description	Rank
Probability	Regular event - occurs between once a year and once every 7 years	3
Consequence	Moderate building damage, minor loss of lifelines (less than 12 hours), lost time injury but no disability	3
Vulnerability	Localized damage area, minor secondary impacts, delayed hazard onset	3
Risk	Moderately High	27
Comments	The Taskforce acknowledged that wildfires are regular occurrence in California therefore has taken it into account for the ranking	

Terrorism

Hazard Rank Factors	Hazard Factor Description	Rank
Probability	Rare event - occurs less than once every 50 years	1
Consequence	Extensive building damage, widespread loss of lifelines (water, gas, electricity, sanitation, roads), loss of life	5
Vulnerability	Widespread damage area, significant secondary impacts, no warning time	5
Risk	Moderately High	25
Comments	The Taskforce noted assumed water contamination, or an intentional release of hazardous chemicals was the most likely terrorism scenario for EMWD. Hazard ranking estimates were based on these types of scenarios.	

HAZARD IDENTIFICATION AND RISK RANKING

Hazardous Material Release

Hazard Rank Factors	Hazard Factor Description	Rank
Probability	Rare event - occurs less than once every 50 years	1
Consequence	Extensive building damage, widespread loss of lifelines (water, gas, electricity, sanitation, roads), loss of life	5
Vulnerability	Widespread damage area, significant secondary impacts, no warning time	5
Risk	Moderately High	25
Comments	As the San Onofre Nuclear Plant is no longer operational, it was removed from the list of identified hazards. However, as the plant is still storing hazardous materials which are transported through EMWD Service Area, the Taskforce expanded the range of the Hazard Material Release hazard to include the release of any hazardous material during transport throughout the Service Area	

Power Failure

Hazard Rank Factors	Hazard Factor Description	Rank
Probability	Frequent event - occurs more than once a year	4
Consequence	Moderate building damage, minor loss of lifelines (less than 12 hours), lost time injury but no disability	3
Vulnerability	Localized damage area	2
Risk	Moderate	24
Comments	PSPS have prompted EMWD to establish plans for power failures/shutoffs	

Drought

Hazard Rank Factors	Hazard Factor Description	
Probability	Regular event - occurs between once a year and once every 7 years	3
Consequence	Localized damage area	1
Vulnerability	Localized damage area, minor secondary impacts, delayed hazard onset	3
Risk	Moderately High	9
Comments	The Taskforce recognized drought as a regular occurrence and has made mitigation efforts to counter the potential impacts	

D PUBLIC PARTICIPATION & PLANNING PROCESS DOCUMENTATION

To include valuable input from the community as part of the development of a Hazard Mitigation Plan (HMP), the Eastern Municipal Water District (District) solicited public participation during the plan development; including a survey sent out to EMWD's constant contact database prior to the plans completion.

The survey included 10 questions designed to provide insight into the community's opinion on perceived vulnerability for certain hazard events, to clarify which methods the community prefers to receive educational and outreach materials, and to illustrate the participants' overall level of hazard awareness.

Upon completion of the initial draft HMP, the Plan is to be posted on EMWD's website initiating a period of public comment. Upon approval by the State and FEMA the public comment period will close. Any subsequent suggestions or recommendations that would benefit the plan will be included as part of an update.

D1. Survey Contents and Responses

This section includes the survey questions. The Survey was released on April 3, 2023, and remained available for three weeks while the draft was being completed. During that time, EMWD received over 1,280 responses to the survey. This is enough responses for EMWD to make inferences on the community's opinion on the plan update. The survey questions are provided below.

emwd EASTERN MUNICIPAL WATER DISTRICT

EMWD Wants Your Input For Our Local Hazard Mitigation Plan

Dear EMWD Customer,

Eastern Municipal Water District (EMWD) is committed to doing its part to serve our communities and lessen the impact in the event of a natural disaster. Should there be a major earthquake, fire or other natural disaster, we will do everything within our power to restore service quickly and safely.

In an effort to more effectively prepare, we are conducting a local survey to assist us in updating our Local Hazard Mitigation Plan (LHMP). This plan identifies natural hazards throughout our service area and provides an assessment of facilities that may be most vulnerable. This plan outlines potential actions to minimize risk and future damage.

Your valuable input in this voluntary short survey will assist us in the review and improvement of this Plan. With your help, we can all be better prepared for the unexpected.

We thank you for your time and appreciate your input as we work to efficiently serve our community.

Sincerely,
EMWD

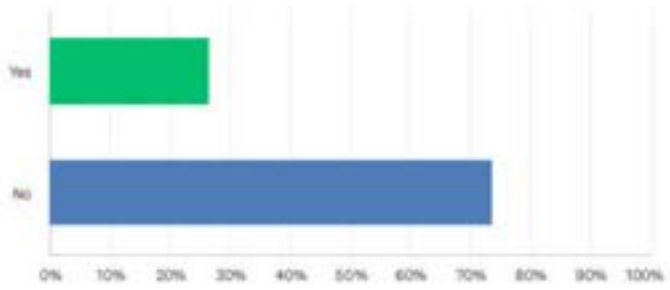
Take the Survey

Eastern Municipal Water District | (951) 928-3777 | www.emwd.org

Local Hazard Mitigation Plan Survey

Q1 In the past five years, have you or someone in your household experienced a disaster such as an earthquake, drought, flood, wildfire, or other type of disaster?

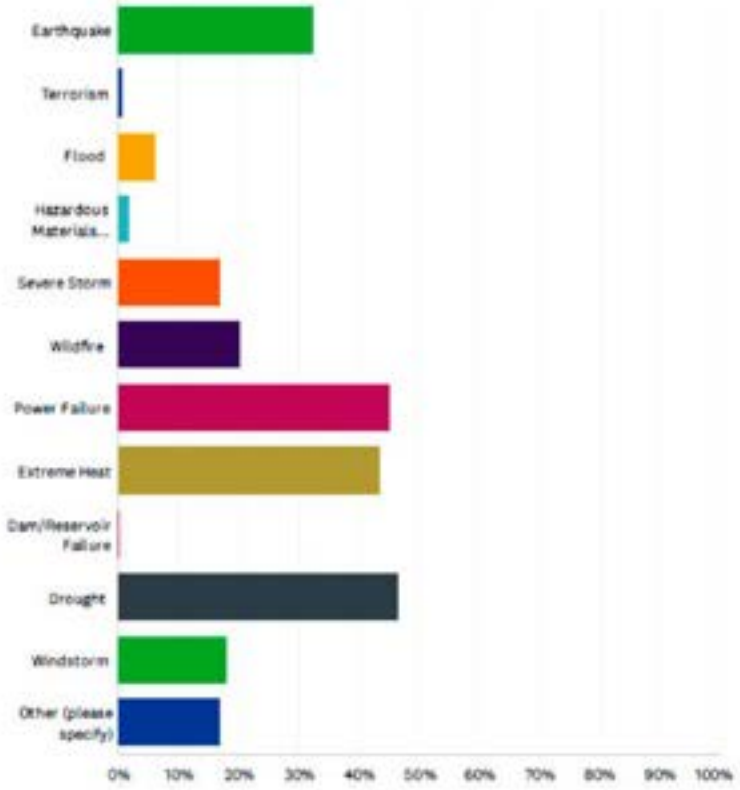
Answered: 1,289 Skipped: 8



ANSWER CHOICES	RESPONSES	
Yes	26.53%	342
No	73.47%	947
TOTAL		1,289

Q2 If yes, have you, or someone in your household, experienced any of the following disasters?

Answered: 659 Skipped: 636

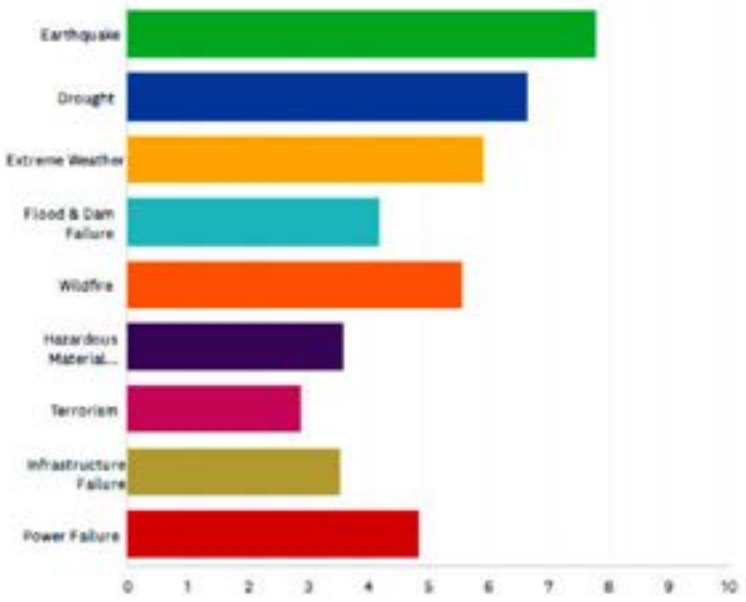


Local Hazard Mitigation Plan Survey

ANSWER CHOICES	RESPONSES	
Earthquake	32.47%	214
Terrorism	0.61%	4
Flood	6.22%	41
Hazardous Materials Release	1.67%	11
Severe Storm	17.15%	113
Wildfire	20.33%	134
Power Failure	45.22%	298
Extreme Heat	43.40%	286
Dam/Reservoir Failure	0.30%	2
Drought	46.43%	306
Windstorm	18.21%	120
Other (please specify)	17.00%	112
Total Respondents: 659		

Q3 How concerned are you about the following disasters affecting the community? (Drop and Drag Rank Order)

Answered: 1,256 Skipped: 39

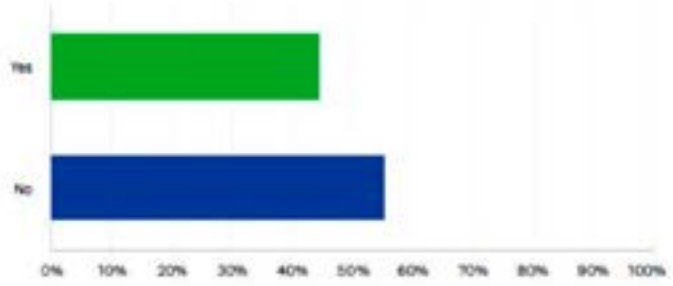


Local Hazard Mitigation Plan Survey

	1	2	3	4	5	6	7	8	9	TOTAL	SCORE
Earthquake	50.48% 634	18.87% 237	12.18% 153	8.28% 104	4.70% 59	2.71% 34	1.51% 19	0.64% 8	0.64% 8	1,256	7.81
Drought	16.08% 202	29.54% 371	16.88% 212	12.10% 152	9.24% 116	7.40% 93	3.42% 43	2.71% 34	2.63% 33	1,256	6.66
Extreme Weather	6.13% 77	13.38% 168	26.59% 334	17.36% 218	14.57% 183	9.47% 119	6.53% 82	3.74% 47	2.23% 28	1,256	5.93
Flood & Dam Failure	1.19% 15	2.79% 35	6.53% 82	19.82% 249	15.13% 190	16.32% 205	15.76% 198	10.19% 128	12.26% 154	1,256	4.19
Wildfire	9.87% 124	12.58% 158	11.70% 147	12.90% 162	23.65% 297	12.74% 160	8.84% 111	4.62% 58	3.11% 39	1,256	5.57
Hazardous Material Release	0.72% 9	3.11% 39	3.50% 44	5.97% 75	7.80% 98	28.66% 360	22.05% 277	20.54% 258	7.64% 96	1,256	3.60
Terrorism	2.71% 34	1.67% 21	3.50% 44	3.42% 43	5.65% 71	6.45% 81	26.99% 339	20.70% 260	28.90% 363	1,256	2.88
Infrastructure Failure	2.39% 30	6.05% 76	5.89% 74	7.25% 91	9.63% 121	10.03% 126	10.99% 138	30.18% 379	17.60% 221	1,256	3.54
Power Failure	10.43% 131	12.02% 151	13.22% 166	12.90% 162	9.63% 121	6.21% 78	3.90% 49	6.69% 84	25.00% 314	1,256	4.83

Q4 Have you ever received, requested, or researched information on ways to make your family and/or home safer from local hazards?

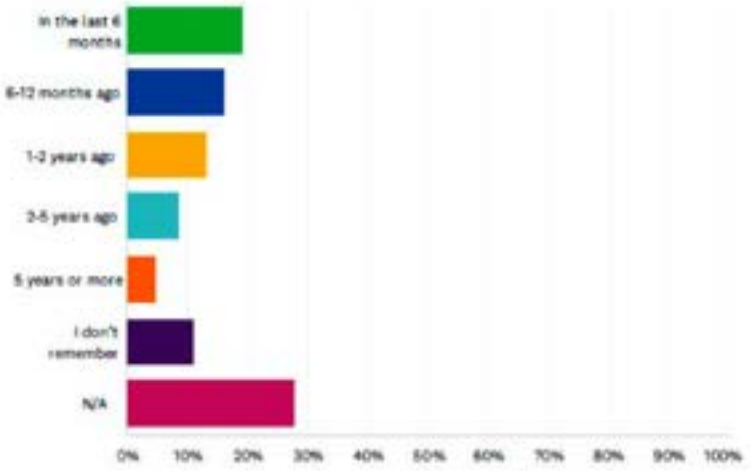
Answered: 1,287 Skipped: 8



ANSWER CHOICES	RESPONSES	
Yes	44.60%	574
No	55.40%	713
TOTAL		1,287

Q5 How recently did you receive this information?

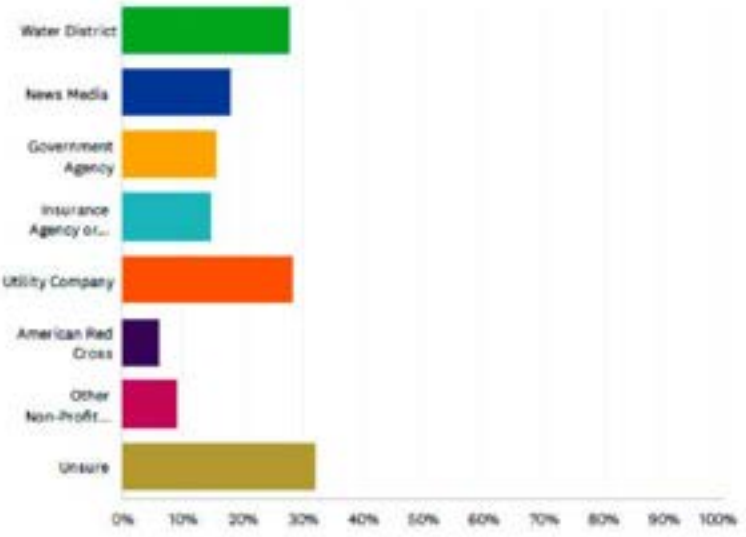
Answered: 930 Skipped: 365



ANSWER CHOICES	RESPONSES	
In the last 6 months	18.92%	176
6-12 months ago	16.13%	150
1-2 years ago	13.12%	122
2-5 years ago	8.60%	80
5 years or more	4.73%	44
I don't remember	10.86%	101
N/A	27.63%	257
TOTAL		930

Q6 From whom did you last receive this information?

Answered: 783 Skipped: 512

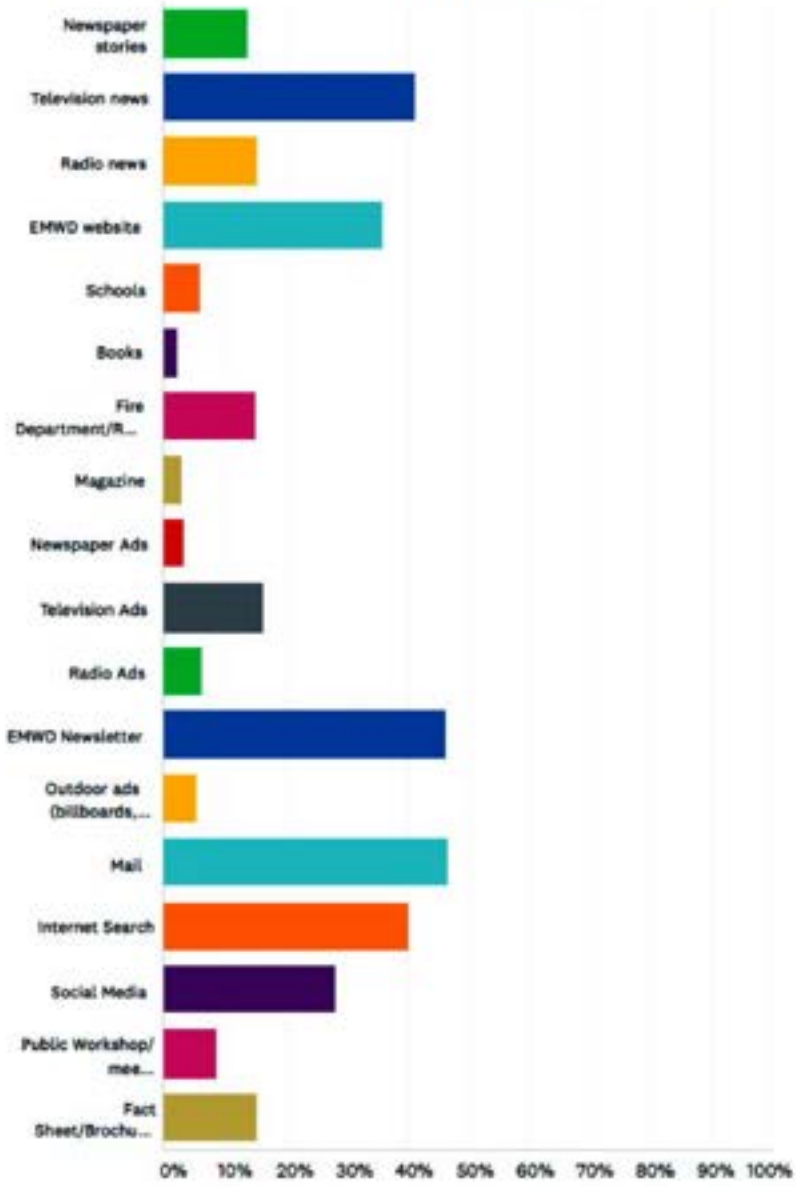


ANSWER CHOICES	RESPONSES	
Water District	27.71%	217
News Media	18.01%	141
Government Agency	15.58%	122
Insurance Agency or Company	14.81%	116
Utility Company	28.35%	222
American Red Cross	5.87%	46
Other Non-Profit Organization	8.94%	70
Unsure	31.93%	250
Total Respondents: 783		

Local Hazard Mitigation Plan Survey

Q7 What are the best ways for you to receive information about making your family and home safer from local disasters?

(Please check all that apply) Answered: 1,276 Skipped: 19



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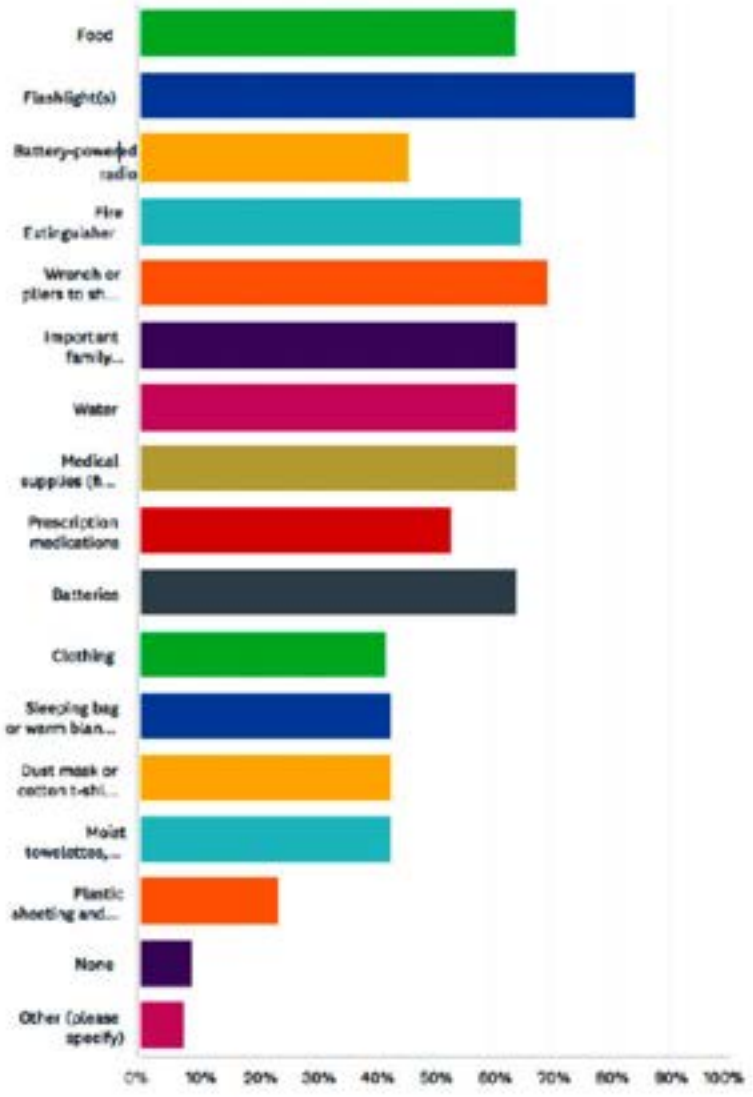
Local Hazard Mitigation Plan Survey

ANSWER CHOICES	RESPONSES	
Newspaper stories	13.40%	171
Television news	41.30%	527
Radio news	15.13%	193
EMWD website	35.89%	458
Schools	5.80%	74
Books	2.04%	26
Fire Department/Rescue	14.73%	188
Magazine	2.82%	36
Newspaper Ads	3.06%	39
Television Ads	16.22%	207
Radio Ads	6.27%	80
EMWD Newsletter	46.24%	590
Outdoor ads (billboards, etc.)	5.41%	69
Mail	46.39%	592
Internet Search	40.36%	515
Social Media	28.21%	360
Public Workshop/meeting	8.39%	107
Fact Sheet/Brochure at local city facility or event	14.89%	190
Total Respondents: 1,276		

Local Hazard Mitigation Plan Survey

Q8 What steps, if any, have you or someone in your household taken to prepare for a disaster? (Please check all that apply)

Answered: 1,284 Skipped: 11



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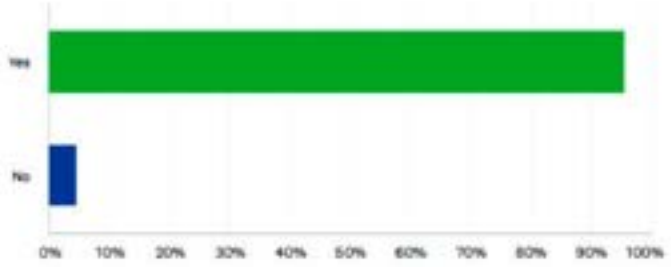
Local Hazard Mitigation Plan Survey

ANSWER CHOICES	RESPONSES	
Food	63.71%	818
Flashlight(s)	84.27%	1,082
Battery-powered radio	45.64%	586
Fire Extinguisher	64.72%	831
Wrench or pliers to shut off utilities	69.39%	891
Important family documents	64.10%	823
Water	64.17%	824
Medical supplies (first aid kit)	64.17%	824
Prescription medications	52.96%	680
Batteries	64.25%	825
Clothing	41.74%	536
Sleeping bag or warm blanket for each person	42.52%	546
Dust mask or cotton t-shirt (for air filtering)	42.45%	545
Moist towelettes, garbage bags and plastic ties for personal sanitation	42.45%	545
Plastic sheeting and duct tape (to shelter in-place)	23.44%	301
None	8.49%	109
Other (please specify)	7.32%	94
Total Respondents: 1,284		

Q9 Do you live in the District's Service Area?

Answered: 1,275 Skipped: 20



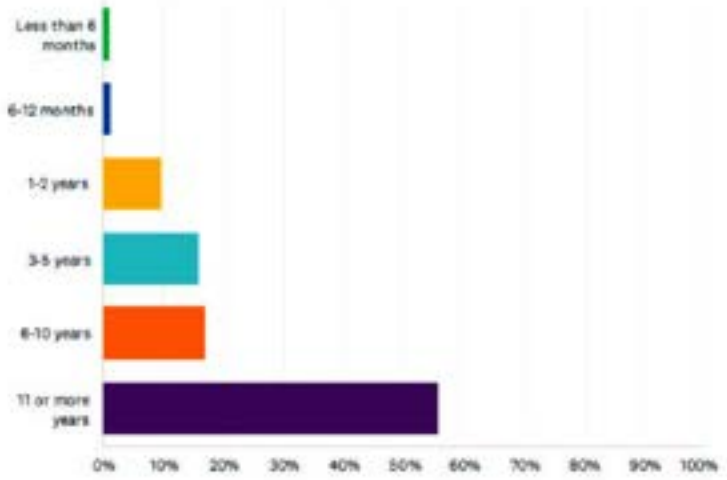
ANSWER CHOICES	RESPONSES	
Yes	95.45%	1,217
No	4.55%	58
TOTAL		1,275

Q10 Home zip code

Answered: 1,272 Skipped: 23

Q11 How many years have you lived in the District's service area?

Answered: 1,282 Skipped: 13



ANSWER CHOICES	RESPONSES	
Less than 6 months	0.78%	10
6-12 months	1.33%	17
1-2 years	9.52%	122
3-5 years	15.76%	202
6-10 years	17.00%	218
11 or more years	55.62%	713
TOTAL		1,282

Appendix D

CENSUS INFORMATION 2020

United States Census Bureau

QuickFacts

Lake Elsinore city, California; French Valley CDP, California; Nuevo CDP, California

QuickFacts provides statistics for all states and counties, and for cities and towns with a ***population of 5,000 or more***.

Table

All Topics	Lake Elsinore city, California	French Valley CDP, California	Nuevo CDP, California
With a disability, under age 65 years, percent, 2017-2021	**5.9%**	**7.5%**	**6.4%**
PEOPLE			
Population			
Population Estimates, July 1, 2022, (V2022)	71,898	X	X
Population estimates base, April 1, 2020, (V2022)	70,244	X	X
Population, percent change - April 1, 2020 (estimates base) to July 1, 2022, (V2022)	2.4%	X	X
Population, Census, April 1, 2020	70,265	35,280	6,733
Population, Census, April 1, 2010	51,821	23,067	6,447
Age and Sex			
Persons under 5 years, percent	8.2%	6.9%	8.0%
Persons under 18 years, percent	29.7%	33.4%	30.0%
Persons 65 years and over, percent	8.8%	10.0%	9.7%
Female persons, percent	51.2%	50.8%	52.5%
Race and Hispanic Origin			
White alone, percent	46.9%	54.7%	55.5%
Black or African American alone, percent (a)	7.7%	9.5%	1.0%
American Indian and Alaska Native alone, percent (a)	0.5%	0.7%	0.0%
Asian alone, percent (a)	7.5%	12.0%	0.1%
Native Hawaiian and Other Pacific Islander alone, percent (a)	0.2%	1.7%	0.5%
Two or More Races, percent	11.0%	12.3%	17.9%
Hispanic or Latino, percent (b)	50.0%	29.3%	68.4%
White alone, not Hispanic or Latino, percent	31.5%	41.1%	24.3%
Population Characteristics			
Veterans, 2017-2021	2,681	3,020	192
Foreign born persons, percent, 2017-2021	21.9%	14.9%	24.4%

Housing			
Housing units, July 1, 2022, (V2022)	X	X	X
Owner-occupied housing unit rate, 2017-2021	69.7%	82.4%	75.9%
Median value of owner-occupied housing units, 2017-2021	$392,200	$486,600	$375,400
Median selected monthly owner costs -with a mortgage, 2017-2021	$2,260	$2,837	$2,090
Median selected monthly owner costs -without a mortgage, 2017-2021	$661	$838	$620
Median gross rent, 2017-2021	$1,691	$2,412	$1,394
Building permits, 2022	X	X	X
Families & Living Arrangements			
Households, 2017-2021	19,162	10,032	1,816
Persons per household, 2017-2021	3.59	3.87	4.13
Living in same house 1 year ago, percent of persons age 1 year+, 2017-2021	89.9%	83.0%	93.8%
Language other than English spoken at home, percent of persons age 5 years+, 2017-2021	41.7%	23.7%	54.3%
Computer and Internet Use			
Households with a computer, percent, 2017-2021	97.5%	99.9%	95.5%
Households with a broadband Internet subscription, percent, 2017-2021	92.1%	98.4%	92.6%
Education			
High school graduate or higher, percent of persons age 25 years+, 2017-2021	84.1%	92.9%	73.7%
Bachelor's degree or higher, percent of persons age 25 years+, 2017-2021	22.2%	32.6%	13.7%
Health			
With a disability, under age 65 years, percent, 2017-2021	**5.9%**	**7.5%**	**6.4%**
Persons without health insurance, under age 65 years, percent	⚠ 9.2%	⚠ 4.2%	⚠ 10.0%
Economy			
In civilian labor force, total, percent of population age 16 years+, 2017-2021	64.2%	59.6%	62.0%
In civilian labor force, female, percent of population age 16 years+, 2017-2021	57.4%	57.0%	51.8%
Total accommodation and food services sales, 2017 ($1,000) (c)	103,258	2,564	NA
Total health care and social assistance receipts/revenue, 2017 ($1,000) (c)	57,434	7,991	NA
Total transportation and warehousing receipts/revenue, 2017 ($1,000) (c)	16,050	11,866	7,885
Total retail sales, 2017 ($1,000) (c)	958,625	36,759	7,044
Total retail sales per capita, 2017 (c)	$15,089	NA	NA
Transportation			
Mean travel time to work (minutes), workers age 16 years+, 2017-2021	42.5	41.6	43.8

Income & Poverty			
Median household income (in 2021 dollars), 2017-2021	$80,350	$116,972	$89,891
Per capita income in past 12 months (in 2021 dollars), 2017-2021	$28,320	$35,371	$27,248
Persons in poverty, percent	⚠ 13.2%	⚠ 6.6%	⚠ 13.0%

BUSINESSES

Businesses			
Total employer establishments, 2021	X	X	X
Total employment, 2021	X	X	X
Total annual payroll, 2021 ($1,000)	X	X	X
Total employment, percent change, 2020-2021	X	X	X
Total nonemployer establishments, 2019	X	X	X
All employer firms, Reference year 2017	957	203	S
Men-owned employer firms, Reference year 2017	520	S	S
Women-owned employer firms, Reference year 2017	117	53	S
Minority-owned employer firms, Reference year 2017	326	37	S
Nonminority-owned employer firms, Reference year 2017	455	S	S
Veteran-owned employer firms, Reference year 2017	25	S	S
Nonveteran-owned employer firms, Reference year 2017	765	182	S

GEOGRAPHY

Geography			
Population per square mile, 2020	1,837.6	3,244.7	994.4
Population per square mile, 2010	1,431.2	2,122.6	952.1
Land area in square miles, 2020	38.24	10.87	6.77
Land area in square miles, 2010	36.21	10.87	6.77
FIPS Code	0639486	0626067	0652624

About datasets used in this table

Value Notes

⚠ Estimates are not comparable to other geographic levels due to methodology differences that may exist between different data sources.

Some estimates presented here come from sample data, and thus have sampling errors that may render some apparent differences between geographies statistically indistinguishable.] Click the Quick Info ⓘ icon to the left of each row in TABLE view to learn about sampling error.

In Vintage 2022, as a result of the formal request from the state, Connecticut transitioned from eight counties to nine planning regions. For more details, please see the Vintage 2022 release notes available here: Release Notes.

The vintage year (e.g., V2022) refers to the final year of the series (2020 thru 2022). Different vintage years of estimates are not comparable.

Users should exercise caution when comparing 2017-2021 ACS 5-year estimates to other ACS estimates. For more information, please visit the 2021 5-year ACS Comparison Guidance page.

Fact Notes

(a)	Includes persons reporting only one race
(c)	Economic Census - Puerto Rico data are not comparable to U.S. Economic Census data
(b)	Hispanics may be of any race, so also are included in applicable race categories

Value Flags

-	Either no or too few sample observations were available to compute an estimate, or a ratio of medians cannot be calculated because one or both of the median estimates falls in the lowest or upper interval of an open ended distribution.
F	Fewer than 25 firms
D	Suppressed to avoid disclosure of confidential information
N	Data for this geographic area cannot be displayed because the number of sample cases is too small.
FN	Footnote on this item in place of data
X	Not applicable
S	Suppressed; does not meet publication standards
NA	Not available
Z	Value greater than zero but less than half unit of measure shown

QuickFacts data are derived from: Population Estimates, American Community Survey, Census of Population and Housing, Current Population Survey, Small Area Health Insurance Estimates, Small Area Income and Poverty Estimates, State and County Housing Unit Estimates, County Business Patterns, Nonemployer Statistics, Economic Census, Survey of Business Owners, Building Permits.

Appendix D CENSUS INFORMATION 2020

An official website of the United States government

United States Census Bureau

QuickFacts

Highgrove CDP, California; Homeland CDP, California; Murrieta city, California; Hemet city, California; Menifee city, California; Moreno Valley city, California

QuickFacts provides statistics for all states and counties, and for cities and towns with a ***population of 5,000 or more***.

Table

All Topics	Highgrove CDP, California	Homeland CDP, California	Murrieta city, California	Hemet city, California	Menifee city, California	Moreno Valley city, California
With a disability, under age 65 years, percent, 2017-2021	**6.2%**	**6.6%**	**6.9%**	**13.9%**	**8.6%**	**7.2%**
PEOPLE						
Population						
Population Estimates, July 1, 2022, (V2022)	X	X	113,783	90,689	109,399	211,924
Population estimates base, April 1, 2020, (V2022)	X	X	110,953	89,818	102,526	208,640
Population, percent change - April 1, 2020 (estimates base) to July 1, 2022, (V2022)	X	X	2.6%	1.0%	6.7%	1.6%
Population, Census, April 1, 2020	7,515	6,772	110,949	89,833	102,527	208,634
Population, Census, April 1, 2010	3,988	5,969	103,466	78,657	77,519	193,365
Age and Sex						
Persons under 5 years, percent	10.4%	5.4%	7.2%	5.7%	6.9%	6.7%
Persons under 18 years, percent	27.1%	26.8%	28.5%	25.6%	25.4%	27.9%
Persons 65 years and over, percent	5.0%	13.9%	11.8%	21.1%	17.3%	9.3%
Female persons, percent	49.8%	50.8%	51.4%	50.9%	50.3%	50.6%
Race and Hispanic Origin						
White alone, percent	43.7%	76.5%	61.2%	63.0%	55.9%	28.7%
Black or African American alone, percent (a)	3.5%	0.6%	5.6%	9.1%	6.7%	17.9%
American Indian and Alaska Native alone, percent (a)	0.9%	0.0%	0.3%	1.2%	0.9%	0.7%
Asian alone, percent (a)	12.7%	0.3%	8.2%	2.5%	5.3%	5.3%
Native Hawaiian and Other Pacific Islander alone, percent (a)	1.0%	0.0%	0.3%	0.1%	0.7%	0.4%
Two or More Races, percent	5.1%	4.2%	13.7%	10.7%	12.5%	9.5%
Hispanic or Latino, percent (b)	59.6%	64.9%	33.3%	49.3%	39.4%	60.4%
White alone, not Hispanic or Latino, percent	22.6%	32.0%	47.3%	37.0%	43.6%	13.7%
Population Characteristics						
Veterans, 2017-2021	414	278	7,013	6,588		
Foreign born persons, percent, 2017-2021	21.0%	21.9%	14.1%	18.0%		

Housing						
Housing units, July 1, 2022, (V2022)	X	X	X	X	X	X
Owner-occupied housing unit rate, 2017-2021	63.1%	71.2%	66.8%	61.1%	78.9%	62.1%
Median value of owner-occupied housing units, 2017-2021	$515,600	$163,500	$458,000	$226,000	$371,500	$353,400
Median selected monthly owner costs -with a mortgage, 2017-2021	$2,688	$1,486	$2,507	$1,556	$2,170	$1,910
Median selected monthly owner costs -without a mortgage, 2017-2021	$785	$308	$709	$500	$524	$541
Median gross rent, 2017-2021	$1,122	$1,261	$1,996	$1,220	$1,793	$1,712
Building permits, 2022	X	X	X	X	X	X
Families & Living Arrangements						
Households, 2017-2021	1,892	2,137	33,599	30,322	32,350	53,135
Persons per household, 2017-2021	3.31	3.14	3.29	2.91	3.12	3.91
Living in same house 1 year ago, percent of persons age 1 year+, 2017-2021	80.0%	81.9%	84.3%	86.4%	86.1%	90.5%
Language other than English spoken at home, percent of persons age 5 years+, 2017-2021	42.4%	44.7%	23.7%	33.7%	25.7%	50.1%
Computer and Internet Use						
Households with a computer, percent, 2017-2021	99.0%	94.3%	97.5%	91.4%	94.6%	97.1%
Households with a broadband Internet subscription, percent, 2017-2021	91.5%	87.5%	94.4%	85.2%	90.8%	92.7%
Education						
High school graduate or higher, percent of persons age 25 years+, 2017-2021	85.9%	76.9%	92.8%	80.3%	88.2%	78.0%
Bachelor's degree or higher, percent of persons age 25 years+, 2017-2021	30.3%	11.1%	30.9%	13.8%	20.6%	17.1%
Health						
With a disability, under age 65 years, percent, 2017-2021	**6.2%**	**6.6%**	**6.9%**	**13.9%**	**8.6%**	**7.2%**
Persons without health insurance, under age 65 years, percent	⚠ 7.7%	⚠ 21.8%	⚠ 6.2%	⚠ 9.1%	⚠ 6.8%	⚠ 11.3%
Economy						
In civilian labor force, total, percent of population age 16 years+, 2017-2021	74.9%	55.6%	62.5%	50.3%	56.1%	63.5%
In civilian labor force, female, percent of population age 16 years+, 2017-2021	72.7%	43.7%	55.0%	45.2%	49.6%	55.5%
Total accommodation and food services sales, 2017 ($1,000) (c)	2,302	D	212,911	144,781	139,229	294,356
Total health care and social assistance receipts/revenue, 2017 ($1,000) (c)	NA	NA	735,257	547,479	181,438	1,035,419
Total transportation and warehousing receipts/revenue, 2017 ($1,000) (c)	D	NA	43,185	4,599	52,637	161,698
Total retail sales, 2017 ($1,000) (c)	20,201	12,499	1,666,475	1,202,897	545,991	2,941,552
Total retail sales per capita, 2017 (c)	NA	NA	$14,738	$14,232	$6,032	$14,229
Transportation						
Mean travel time to work (minutes), workers age 16 years+, 2017-2021	29.9	34.0	35.9	36.1		

Income & Poverty						
Median household income (in 2021 dollars), 2017-2021	$90,682	$50,339	$98,466	$46,194	$80,741	$73,635
Per capita income in past 12 months (in 2021 dollars), 2017-2021	$32,083	$21,631	$37,991	$23,123	$33,042	$23,914
Persons in poverty, percent	⚠ 8.0%	⚠ 16.2%	⚠ 6.1%	⚠ 17.2%	⚠ 7.9%	⚠ 13.5%
BUSINESSES						
Businesses						
Total employer establishments, 2021	X	X	X	X	X	X
Total employment, 2021	X	X	X	X	X	X
Total annual payroll, 2021 ($1,000)	X	X	X	X	X	X
Total employment, percent change, 2020-2021	X	X	X	X	X	X
Total nonemployer establishments, 2019	X	X	X	X	X	X
All employer firms, Reference year 2017	39	S	2,133	1,037	770	1,620
Men-owned employer firms, Reference year 2017	S	S	1,075	543	385	864
Women-owned employer firms, Reference year 2017	S	S	359	S	S	262
Minority-owned employer firms, Reference year 2017	S	S	470	324	S	649
Nonminority-owned employer firms, Reference year 2017	S	S	1,306	546	495	727
Veteran-owned employer firms, Reference year 2017	S	S	130	33	51	76
Nonveteran-owned employer firms, Reference year 2017	S	S	1,714	839	595	1,304
GEOGRAPHY						
Geography						
Population per square mile, 2020	2,334.6	1,585.9	3,300.9	3,067.9	2,206.1	4,064.8
Population per square mile, 2010	1,239.0	1,398.0	3,081.4	2,824.6	1,668.3	3,771.2
Land area in square miles, 2020	3.22	4.27	33.61	29.28	46.48	51.33
Land area in square miles, 2010	3.22	4.27	33.58	27.85	46.47	51.27
FIPS Code	0633574	0634316	0650076	0633182	0646842	0649270

About datasets used in this table

Value Notes

⚠ Estimates are not comparable to other geographic levels due to methodology differences that may exist between different data sources.

Some estimates presented here come from sample data, and thus have sampling errors that may render some apparent differences between geographies statistically indistinguishable.] Click the Quick Info ⓘ icon to the left of each row in TABLE view to learn about sampling error.

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D2. Inferences

As mentioned above, EMWD was able to collect enough responses from the community to make educated inferences based on participant feedback. EMWD received several completed surveys, the following inferences were made.

Participant Profile

It is important for the Taskforce to identify certain characteristics of the participating group to give proper weight to the feedback received. The survey asked participants to provide their years of residence and whether they lived within the service area. With regards to years of residence, the assumption is made that those who had lived in the region over a long period of time should have a better understanding of the hazards that have affected EMWD historically. Based on this assumption and the responses received for questions 9 and 10 above, the Taskforce can begin to assess whether the participating group have lived in the service area long enough to have a basic understanding of the hazards that affect the region.

Next, the Taskforce can begin to assess whether the participating group has actively tried to mitigate hazards in their own homes. An assumption is made that those who take a proactive role in mitigating hazards individually will have a better understanding of EMWD's efforts to mitigate the effects of regional hazards. Based on the responses from question 8 above, the Taskforce can determine whether the respondents have acted to mitigation the impacts of disasters in their own home and whether it might be sufficient to suggest a better understanding of regional disaster preparedness.

Methods for Successful Public Outreach

For several of the hazards identified by the Taskforce, public education and outreach serve as one of the main ways to mitigate future losses. While EMWD already has outreach campaigns in place, the Taskforce decided it would be useful for the public to comment on which distribution methods were best for receiving information. The data collected from these surveys will allow EMWD to maximize its outreach efforts by utilizing the methods specified by the public to guide future outreach campaign planning.

From response to questions 4-6 the Taskforce can determine which participants have received, requested, or researched safety information regarding local hazards and how they obtained the information. From these responses, the Taskforce can estimate whether

respondents are actively seeking information and, with input from question 7, determine which methods those people most prefer to receive information.

Hazard Profiling

The survey asked participants to rank identified hazards based on their level of concern. The Taskforce can tally the responses, list them from greatest to least, and create a public hazard ranking. The Taskforce can compare the public's hazard ranking to its own and decide whether changes are necessary. In addition, inferences may be drawn about mitigation activities that will be supported by the public. Assumption is made that any action that decreases the vulnerability of a scenario which had been identified as a hazard of great concern by the public will be positively viewed by the community. The Taskforce intends for EMWD to use this information to include the public's opinion as it continues to implement new mitigation measures.

D3. Public Meeting

Once a draft of the HMP was developed, the Plan was uploaded to EMWD's website on August 16, 2023. This allowed the public time to review the document and provide comments before Plan adoption. Prior to Cal OES submission, no comments were received. However, the Plan will remain on EMWD's website giving the public an ongoing opportunity to provide feedback on EMWD's hazard mitigation efforts.

D5. Planning Process

The following sections provide additional information and supporting documentation about the planning process implemented by the Taskforce to update the HMP. For descriptions of the content of each Taskforce meeting, please refer to Chapter 1.

Hazard Mitigation Plan – 5 yr. Update

Zuzzette Bricker, CEM
Safety, Risk, and Emergency Management
April 4, 2023

DISASTER MITIGATION ACT OF 2000

- Revitalized Federal Planning Requirements
  - State and Local Hazard Mitigation Plans
  - Plans must be updated every five years
- Federal Grant Funding Eligibility
  - Hazard Mitigation Grant Program (HMGP)
  - Pre-Disaster Mitigation Program (PDM)
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HMP Taskforce Goals

- Review existing Plan for implementation
- Review the list of potential hazards and add additional hazards for the revision
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- Prioritize mitigation projects for implementation

RISK ASSESSMENT METHODOLOGY

- Risk Assessment provides the foundation for the mitigation planning process, which focused on identifying and prioritizing actions to reduce risk to hazards
- FEMA recommended steps for conducting a risk assessment:
  - Describe Hazards
  - Identify Community Assets
  - Analyze Risks
  - Summarize Vulnerability

Risk Management Professionals have incorporated each of the steps into plan updating processes and have acquired Cal OES and FEMA approval using the methodology many times

RISK ASSESSMENT – POTENTIAL HAZARDS

Hazards From Previous Plan

- Earthquake
- Pipeline Failure
- Power Failure
- Terrorism
- Extreme Heat
- Flood
- Dam/Reservoir Failure
- Hazardous Material Release
- San Onofre Nuclear Plant Failure – (in decommissioning process)
- Drought
- Pandemic
- Severe Storm
- Tornado/Wind Hazard
- Wildfire
- Transportation Accident

RISK ASSESSMENT – POTENTIAL HAZARDS CONT.

Hazards Resulting From Climate Change

- Reduced Water Supply
- Increased Temperature
- Reduced Precipitation
- Diminished Snowpack
- Wildfire Risk
- Public Health and Social Vulnerability
- Stress on Special-Status Species

Previous Plan Goals

- Save Lives and Reduce Injuries
- Avoid Damages to Property
- Protect the Environment
- Promote Hazard Mitigation as an Integrated Policy

Mitigation Action Categories

- Prevention
- Property Protection
- Public Education and Awareness
- Natural Resource Protection
- Emergency Services
- Structural Projects

EARTHQUAKE EXAMPLE MITIGATION PROJECTS

- Building Retrofits
- Anchor Electrical Transformers
- Install Expansion Joints
- Reinforce Well Shaft or Install Submersible Pump
- Restrain Pipes
- Improve Pipe Materials
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- Install Friction Dampers on Elevated Tanks

EXTREME WEATHEREXAMPLE MITIGATION PROJECTS

- Retrofits
- Anchoring, Structural Bracing
- Implement Tree Trimming
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- Install “Green Roofs” to Provide Shade and Remove Heat
- Install Lightning Protection Devices
- Install and Maintain Surge Protectors for Critical Equipment
- Review Current Building Standards and Upgrade Buildings as Necessary

FLOOD/ DAM FAILURE EXAMPLE MITIGATION PROJECTS

- Acquisition, Relocation, & Elevation Projects
- Dry-Floodproofing (e.g., plastic sheeting)
- Wet-Floodproofing (e.g., water resistant materials)
- Stormwater Management Ordinances or Amendments
- Floodplain Ordinances or Amendments
- Storm Drainage System Improvements
- Structural Flood Control Measures (e.g., levees, dams, floodwalls) Inundation Zone Mapping
- Preparedness and Response Plans
- Notification Systems
- Structural Storage Tank Reservoir Improvements

INFRASTRUCTURE FAILURE EXAMPLE MITIGATION PROJECTS

- Periodic Maintenance and Inspection
- Replacement of Aged-Equipment and Pipelines
- Installation of Redundant Critical Equipment and Pipelines
- Contingency and Emergency Planning

HAZARDOUS MATERIALS RELEASE MITIGATION PROJECTS

- Review and Revise Emergency Plans
- Industrial Site Buffering
- Contingency Planning
- Improvement to Maps and Records
- Transportation
- Chemical Storage Location and Design
- Emergency Response Teams

WILDFIRE EXAMPLE MITIGATION PROJECTS

- Community Awareness
- Fire-safe Practices for Structures and Landscaping
- Enhancement of Fire-Suppression Capabilities
- Fire Risk Mapping

TERRORISM EXAMPLE MITIGATION PROJECTS

- Emergency Plans
- Emergency Response Teams
- Improved Security
- Training (Recognition and Documentation)
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Personal items of the San Bernardino shooters sit in their Redlands home. Security experts say assaults on "soft" targets such as the Inland Regional Center are now as much a risk as attacks on famous sites. (Marcus Yam / Los Angeles Times)

POWER FAILURE EXAMPLE MITIGATION PROJECTS

- Contingency Planning
- Enhancement of Emergency Response Teams
- Emergency Fuel and Water Distribution and Storage Systems
- Preparedness and Response Plans

DROUGHT EXAMPLE MITIGATION PROJECTS

- Water Use Ordinances
- Contingency Plans
- Emergency Water Distribution and Storage Systems
- Water Conservation Education
- System Retrofits
- Leak Detection Programs

HAZARD RANKING METHODOLOGY

- The risk ranking is facilitated using an automated interactive spreadsheet program that asks specific questions on potential hazards and then assigns a relative value to each potential hazard accordingly

- The result of the workshop will be a ranked list of hazards to be studied in detail in the Hazard Mitigation Plan

HAZARD RANKING – MATRIX

Table 3.2 Risk Rank Matrix

Probability/Frequency Description	Risk Ranking Matrix						
Rare Event: Occurs less than once every 50 years	Probability/Frequency Value	1	Consequence/Severity 1	2	3	4	5
	Vulnerability	1	1	2	3	4	5
		2	2	4	6	8	10
		3	3	6	9	12	15
		4	4	8	12	16	20
		5	5	10	15	20	25
Infrequent Event: Occurs between once every 8 years and once every 50 years (inclusive)	Probability/Frequency Value	2	Consequence/Severity 1	2	3	4	5
	Vulnerability	1	2	4	6	8	10
		2	4	8	12	16	20
		3	6	12	18	24	30
		4	8	16	24	32	40
		5	10	20	30	40	50
Regular Event: Occurs between once a year and once every 7 years	Probability/Frequency Value	3	Consequence/Severity 1	2	3	4	5
	Vulnerability	1	3	6	9	12	15
		2	6	12	18	24	30
		3	9	18	27	36	45
		4	12	24	36	48	60
		5	15	30	45	60	75
Frequent Event: Occurs more than once a year	Probability/Frequency Value	4	Consequence/Severity 1	2	3	4	5
	Vulnerability	1	4	8	12	16	20
		2	8	16	24	32	40
		3	12	24	36	48	60
		4	16	32	48	64	80
		5	20	40	60	80	100

Process

4.4 ELEMENT D. PLAN REVIEW, EVALUATION, AND IMPLEMENTATION *(Plan Updates Only)*

Requirement §201.6(d)(3)	A local jurisdiction must review and revise its plan to reflect changes in development, progress in local mitigation efforts, and changes in priorities, and resubmit if for approval within 5 years in order to continue to be eligible for mitigation project grant funding.

CAL OES

The Hazard Mitigation Plan is required to meet the requirements under the Code of Federal Regulations (CFR) Title 44 – Emergency Management and Assistance §201.6, Local Mitigation Plans for FEMA approval and eligibility to apply for FEMA Hazard Mitigation Assistance grant programs.

Once approved by CAL OES, the plan will be sent to FEMA for approval.

FEMA

FEMA will coordinate review process with the state. FEMA and the state my conduct joint review or FEMA may review after the state has completed their review.

EMWD

Adoption by the local governing body validates the jurisdiction's commitment to fulfilling the hazard mitigation goals and actions outlined in the plan.

Adoption legitimizes the plan and authorizes responsible agencies to execute their responsibilities. Updated plans also are adopted anew to demonstrate community recognition of the current planning process, changes that have occurred within the previous five years, and validate community priorities for hazard mitigation actions.

Contact Information

Zuzzette Bricker, CEM
Safety and Emergency Management Officer
(951) 928-3777 Ext. 4562
brickerz@emwd.org

MSTeams Meeting
April 4,2023

EMWD LHMP Mitigation Plan Partner agency Meeting

Full Name	User Action	Timestamp	
Bricker, Zuzzette	Joined	4/4/2023, 2:26:20 PM	EMWD
[redacted]	Joined	4/4/2023, 2:28:38 PM	Riverside County Office of Education
	Joined	4/4/2023, 2:31:09 PM	Perris Union HS District
	Joined	4/4/2023, 2:32:03 PM	RUHS
	Joined	4/4/2023, 2:33:47 PM	City of Perris

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Hazard Mitigation Plan –5 yr. Review

EMWD Hazard mitigation Taskforce – Meeting

Zuzzette Bricker, CEM
Safety, Risk, and Emergency Management
June 20, 2022

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2017 Project updates

	Hazards Mitigated	Mitigation Action Category	Responsible Department	Estimated Project Cost	Completed Y/N	2022- Status Provide information on what was done. Or why it was not done
2017.HMP.01 - Review emergency materials inventory, identify potential gaps, and procure new items to improve the continuity of operations. Include redundant structural materials to minimize emergency repair time. - Greg Burdine	All-Hazards	Emergency Services	Warehouse	$150k/year	Y	Additional pipeline materials are maintained in emergency storage for any potable/recycled pipeline that crosses an earthquake fault.
2017.HMP.02 - Review and refresh mutual aid agreements. Identify potential gaps and enter in new agreements as appropriate - Jeff Wasserman/ SREM	All-Hazards	Prevention/ Emergency Services	SREM/ Purchasing	Staff Time	Y	MOU with ERNIE and CALWARN are in place. Purchasing dept. has multiple contracts in place for emergency purchases.
2017.HMP.03 - Update the radio system to enhance communications during a disaster. - Dave Brown	All-Hazards	Emergency Services	SREM	$2,500,000	Y	Invested in a new radio system district wide. Improvement to towers ensures better coverage.
2017.HMP.04 - Purchase an additional satellite phone to improve emergency communications - SREM	All-Hazards	Emergency Services	SREM	$25,000	Y	EMWD purchased six satellite phones. There were four that have been staged at the RWRF.
2017.HMP.05 – Enhance public and student outreach programs to include education on preparing for the impacts of hazards on water and wastewater operations. – PGA/ April Coady	All-Hazards	Personnel Education and Awareness	Public and Government Affairs	$50k/year	Y	Ongoing: social media, website, and press releases outlining how to prepare emergency water supplies in the event of an interruption due to an earthquake or other disasters. Ongoing: social media and website information related to the sewer system and how to prevent spills (i.e., FOG and healthy sewers campaigns)
2017.HMP.06 – Identify repetitive pipeline break areas and incorporate pipeline replacement in the Capital Improvement Plan. Dave Garcia/ Shaun Stone/ (John Ward)	Earthquake/ Flood & Dam / Reservoir Failure	Property Protection/ Structural Project	Water Operations/ Maintenance Services	Staff Time	Y	Ongoing-Leak application was developed that allows staff to enter specifics on breaks, including exact location and probable cause. The data is displayed on a heat map to identify areas of concern.
2017.HMP.07 – Conduct an analysis of critical facilities to determine the level of imperviousness to extreme weather events and utilize the maintenance schedule to make upgrades to improve resiliency – Dave Brown	Extreme Weather	Property Protection	Water Operations/ Maintenance Services	Staff Time	Y	Ongoing-Below grade facilities are in the process of being replaced. Generators have been installed at 53 of 55 lift stations. Generators are scheduled to be added at critical booster facilities.
2017.HMP.08 – Include considerations for extreme weather (i.e., wind, high heat, excessive rain, etc.) events into new building planning documents Shaun Stone	Extreme Weather	Property Protection	Water Operations/ Maintenance Services	Staff Time	Y	Swamp coolers and A/C units are being added where necessary. All facilities are designed to meet current building codes, with wildfire mitigation as an additional consideration.

2017 Projects … continued

	Hazards Mitigated	Mitigation Action Category	Responsible Department	Estimated Project Cost	Completed Y/N	2022- Status Provide information on what was done. Or why it was not done
2017.HMP.09 – Enhance the EMWD's Emergency 24/7 webpage to include tips for the public for extreme weather as they pertain to water service PGA/ April Coady	Extreme Weather	Personnel Education and Awareness	SREM	Staff Time	Y	EMWD's 24/7 Emergency Information webpage (https://www.emwd.org/247-emergency-information) includes information about: • Preventing Frozen Pipes • PSPS events Emergency Preparedness: How to prepare emergency water supplies
2017.HMP.10 – Elevate at-risk subterranean facilities to above grade locations A list of facilities requiring elevation can be found (add location – Corey to look for list) – Shaun Stone	Flood & Dam/Reservoir Failure	Structural Project	Operations/ Engineering	$10mil/ project	Y	As new facilities and upgrades are being made, locations are being assessed to ensure resiliency.
2017.HMP.11 – Identify facilities located within the updated dam inundation zones currently under development by Riverside County and implement mitigation projects as appropriate. – John Ward/ SREM	Flood & Dam/Reservoir Failure	Property Protection	SREM/ Engineering Services	Staff Time	N	Due to budgetary constraints EMWD was unable to move forward with this project.
2017.HMP.12 – Review and enhance infrastructure maintenance and monitoring schedules to increase the opportunity to identify and repair equipment prior to failure. – Dave Brown/ Kenny Tagney/ Matt Melendrez	Infrastructure Failure/ Power Failure	Prevention	Operations and Maintenance	Staff Time	Y	Ongoing-This is assessed regularly to ensure facilities and equipment have preventative maintenance performed at the proper intervals.
2017.HMP.13 – Review brush clearance standards, particularly for facilities in fringe areas, and identify ways to expand clearance areas. Prioritize those facilities in areas identified as being vulnerable to wildfire.- Dave Brown	Wildfire	Property Protection	Maintenance Services	Staff Time	N	In progress-Facilities have been identified Contracts and agreements will be executed to ensure resiliency efforts can continue.
2017.HMP.14 – Purchase emergency water tenders for use during wildfire/ seismic incidents – (Nothing done at this time)	Wildfire/ Earthquake	Property Protection	SREM	$1,500,000	N	Due to budgetary constraints EMWD was unable to make the purchase at this time. Will include in next HMP update.
2017.HMP.15 – Identify opportunities to enhance training for the Hazardous Materials Emergency Response Team and implement improvements as appropriate. – (Nothing done at this time)	Hazardous Material Release/ Earthquake	Personnel Education and Awareness	SREM	$90k/year	N	Due to the identification of additional needs no action was taken at this time. Will continue with updated project in the update HMP.
2017.HMP.16 – Implementation of proposed Capital Improvement Projects to augment water supply (Perris II Desalination and San Jacinto Valley enhanced recharge and Recovery Program Phase 1) – John Ward	Drought	Structural Projects	Water Operations	$30,000,000- $25,000,000	Y	Perris II Desalter project completed.

Considerations for new Projects?

Mitigation Project	Benefit (Pros)	Costs (Cons)	Priority
2023.HMP.01 - Review emergency materials inventory, identify potential gaps, and procure items to improve continuity of operations. Include redundant structural materials to minimize emergency repair time.	• Avoided Loss-of-Function Costs • Avoided Emergency Management Costs • Increased ability to share resources and improve regional emergency response (Cal WARN)	• Staff Time to review inventory and source equipment. • Equipment Costs ($100K/year)	Medium
2023.HMP.02 - Emergency Operations Center upgrades and training. Coordinate training for all EOC responders. Laptops for response capabilities, and additional technology to impro	• Avoided Loss-of-Function Costs • Avoided Emergency Management Costs • Improved Emergency Response Capabilities	• Staff Time for coordination • $10k - $25K	High
2023.HMP.03– Continue to upgrade communications systems to ensure interoperability during a disaster.	• Improved Emergency Communications Capabilities • Avoided Emergency Management Costs • Avoided Casualties	• Equipment Costs ($1,000,000 for system upgrades) • Staff Time	Medium
2023.HMP.04- Purchase additional satellite phones to improve emergency communications	• Avoided Loss-of-Function Costs • Avoided Emergency Management Costs • Improved Emergency Response Capabilities • Avoided Casualties	• Equipment Costs ($25,000 for satellite) • Staff time	High
2023.HMP.05 – Purchase a 40-ton crane to increase EMWD s ability to respond to emergencies and maintain critical infrastructure.	• Avoided Loss-of-Function Costs • Improved Resiliency • Avoided Physical Damages	• Equipment Costs ($1,250,000/ unit)	Medium
2023.HMP.06 - Conduct an analysis of critical facilities to determine level of imperviousness to extreme weather events and utilize the maintenance schedule to make upgrades to improve resiliency	• Avoided Physical Damages • Improved vulnerability awareness • Avoided Loss-of-Function Costs • Avoided Emergency Management Costs	• Evaluation Costs • Maintenance Costs (???) • Administration/ Management Costs • Staff Time	Medium
2023.HMP.07 – Continue to include considerations for extreme weather (i.e., wind, high heat, excessive rain, etc.) events into new building planning documents	• Avoided Physical Damages • Avoided Loss-of-Function Costs • Improved building design for new facilities	• Staff Time	High
2023.HMP.08 – Continue assessments to elevate at-risk subterranean facilities to above grade locations and ensure future builds are assessed for risk.	• Avoided Physical Damages • Avoided Loss-of-Function. • Improved Resiliency • Avoided Emergency Management Costs	• Construction Costs ($10,000,000/ Project)	Low
2023.HMP.09- Identify facilities located within the updated dam inundation zones currently under development by Riverside County and implement mitigation projects as appropriate.	• Avoided Physical Damages • Avoided Loss-of-Function. • Improved Vulnerability Awareness • Avoided Emergency Management Costs	• Staff Time • Project Costs (potential project value unknown)	Low
2023.HMP.10 – Review and enhance infrastructure maintenance and monitoring schedules to increase the opportunity to identify and repair equipment prior to failure.	• Avoided Physical Damages • Avoided Loss-of-Function Costs • Improved Resiliency • Avoided Emergency Management Costs	• Staff Time	High
2023.HMP.11– Review brush clearance standards, particularly for facilities in fringe areas, and identify ways to expand clearance areas. Prioritize those facilities identified as being vulnerable to wildfire.	• Reduced vulnerability to wildfire. • Avoided Physical Damages • Improved standards for brush clearance	• Staff Time	Medium
2023.HMP.12 - Purchase emergency water tenders for use during wildfire/ seismic incidents	• Avoided Physical Damages • Improved Emergency Management Capabilities • Avoided Loss-of-Function Costs • Avoided Emergency Management Costs • Avoided Casualties	• Equipment Costs ($1,500,000/ unit)	Medium
2023.HMP.13 – Establish a Multi- hazard Response Emergency Response Team; Hazardous Materials, trench rescue, and elevated surface rescue	• Avoided Casualties • Avoided Emergency Management Costs • Avoided Physical Damages	• Training Costs ($250K/year)	High

Process

4.4 ELEMENT D. PLAN REVIEW, EVALUATION, AND IMPLEMENTATION *(Plan Updates Only)*

Requirement §201.6(d)(3)	A local jurisdiction must review and revise its plan to reflect changes in development, progress in local mitigation efforts, and changes in priorities, and resubmit if for approval within 5 years in order to continue to be eligible for mitigation project grant funding.

EMWD

Adoption by the local governing body validates the jurisdiction's commitment to fulfilling the hazard mitigation goals and actions outlined in the plan.

Adoption legitimizes the plan and authorizes responsible agencies to execute their responsibilities.

Updated plans also are adopted to demonstrate community recognition of the current planning process, changes that have occurred within the previous five years, and validate community priorities for hazard mitigation actions.

CAL OES

The Hazard Mitigation Plan is required to meet the requirements under the Code of Federal Regulations (CFR) Title 44 – Emergency Management and Assistance §201.6, Local Mitigation Plans for FEMA approval and eligibility to apply for FEMA Hazard Mitigation Assistance grant programs.

Once approved by CAL OES, the plan will be sent to FEMA for approval.

FEMA

FEMA will coordinate review process with the state. FEMA and the state my conduct joint review or FEMA may review after the state has completed their review.

Contact Information

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Safety and Emergency Management Officer
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Via: MS Teams

HAZARD MITIGATION PLAN TASKFORCE MEETING

June 20,2022

Meeting Summary	
Total Number of Participants	12
Meeting Title	Local Hazard Mitigation Plan Update - Taskforce
Meeting Start Time	6/20/2022, 11:16:51 AM
Meeting End Time	6/20/2022, 12:10:54 PM
Meeting Id	04f031ad-2bf3-432b-92f8-85bf06dd12b6

Full Name	Join Time	Leave Time	Duration	Email	Role	Participant ID (UPN)	MSTeams
[redacted]	6/20/2022, 11:16:51 AM	6/20/2022, 12:10:54 PM	54m 2s	[redacted]	Organizer	[redacted]	JB
	6/20/2022, 11:26:51 AM	6/20/2022, 12:02:32 PM	35m 41s		Participant		JJ
	6/20/2022, 11:26:58 AM	6/20/2022, 12:02:30 PM	35m 31s		Participant		JJ
	6/20/2022, 11:27:54 AM	6/20/2022, 12:10:52 PM	42m 58s		Participant		DB
	6/20/2022, 11:28:20 AM	6/20/2022, 12:02:31 PM	34m 10s		Participant		DG
	6/20/2022, 11:28:26 AM	6/20/2022, 12:02:29 PM	34m 2s		Participant		AC
	6/20/2022, 11:29:22 AM	6/20/2022, 12:02:31 PM	33m 8s		Participant		GB
	6/20/2022, 11:29:48 AM	6/20/2022, 12:02:30 PM	32m 42s		Participant		DA
	6/20/2022, 11:33:12 AM	6/20/2022, 12:02:29 PM	29m 17s		Participant		RT
	6/20/2022, 11:34:04 AM	6/20/2022, 12:02:32 PM	28m 28s		Participant		MM
	6/20/2022, 11:34:15 AM	6/20/2022, 12:02:40 PM	28m 25s		Participant		LA
	6/20/2022, 11:35:04 AM	6/20/2022, 12:01:06 PM	26m 1s		Participant		SS

E BENEFIT-COST ANALYSIS

Benefits can be classified as avoided damages and losses. To calculate the benefit of implementing mitigation recommendations, one would first calculate the likely damage without the mitigation action. Next, one would calculate the likely damage after the implementation of the mitigation recommendation. Then, the losses after mitigation are subtracted from the losses without mitigation to calculate net benefits. Finally, the useful life of the building and the time value of money (discount rate) are used to convert those average annual losses to their present value using the following Net Present Value (NPV) equation:

$$NPV = -M + B^*[(1-(1 + i)^{-T}) / i]$$

Where M is the cost of the mitigation measure, B is the net benefit (loss without mitigation - loss with mitigation), T is the useful life of the asset (50 years), and I is the interest rate to calculate the present-day value (7%).

The net benefits of mitigation are compared to the direct costs of implementing the mitigation action. This relationship is expressed as the ratio of benefits to costs.

Benefit / Cost = (NPV of expected benefit) / (mitigation cost)

A ratio of greater than 1.0 is considered a worthwhile mitigation investment.

Since the Benefit-Cost Analysis is an integral part of obtaining grant money from the Federal Emergency Management Agency (FEMA) for mitigation efforts, this appendix includes the requirements for classifying benefits for select mitigation projects, include FEMA's *What is a Benefit* and *Using Benefit-Cost Review in Mitigation Planning*.

WHAT IS A BENEFIT?

GUIDANCE ON BENEFIT-COST ANALYSIS

OF HAZARD MITIGATION PROJECTS

DRAFT

REVISION 2.0

(Supersedes Revision 1.0)

Federal Emergency Management Agency
Flood Insurance and Mitigation Administration
500 C Street, SW
Washington, DC 20472

May 1, 2001

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There is little doubt that flood-proofing a school, installing hurricane shutters on a beachside home, or seismically retrofitting a heavily-traveled bridge can bring substantial benefits to a community. Reducing the risk of damage from a natural disaster has the potential to save lives, significantly lower cleanup and recovery costs, and minimize the amount of time it takes for a community to return to normal among many other benefits.

While it may seem clear that activities that reduce the damage caused by natural disasters would bring a host of benefits, it is far less obvious how we would actually categorize and quantify these benefits. What kinds of benefits *do* activities like flood-proofing a school or upgrading a drainage channel provide? The purpose of this analysis is to help answer this question by identifying the benefits associated with hazard mitigation projects; demonstrating ways to quantify benefits for use in the benefit-cost analysis (BCA) of hazard mitigation projects; and presenting several applied examples of calculating the benefits of mitigation.

1.1 What is Mitigation?

Mitigation is an action taken specifically to reduce ***future*** damages and losses from natural disasters. Most Hazard Mitigation Grant Program (HMGP) mitigation projects are construction projects that are designed to avoid or reduce damages to buildings or infrastructure in future disasters. In addition to reducing damages to a facility or building structure, many mitigation projects also reduce the broader negative impacts that disasters have on affected communities, such as the economic effects of regional loss of power.

Examples of common mitigation projects include:

Acquiring flood-prone structures to remove them from the floodplain,

Elevating flood-prone structures,

Improving storm water drainage systems,

Adding hurricane shutters to improve building wind resistance,

Strengthening buildings or infrastructure to resist earthquakes, and

Bracing building contents to resist earthquakes.

Mitigation projects may also include education programs, publications or videos, building code enhancements, and mitigation planning activities, but only if such projects demonstrably result in actions which reduce future damages and losses. These types of "soft" mitigation projects are sometimes excluded by FEMA policies or priorities and are generally more difficult to evaluate than the more common types of "hard" mitigation projects listed above.

Mitigation is conceptually distinct from repair of damaged facilities. After disasters, many damaged facilities are simply repaired to their pre-disaster condition. Such repair actions are not mitigation because they do not reduce the potential for future damages and losses. However, after a disaster some projects may include both repair and mitigation. In this case, the costs of repair and mitigation must be separated. The guidance for benefit-cost analysis in this document applies only to mitigation projects, or only to the mitigation portion of projects that include both repair and mitigation elements.

1.2 What are Benefits?

The benefits of a mitigation project are the elimination and/or reduction of future damages and losses. In other words:

Benefits are simply avoided damages and losses.

For every mitigation project, benefits are calculated by estimating future damages and losses under two circumstances: with and without undertaking the mitigation project. As a simple example, consider a mitigation project to elevate a single flood-prone residential structure. Assume that future damages and losses for this home are estimated as $5,000 per year for the as-is situation (without mitigation). After elevation, future damages and losses are estimated as $500 per year. In this example, the benefits of the mitigation project are $4,500 per year. The $4,500 in annual benefits is calculated as the difference in estimated future damages and losses before and after mitigation ($5,000 minus $500).

For benefit-cost analysis, much of the effort is focused on estimating damages and losses. This focus on damages and losses is sometimes confusing to novices. However, as illustrated by the example above, mitigation project benefits can only be calculated by estimating damages and losses both before and after the mitigation project and then taking the difference between the two.

There are two aspects of counting benefits that are particularly important to keep in mind when conducting benefit-cost analyses of mitigation projects. First, mitigation projects reduce future damages and losses, but generally do not completely eliminate future damages and losses. Acquisition is the only type of mitigation project that completely eliminates future damages and losses. All other mitigation projects reduce future damages and losses but do not completely eliminate them. For example, mitigation projects to elevate structures for floods or to strengthen structures for hurricanes or earthquakes may greatly reduce future damages, but some level of damages will still occur, especially in major disasters. Thus, except for acquisition projects, it will always be necessary to estimate damages and losses after mitigation.

Second, for every mitigation project, the greater the damages and losses are before mitigation, the greater are the potential benefits.

For example, if damages before mitigation are estimated as $10,000 per year for one house and only $500 per year for another house, then the maximum possible benefit for the first house is $10,000 per year and only $500 per year for the second house. The maximum level of benefit can be achieved only if the estimated damages and losses are completely eliminated by a mitigation project (i.e., by acquiring and demolishing the house). The relationship between damages and losses before mitigation and the maximum possible benefit achieved after mitigation is very important. The best mitigation projects are often those where the damages and losses are greatest before mitigation is undertaken. In other words, the greater the damage and losses are prior to mitigation project, the greater the potential benefits of mitigation. Conversely, when the damages and losses before mitigation are minor, the maximum possible benefits are limited. This relationship is very important for mitigation planning. Mitigation projects providing the highest level of benefit can be identified simply by finding the structures or facilities with the highest risk for future damages and losses.

1.3 What Benefits Should Be Counted?

The goal of FEMA's hazard mitigation program is to reduce the impacts of natural disasters on affected communities. In this context, it is very important to note:

The benefits considered in benefit-cost analysis are the benefits to the community, not just the benefits to FEMA or the federal government. The Office of Management and Budget (OMB) Advisory Circular A-94 (Guidelines and Discount Rates for Benefit-Cost Analysis of Federal Programs) provides explicit guidance on what benefits to count:

> *Analyses should include comprehensive estimates of the expected benefits and costs to society based on established definitions and practices for program and policy evaluation. Social net benefits, and not the benefits and costs to the federal government, should be the basis for evaluating Government programs or policies that have effects on private citizens or other levels of Government.*

This OMB guidance means that benefits must always be counted from the perspective of the affected community, not from the perspective of FEMA or the federal government. Thus, for benefit-cost analysis of hazard mitigation projects, a broad range of benefits may legitimately be counted, even if Federal programs do not address actually compensate for the damages when they occur.

Some of the benefits to be counted are covered by government programs. Examples of such benefits include avoided damages to public buildings or infrastructure, and emergency management costs (including debris removal) which may be covered under the Public Assistance Program. Other damages and recovery costs may be partially covered by government programs. Examples include avoided damages to private residences and displacement costs for temporary housing, which may be

partially covered under FEMA's Individual and Family Grant Program. Other damages, such as deaths and injuries, do not involve any real exchange of money and are not compensated by any government program. Regardless of whether government agencies actually compensate the damages and losses, the OMB guidance directs Federal agencies such as FEMA to count the full direct benefits of hazard mitigation projects. As an example, consider a city hall building damaged in an earthquake. Federal programs may reimburse the city for damages to the city hall and contents, for cleanup costs, and add something else that FEMA would cover or delete, but the Federal government does not provide life insurance for occupants of public buildings. From a community perspective, however, casualties from the earthquake are obviously a major negative effect of the disaster, and hence it is correct and necessary to count the casualties as damages.

The goal of benefit-cost analysis of hazard mitigation projects is always to count ***all*** of the benefits of each mitigation project whether or not the categories of benefits are covered by FEMA programs or programs of other federal agencies.

The broad categories of benefits to be counted are summarized in Section 1.4 below.

1.4 Categories of Benefits

Mitigation projects may be undertaken to reduce the extent of damage from natural disaster for a wide variety of facilities. Mitigation projects may apply to private residential and commercial buildings as well as many types of public buildings from city halls and schools, hospitals, to more specialized buildings providing medical, police, or fire services. Mitigation projects may also cover utilities providing electric power, water and other services as well as a wide range of infrastructure from drainage systems, to roads and bridges, to dams and other specialized structures.

The specific benefits to be counted for each mitigation project depend on the type of facility covered by the mitigation project. Different benefits may be counted for different types of projects. However, conceptually, most of the benefits to be counted for any mitigation project can be sorted into four main categories, as summarized below in Table 1.1.

Table 1.1 Categories of Avoided Damages

Avoided Physical Damages	▪ Buildings ▪ Contents ▪ Infrastructure ▪ Landscaping ▪ Site Contamination ▪ Vehicles ▪ Equipment
Avoided Loss-of-Function Costs	▪ Displacement costs for temporary quarters ▪ Loss of rental income ▪ Loss of business income ▪ Lost wages ▪ Disruption time for residents ▪ Loss of public services ▪ Economic impact of loss of utility services ▪ Economic impact of road/bridge closures
Avoided Casualties	▪ Deaths ▪ Injuries ▪ Illnesses
Avoided Emergency Management Costs	▪ Emergency operations center costs ▪ Evacuation or rescue costs ▪ Security costs ▪ Temporary protective measure costs ▪ Debris removal and cleanup costs ▪ Other management costs

These categories are briefly described below and are discussed more fully in Section 2 of this report. Examples, case studies and guidance on how to count each type of benefit are provided in Sections 3 and 4.

Physical damages are probably the easiest category of damages and losses and benefits to understand. Buildings, contents, infrastructure, landscaping, vehicles and equipment are damaged by a flood or other disaster event. The monetary damages are simply the cost to repair or replace the damaged property. For physical damages, benefits are simply the avoided damages; that is, the reduction in future damages attributable to a mitigation project.

Loss of function economic impacts are losses and costs that are incurred when facilities are damaged to the point that the normal function of the facility is disrupted. Many loss-of-function economic impacts are extra costs incurred by occupants of damaged buildings. For example, occupants of residential, commercial or public buildings may incur displacement costs for temporary quarters when damage levels render buildings unoccupiable after a disaster. The loss of function of buildings may also result in other direct economic impacts to occupants such as loss of rental income, loss of business income, or lost wages as well as disruption time (time spent in cleanup, repair, and replacement of damaged property and so on).

In addition, loss of function of some types of facilities may have negative impacts on the community as a whole. For public buildings, loss of function also means loss of the public service provided from the building; such loss of public service has a direct impact on the community. Similarly, loss of utility or transportation services may have large direct economic impacts on affected communities as a whole.

Mitigation projects that reduce physical damages to buildings and other facilities also reduce the loss of function of the facilities, so benefits from mitigation projects often include reducing loss-of-function impacts. The types of reduced loss-of-function benefits to be counted vary, depending on the type of facility, but these benefits can be large and important to count in benefit-cost analysis. For some types of mitigation projects, especially for utilities, roads, bridges, and critical facilities such as hospitals, the benefits of avoiding the loss-of-function impacts are *always* important and may be larger than the benefits of avoiding physical damages. Indeed, many mitigation projects for these types of facilities are undertaken primarily to preserve the critical function of the facility, with reduction of physical damages being an important, but secondary consideration.

> **For important community operations, loss of function is often the most severe impact of a hazard event, so it is critically important to correctly count the losses and the benefits of avoiding some or all of them.**

Casualties include deaths, injuries and illnesses. For some types of mitigation projects, such as seismic retrofit of buildings, reducing casualties is often the main reason a project is undertaken. Whenever a specific mitigation project demonstrably reduces the future potential for casualties, it is proper and necessary to count the benefits of reduced casualties.

Emergency management costs include a range of disaster response and recovery costs that may be incurred by communities during and immediately after a disaster. In many disasters, these costs are much smaller than physical damages or loss-of-function economic impacts. Furthermore, many common mitigation projects have little or no significant impact on a community's emergency management costs. However, in circumstances where a project affects a large part of a community and may significantly reduce future emergency management costs; counting the benefits of reduced emergency management costs is proper. For most projects, however, the benefits in this category are

negligible or very small. Thus, in most cases it may not be necessary to make the effort to estimate the benefits of reduced emergency management costs. In cases where a project has a benefit-cost ratio very close to 1.0 and has significant potential benefits in reducing future emergency management costs, it may be worthwhile to calculate the damages from this source, and the benefits of reducing or eliminating them.

1.5 What Benefits Cannot Be Counted?

As summarized above, the intent of benefit-cost analysis is to count all benefits for each hazard mitigation project, whether or not FEMA or other Federal government programs cover the benefit category. . However, OMB Circular A-94 does place one important limit on the types of benefits than can be counted. In simple terms, the OMB guidance is to NOT count indirect or secondary benefits. The technical language in Circular A-94 is:

> *Employment or output multipliers that purport to measure the secondary impacts of government expenditures on employment and output should not be included in measured social benefits or costs*

In simpler terms, this means that the possible impact of a mitigation project on local or regional employment or on overall economic output or economic activity should not be counted. Therefore, changes in employment levels, economic growth or development, tourism, or future tax revenues should not be considered in benefit-cost analysis.

The focus of OMB guidance on benefit-cost analysis is thus to count direct benefits; that is, to count the damages and losses that would be incurred in the future if the mitigation project were not completed. Such direct benefits include: avoided physical damages, avoided loss-of-function costs incurred by the affected community, avoided casualties, and avoided emergency management costs. Other, more indirect or secondary impacts should not be counted.

This policy guidance from OMB applies to FEMA and to all other federal agencies that do benefit-cost analysis except for the U.S. Army Corps of Engineers (USACE). USACE benefit-cost analysis of projects for navigable waterways is separately mandated by legislation to include a broader range of long-term regional economic impacts, reflecting the large scale and long-term regional economic impact of many Corps projects. Thus, USACE benefit-cost analysis may include benefits that are not countable for most other Federal benefit-cost analysis.

Detailed guidance on what direct benefits to count for particular types of projects, with examples and case studies are given later in this report.

1.6 What is Benefit-Cost Analysis?

Benefit-cost analysis is a standardized, systematic way to count the benefits of a mitigation project and to compare these benefits to the costs of mitigation. A complete benefit-cost analysis counts ***all*** of the significant direct benefits of a mitigation project.

A benefit-cost analysis always involves looking at damages and losses twice: first, before mitigation (the as-is situation) and second, after mitigation. The benefits of a mitigation project are simply the difference in expected damages and losses before and after the mitigation project are completed.

In more technical detail, a benefit-cost analysis also takes into account:

1. The probabilities of various levels of natural hazard events and damages
2. The useful lifetime of the mitigation project
3. The time value of money (the discount rate)

As a quick review, the underlying principles of benefit-cost analysis are illustrated by one simplified example. Consider a mitigation project to elevate a single flood-prone residential structure. Annualized damages are calculated for each flood depth by estimating each damage category and then taking into account the annual probability of each flood depth. First, annualized damages are estimated before mitigation by combining the probability of each level of flooding with the estimated damages and losses at each flood depth. For a residential structure, the damages considered typically include building damages, damages to contents, and displacement costs for temporary housing (refer to Table 1.2).

Table 1.2
Example Showing Principles of Benefit-Cost Analysis
Damages Before Mitigation

Flood Depth (feet)	Annual Probability of Flooding	Scenario Damages and Losses (per flood event)	Annualized Damages and Losses
0	0.2050	$6,400	$1,312
1	0.1234	$14,300	$1,765
2	0.0867	$24,500	$2,124
3	0.0233	$28,900	$673
4	0.0098	$32,100	$315
5	0.0034	$36,300	$123
Total Annualized Damages and Losses (Before Mitigation)			**$6,312**

In the Table 1.2, the scenario damages (damages per flood event) increase with increasing flood depth in the home, as expected. However, the annualized damages, which also take into account the probability of flooding, are lower at high flood depths because such floods are very infrequent at this site.

The total annualized damages and losses, $6,312 in the above example, indicates the level of risk faced by the property. The greater the frequency and depth of flooding for a given home, the higher the annualized damages and losses. To the extent that a mitigation project reduces or eliminates these damages and losses, the greater the potential benefits of the mitigation project.

For benefit-cost analysis, a similar calculation is done after mitigation, and then benefits are calculated as the difference between annualized damages with and without undertaking the mitigation project (as shown in Table 1.3).

Table 1. 3
Example Showing Principles of Benefit-Cost Analysis
Summary Calculation

Flood Depth (feet)	Before Mitigation Annualized Damages (from Table 1.2)	After Mitigation Annualized Damages	Annualized Benefits (Avoided Damages) "Before Mitigation" – "After Mitigation"
0	$1,312	$0	$1,312
1	$1,765	$0	$1,765
2	$2,124	$0	$2,124
3	$673	$0	$673
4	$315	$63	$252
5	$123	$49	$74
Totals	**$6,312**	**$112**	**$6,200**
Present Value Coefficient (7% discount rate, 30 year project lifetime)			12.41
Net Present Value of Future Benefits			$76,942
Mitigation Project Costs			$20,000
Benefit-Cost Ratio (Net Present Value of Future Benefits ÷ Project Costs)			**3.85**

In this example, the annualized benefits are calculated as the difference in the annualized damages before and after mitigation. The benefits of this mitigation project are assumed to occur over a 30-year useful lifetime of the mitigation project. To compare this future stream of statistical (probabilistic) benefits to the present cost of the mitigation projects, a present value calculation is done. The present value calculation depends on the project useful lifetime and on the discount rate that accounts for the time value of money. For FEMA projects, the discount rate is specified by OMB Circular A-94 as 7%. The present value coefficient, which depends on the project useful lifetime and the discount rate, is a multiplier that converts the annualized benefits to net present value.

In this example, the annual benefit of $6,200 corresponds to a net present value of benefits of $76,942. The benefit-cost ratio of 3.85 indicates that the benefits are 3.85 times the costs. In other

words, for each dollar spent on mitigation there is an expected return of $3.85 in reduced damages and losses.

1.7 Why Does FEMA Do Benefit-Cost Analysis?

There are four primary reasons why FEMA does benefit-cost analysis of hazard mitigation projects:

1. To meet the statutory and regulatory requirement eligibility requirement, as specified in the Stafford Act and in 44 CFR. To be eligible for FEMA funding under the HMGP or Flood Mitigation Assistance (FMA) program, each mitigation project must be shown to be cost-effective. As defined in the regulations, cost-effective means that the benefits of each project must exceed the costs (i.e., that the benefit-cost ratio exceeds 1.0).
2. To determine whether or not a mitigation project is worth doing.
3. To provide a common basis with which to compare and prioritize mitigation projects and to help ensure that limited mitigation funds result in the greatest possible reduction in future damages and losses.
4. To demonstrate that mitigation works. Benefit-cost analysis can be a powerful tool to help sell the concept of mitigation and to convince individuals and communities that mitigation investments are in their own self interest. For the HMGP and FMA program overall, benefit-cost analysis helps to demonstrate that the programs and their actions are fiscally sound.

The statutory and regulatory basis of FEMA's benefit-cost analyses is outlined in the Stafford Act and in the program regulations in the Code of Federal Regulations.

1.7.1 The Stafford Act

FEMA's disaster assistance activities, including the HMGP, are enabled by the Robert T. Stafford Disaster Relief and Emergency Assistance Act. The intent and purpose of the Stafford Act is spelled out in Section 102 (2):

> *to supplement the efforts and available resources of States, local governments and disaster relief organizations in alleviating the damage, loss, hardship, or suffering caused by major disasters.*

Hazard mitigation activities, which by their nature are designed to alleviate the damage, loss, hardship, and suffering caused by natural disasters, are addressed in Section 404 of the Stafford Act:

> *The President may contribute up to 50 percent of the cost of hazard mitigation measures which the President has determined are cost-effective and which substantially reduce the risk of future damage, hardship, loss, or suffering in any area affected by a major disaster.*

1.7.2 44 CFR, Emergency Management and Assistance

The requirement that each mitigation project must be cost-effective is described in Section 44 206.434 Eligibility (Code of Federal Regulations, 44 Emergency Management and Assistance, Revised as of October 1, 1998). Section 206.434 specifies the eligibility requirements for Hazard Mitigation Program Grants:

> *"(b) Minimum project criteria. To be eligible for the Hazard Mitigation Grant Program a project must:*
>
> *(5) Be cost effective and substantially reduce the risk of future damage, hardship, loss, or suffering resulting from a major disaster. The grantee must demonstrate this by documenting that the project;*
>
> > *(i)Addresses a problem that has been repetitive or a problem that poses a significant risk to public health and safety if left unsolved,*
> >
> > *(ii) Will not cost more than the anticipated value of the reduction in both direct damages and subsequent negative impacts to the area if future disasters were to occur. Both costs and benefits will be computed on a net present value basis,*
> >
> > *(iii) Has been determined to be the most practical, effective and environmentally sound alternative after consideration of a range of options,*
> >
> > *(iv) Contributes, to the extent practicable, to a long-term solution to the problem it is intended to address,*
> >
> > *(v) Considers long-term changes to the areas and entities it protects, and has manageable future maintenance and modification requirements.*

The goal of benefit-cost analysis of hazard mitigation projects is always to count the benefits of each mitigation project whether or not the categories of benefits are covered by FEMA programs or programs of other federal agencies.

The OMB Guidance to count the social net benefits, not only the benefits to the federal government, also applies on the cost side of benefit-cost analysis. Thus, it is always the total cost of the project

that is included in the analysis, not the FEMA share of the cost. For example, consider a mitigation project with a total cost of $500,000 and calculated benefits of $300,000 (i.e., a benefit-cost ratio of 0.60). This project fails the cost-effectiveness criterion. From the perspective of the community as a whole, the benefits are less than the cost of the project. This conclusion does not depend on what fraction of the project is FEMA funded, even if FEMA funds less than $300,000 of the project cost, because the OMB guidance for benefit-cost analysis requires the entire project be cost-effective in order to be eligible for funding.

As discussed in Section 1, the benefits of mitigation projects are future damages and losses avoided by undertaking the mitigation project. Damages and losses become benefits when they are avoided by a mitigation project. This section describes the major categories of damages and losses estimated before and after mitigation; the estimates of damages and losses are then used to calculate the benefits of avoided such damages and losses.

In most cases, FEMA's goal is to count fully all of the benefits of each mitigation project. There are four major categories of benefits:

1. Avoided physical damages
2. Avoided loss-of-function impacts
3. Avoided casualties,
4. Avoided emergency management costs

A brief summary of how to count each of these four categories is provided in this section.

2.1 Avoided Physical Damages

Physical damages are the most direct kind of damages and usually are the easiest to count. Physical damages are simply the costs to repair or replace damaged facilities, including buildings, building contents, and infrastructure. Physical damages may also include repair or replacement costs for landscaping, site contamination restoration, vehicles, and equipment. The most common sub-categories of avoided physical damages are:

Buildings

Contents

Infrastructure

Landscaping

Outbuildings

Site Contamination

Vehicles

Equipment

Physical damage estimates (before and after mitigation) are expressed in dollars. For benefit-cost analysis of hazard mitigation projects, damages are often expressed as a percentage of the replacement value of the damaged element (e.g., a building, the contents of a building, a utility component or a bridge). Damage functions are used to express the percentage damage expected as a

function of flood depth for floods, wind speed for hurricanes or level of ground shaking for earthquakes.

For buildings and infrastructure, facilities are generally deemed a complete loss and replaced rather than repaired whenever the damage percentage exceeds a value known as the demolition threshold. For buildings, a 50% demolition threshold is often assumed. For outdated or marginal buildings, much lower demolition thresholds are sometimes appropriate. Similar concepts apply to infrastructure damages.

Guidance for evaluating physical damages is summarized below in Table 2.1. FEMA has developed typical or default damage functions that express the expected percentage damage for buildings and contents. These damage functions are most useful for ordinary residential, commercial or public buildings and may have to be modified for more specialized buildings, using historical damage data, professional judgment, or both.

There are no typical or default damage functions available for estimating the other sub-categories of physical damages. For these categories, historical data and professional judgment are used to make damage estimates.

Table 2.1
Summary Guidance for Physical Damage Estimates

Type of Facility	Level of Technical Expertise Required	Typical Data Sources
Residential buildings	Low	Historical damage data Professional judgment
Commercial buildings	Low	Historical damage data Professional judgment
Public buildings	Low	Historical damage data Professional judgment DSRs if available
Specialized buildings for police, fire, and medical facilities	Moderate	Historical damage data Professional judgment Default damage functions may need to be adjusted
Contents, ordinary or specialized buildings	Low to moderate	Historical damage data Professional judgment

Type of Facility	Level of Technical Expertise Required	Typical Data Sources
Infrastructure (including utility and transportation elements)	Moderate to high	Historical damage data Specialized engineering experience with these type of facilities is essential
Landscaping damages and yard cleanup	Low to moderate	Historical data Professional judgment
Site contamination restoration	Moderate to high	Historical data Specialized engineering experience helpful
Vehicles and equipment	Moderate to high	Historical data Professional judgment

2.2 Loss-of-Function Impacts

The negative impacts of a disaster on a community often go far beyond the physical damages alone. Loss-of-function impacts are the losses, costs and direct economic impacts that occur when physical damages are severe enough to interrupt the function of a building or other facility. For a building, loss-of-function impacts may include the costs for temporary quarters while repairs are made, as well as losses in rental income, business income, or public services provided from the building. For utilities, loss of function means a loss of service or a reduction in the level of service. For a road or bridge, loss of function means closures of a road or bridge, or delays arising from a reduction in traffic capacity of a damaged road or bridge.

Loss-of-function impacts are sometimes as important as or even more important than the direct physical damages. For example, the loss of function of a hospital or fire station or other facility critical to the emergency response and recovery during and immediately after a disaster may have a much greater economic impact on the community than simply the repair costs for the physical damages. Similarly, loss of electric power or potable water service has a much larger economic impact on a community than simply the costs to repair damage to the electric power or water systems. Thus, to fully count the benefits of each hazard mitigation project it is very important to count all of the benefits of avoiding loss-of-function impacts.

The type of loss-of-function impacts to be counted varies depending on the type of facility under evaluation. Some of the sub-categories of loss-of-function impacts are somewhat more difficult to understand and to calculate than the more self-evident physical damage sub-categories. As a result, loss-of-function impacts have often been only partially counted or not counted at all when conducting benefit-cost analyses of hazard mitigation projects. Undercounting loss-of-function impacts is a serious error that may result in highly meritorious and highly cost-effective mitigation projects being improperly rejected. The most common sub-categories of loss-of-function impacts are:

- Displacement costs for temporary quarters

  Loss of rental income

  Loss of business income

  Lost wages

  Disruption time for residents

  Loss of public services

  Economic impact of loss of utility services

  Economic impact of road/bridge closures

2.2.1 Displacement Time and Functional Downtime

Estimating loss-of-function economic impacts for a building or other facility always requires two steps. First, the time duration of the interruption of function must be estimated, and second, the economic value per unit time of interruption of service must be estimated.

For purposes of benefit-cost analysis, displacement time and functional downtime must be considered. **Displacement time** is the time period during which occupants are displaced from a building so repairs can be made. For low levels of damage, displacement time is generally zero; that is, minor repairs can be made without displacing occupants. **Functional downtime** is the time period during which services are lost.

Functional downtime may be much shorter than displacement time. For example, consider a city hall building that is badly damaged in a disaster. The occupants of the building may be displaced to temporary quarters for six months - this is the displacement time. Displacement costs are estimated from the displacement time and the daily or monthly cost of displacement. However, in this simple example, the functional downtime is much less than six months. If the services are re-established in the temporary quarters in two weeks, then the functional downtime is only two weeks, not six months.

Functional downtime can also be fractional. One day of functional downtime can be one day of complete loss of service, or two days of 50% loss of service, or 10 days of 10% loss of service, and so on.

For utility and transportation systems, there are generally no displacement costs because such service generally can't simply be moved to temporary quarters. Thus for these systems the loss-of-function economic impacts are calculated from the estimated functional downtime and the value of the service per day.

2.2.2 Loss-of-Function Impacts for Buildings

For buildings, loss-of-function impacts may include the following categories: displacement costs, loss of rental income, loss of business income, loss of wages, loss of public services, and disruption time.

Displacement costs are the extra costs incurred when occupants of a building are displaced to temporary quarters. Displacement costs may be incurred for residential, commercial, or public buildings. Displacement occurs only when damages to a building are sufficiently severe that the building cannot be repaired with occupants in place. At lower levels of damage, repairs are commonly made with occupants remaining in the building during the repair process.

Displacement costs include the following sub-categories of costs:

1. Rental costs for temporary quarters
2. Other monthly costs of displacement such as furniture rental, other costs of being in temporary space, extra commuting costs, etc.
3. One-time costs such as utility hookup fees, round-trip moving costs, etc.

Displacement costs are the most commonly counted loss-of-function impact. The necessary data is straightforward and relatively easy to obtain. Rental costs for temporary quarters can be obtained from local officials or real estate firms. Estimates for other monthly costs and one-time moving costs can be provided by applicants or estimated using common sense.

Rental income losses are incurred by owners when tenants vacate premises because of damages, resulting in a loss of rental income for the owner. Rental income losses may apply to any building that is rented (residential, commercial, or public).

Analysts should be aware of the potential for double-counting rental income losses. Consider an example where two homes are damaged by floods and the occupants are displaced to temporary quarters for several months while repairs are made. If one home is owner-occupied, the owner is still responsible for mortgage and tax payments on the home in addition to paying rent and other expenses

for temporary quarters. In this case, the full displacement costs for temporary quarters are additional expenses and should be counted. However, for a rented home, the economics are different. If a renter is displaced to temporary quarters, then he/she no longer pays rent for the damaged facility. This loss of rental income is a loss to the owner and may be counted as part of the loss-of-function impacts for the building. However, in this case, the displacement costs for the renter must be adjusted to consider only the possible increase in rent above the previous rent, rather than the total cost of rent at the temporary quarters. Counting the displacement costs for the renter and the full loss of rental income for the owner is double-counting and must be avoided.

The simplest way to avoid potential double-counting is to not count rental income losses. If this is done, then the full displacement costs should be counted for both owners and renters. Counting the full displacement costs for renters, does, in effect, count the lost rental income. This approach has the additional advantage that it is no longer necessary to determine whether occupants of buildings are owners or renters.

Loss of business income may occur for commercial buildings when damage is severe enough to result in temporary loss of function of a building. For benefit-cost analysis, the proper measure of loss of business income is the net income, not the gross income since expenses as well as receipts are lower when a business is closed.

Estimates of net business income losses can generally be obtained from applicants, the owners, or local officials. In making estimates of net business income losses, it is important to remember that some lost business income can be made up. For example, a business that is closed for two weeks because of hurricane damage does not necessarily lose two weeks of net business income. In many cases, some of the lost sales or income will be made up after the business reopens.

FEMA considers relatively few mitigation projects for commercial buildings. In most cases, the loss of business income constitutes only a very small fraction of total damages and losses. Thus, the benefits of avoiding or reducing loss of business income are generally only a small fraction of total damages and losses. For projects that are clearly cost-effective, it may not be necessary to consider business income losses to demonstrate cost-effectiveness. However, to count fully the benefits of hazard mitigation projects for commercial buildings, it is necessary to consider loss of business income.

Loss of wage income may also occur for commercial buildings, when damage is severe enough to result in temporary loss of function of a building. When a business closes temporarily due to damages, loss of wages for employees is analogous to the loss of business income for the owner. Historically, loss of wage income has not been considered in FEMA's benefit-cost analysis. In economic theory, wages are considered fungible, that is, movable or transferable, and it is commonly assumed that wage earners who lose one job find another. However, since loss of wages due to

disaster damage is short-term and not predictable, the assumption of fundability does not appear to apply.

The intent of the Stafford Act is to alleviate the "damage, loss, hardship, and suffering" caused by major disasters. In this context and for consistency with regard to counting losses in net business income, counting loss of wage income is appropriate for benefit-cost analysis of hazard mitigation projects. For purposes of benefit-cost analysis, wage income losses to be counted are only short-term losses due to temporary business closes. The wage losses to be counted are primarily those for hourly workers. Wage losses for salaried workers should not be counted unless these workers are also laid off without pay. Wage losses should be counted as business income losses only to the extent that they are not likely to be made up later after the business reopens.

Situations where a business may leave town with permanent loss of wages (if, for example, some flood protection improvements are not made) should not be counted because such impacts fall under the type of secondary impacts on employment or output that are excluded from consideration under OMB guidance.

Loss of wages for public employees should not be counted for two reasons: 1) most public employees are likely to continue to receive wages during and after disasters, and 2) the value of public sector wages is already included in evaluating the loss of public services.

Loss of hourly wages due to temporary business closures due to disaster damage should include the full value to employees, wages plus benefits. Local data on wages and benefits are generally available from local officials. If not, national average data may be used. As discussed in Section 7 of this report (Roads and Bridges), the current national average for wages and benefits is $21.16 per hour.

Economic value of disruption time for residents is the value of lost time incurred by residents for pre-disaster preventative measures, evacuation time, cleanup and repair of flood damages, replacement of damaged property, dealing with insurance claims and other disaster-related matters. The key economic concept is that personal time has value, whether or not the time is formally compensated by employment. Outlined below is an approach closely analogous to that adopted by the U.S. Department of Transportation (DOT) in calculating the benefits of reducing travel time delays. The simplest assumption consistent with economic theory is that each hour of time is worth the same amount, whether such time is personal or business, compensated or not. In other words, the last hour of work time and the first hour of leisure time are assumed to have equal value. This is the assumption suggested in Section 7 (Roads and Bridges) for placing a value on delay or detour times due to closures of roads and bridges. The same economic principles apply to personal time lost due to disaster damages to residential structures. Placing an economic value on personal disruption time is consistent with the DOT's approach and with the intent of the Stafford Act to alleviate the "damage, loss, hardship, and suffering" caused by major disasters.

The economic value of disruption time for residents is estimated at $21.16 per hour, the national average value for wages and benefits.

Loss of Public Services may occur for public buildings when damage is severe enough to result in temporary loss of function of the building. For purposes of benefit-cost analysis, private non-profit organizations providing what are essentially public services (e.g., the Red Cross, schools, and hospitals) are evaluated in exactly the same manner as public buildings. For commercial buildings, the loss of net business income is a measure of the economic impact of loss of function of the building. For public buildings, the measure of the economic impact of loss of function is the value of the services provided to the community by the agencies operating in the building.

To value public services, FEMA makes the very simple and direct assumption that public services are worth what it costs to provide the services to the public. For example, if a public service costs $1,000 per day to provide, then the value is assumed to be $1,000 per day. If the service is lost because of damage to the building, the loss is assumed to be $1,000 per day. If the loss of service is avoided because of a hazard mitigation project, then the benefit is assumed to be $1,000 per day.

The daily cost of services is estimated from the annual operating budget for the agencies occupying a building. The annual operating budget includes all of the direct costs necessary to provide the public services, including salaries and benefits, materials, supplies, utilities, equipment costs, and rent or the annual cost of owning the building. The only exclusion is for transfer payments. For example, if a public office distributes pension checks, the value of the service is not the value of the checks distributed, but rather the cost of providing the service.

This method for valuing the loss of public services applies to all public services, including administrative functions, schools, as well as more specialized services such as public works, police, fire and medical services. For ordinary (non-disaster related) public services, the annual operating budget is used directly as a proxy to determine the daily value of services to the community. For services which are essential to immediate disaster response and recovery, a continuity premium is added to reflect the greater impact of losing services when they are most in demand and most critical to the community.

The continuity premium is a multiplier on the normal daily cost of service that is applied only to services, such as police, fire and medical that are directly related to emergency response and recovery. The continuity premium reflects the greater demand for such services during disasters and, in effect, is an estimate of how much more than the normal cost a community would be willing to pay to maintain these services during disasters. Determining an appropriate continuity premium for public services that are critical to disaster response and recovery is difficult and requires a great deal of judgment and experience. Guidance on appropriate continuity premiums for police, fire, and hospital services is given in Section 4 of this report. Guidance on appropriate continuity premiums for emergency operations centers and emergency shelters is given in Section 5 of this report.

2.2.3 Economic Impact of Loss of Utility Services

Utility services such as electric power, potable water, and wastewater are often referred to as "lifelines" because these utility services are so critical to the functioning of modern cities. Mitigation projects for utilities are often motivated primarily by the desire to maintain function of these critical services. The economic impacts of loss of utility services are generally many times larger than the physical damages alone. For example, loss of electric power affects not only the utility itself but impacts economic activity in the entire community.

Since the loss-of-function impacts (economic impact of loss of utility services) for utility systems are almost always much larger than physical damages alone, benefit-cost analysis for utility systems must always include loss-of-function impacts. Because of the complex, technical nature of most utility systems, evaluating mitigation projects for these systems usually requires specialized expertise.

Detailed technical guidance on how to evaluate mitigation projects for electric power, potable water, and wastewater utility systems is given in Section 6 of this report. The economic impacts of loss of utility services are calculated by first estimating the functional downtime (i.e., the time period for which utility service is lost), then the per capita economic impacts per day of lost service are estimated by the summing the impact of lost service on local economic activity and the economic impacts on residents, and finally, the economic impact of loss of utility services is calculated as the product of the functional downtime and the economic impact per day of lost service.

2.2.4 Economic Impact of Road and Bridge Closures

Roads and bridges, like utilities, are commonly considered lifelines for communities because they are so critical to the functioning of modern cities. Mitigation projects for roads and bridges are often motivated primarily by the desire to maintain function of these critical transportation system links. The economic impacts of road and bridge closures are often many times larger than the physical damages alone.

Since the loss-of-function impacts for roads and bridges (economic impact of road and bridge closures) are often larger than physical damages alone, benefit-cost analysis for hazard mitigation projects must always include the loss-of-function impacts.

Detailed technical guidance on how to evaluate mitigation projects for roads and bridges is given in Section 7 of this report. The economic impacts of road and bridge closures are calculated by first estimating the functional downtime (i.e., the duration of road or bridge closures), then, calculating the number of person hours of delay or detour time from the daily traffic volume and the expected

duration of delays or detours, and finally, calculating the economic impact using the number of person hours of delay or detour times the average value of wages and benefits.

This section has reviewed the major types of loss-of-function impacts and how to calculate each one. A summary of loss-of-function impacts is given below in Table 2.2.

Table 2.2
Loss-of-Function Impacts

Type of Facility	Loss-of-Function Impact	Data Inputs
Building (residential, commercial, public)	Displacement costs	▪ Displacement time ▪ Rent for temporary quarters ▪ Other monthly costs ▪ One-time costs
Building (residential, commercial)	Rental income losses	▪ Displacement time ▪ Monthly rent
Building (commercial)	Business income losses Wage income losses	▪ Functional downtime ▪ Net business income per month ▪ Wages and benefits per month
Building (residential)	Disruption costs	▪ Disruption time ▪ Economic value per person per hour
Building (public, ordinary services))	Loss of public services	▪ Functional downtime ▪ Operating budget
Building (public, critical services))	Economic Impact of Loss of public services	▪ Functional downtime ▪ Operating budget ▪ Continuity premium (sometimes)
Utilities	Economic Impact of Loss of public services	▪ Functional downtime ▪ Economic impact per capita per day
Roads and Bridges	Economic impact of road and bridge closures	▪ Functional downtime ▪ Delay or detour time ▪ Daily traffic load ▪ Economic value per person per hour

2.3 Casualties

Natural disasters commonly result in casualties, including deaths, injuries, and illnesses. Casualties are the most devastating impact of disasters. Some mitigation projects are designed to reduce casualties in future disasters. Almost all earthquake projects are designed to reduce casualties, as are some hurricanes, wind, and flood mitigation projects.

For some mitigation projects, the benefits of reduced casualties can be a large fraction of the total benefits, or even the largest category of benefits. Thus, for some mitigation projects, it is very important to count the benefits of reduced casualties.

Like other benefits, the benefits of avoided casualties are calculated as the difference in casualties occurring before mitigation and after mitigation. FEMA uses statistical values to place a monetary value on the benefits of avoided casualties. In the most recent FEMA benefit-cost analysis software, statistical values of $1,250, $12,500 and $2,200,000 are assigned to minor injuries, major injuries and deaths, respectively. Minor injuries are defined as those requiring medical treatment, excluding minor bruises or scrapes. Major injuries are defined as those requiring hospitalization for treatment. Minor and major illnesses can be defined similarly, using the same statistical values.

When adjusted to year 2001, these statistical values for casualties are approximately $1,560, $15,600, and $2,710,000 for minor injuries, major injuries, and deaths, respectively. For economic correctness, these adjusted values are suggested for benefit-cost analysis of FEMA hazard mitigation projects.

As reviewed in Section 1.3, OMB guidance for benefit-cost analysis mandates that the benefits to be considered in FEMA's benefit-cost analyses are social net benefits, not the benefits to FEMA or to the federal government. Even though neither FEMA nor any other Federal Agency provides compensation for disaster casualties, the perspective of benefit-cost analysis is always that of the affected community. Thus, it is proper and indeed necessary to count the benefits of avoided casualties, whenever a mitigation project directly and demonstrably will reduce future casualties.

Counting the benefits of avoided casualties is necessary for nearly all earthquake mitigation projects. Reducing casualties is often the primary motivation for earthquake mitigation projects.

For many common types of mitigation projects, life safety benefits are non-existent or negligible. For example, except for situations with flash flooding or dam failures, most flood hazard mitigation projects do not significantly reduce casualties. Similarly, except for shelter projects, most hurricane mitigation projects do not significantly reduce casualties. Assuming that a mitigation project for floods or hurricanes will increase life safety may actually increase casualties by given a potentially false sense of safety and reducing people's motivation to evacuate when necessary.

For some mitigation projects life safety benefits are very important and must be included. Calculation of life safety benefits must always be done carefully, by experienced analysts. Including spurious life safety benefits has the potential to greatly distort benefit-cost results and lead to erroneous decisions about mitigation projects.

2.4 Emergency Management Costs

Disasters commonly result in a range of emergency management costs for affected communities. Emergency management costs include emergency operations center costs, evacuation or rescue costs, security costs, temporary protective measure costs, debris removal, pumping costs and other cleanup costs, and other costs for disaster response and recovery.

If a mitigation project under evaluation significantly reduces these emergency management costs, then the benefits of reduced emergency management costs should be counted. However, many FEMA hazard mitigation projects deal with single structures or a few scattered structures in a larger community. In this case, the reduction in emergency management cost is non-existent or negligible and should not be counted.

For example, elevating or acquiring a single structure or a few scattered structures in a community does not significantly impact a community's overall emergency management costs. However, acquisition of an entire flood prone neighborhood of homes might significantly reduce emergency management costs.

Determining whether or not a specific mitigation project significantly reduces a community's emergency management costs requires considerable judgment and experience. Calculation of such benefits must be done carefully, with full documentation of data and assumptions.

The most common subcategories of emergency management costs are:

Emergency operations center costs

Evacuation or rescue costs

Security costs

Temporary protective measure costs

Debris removal and cleanup costs

- Other management costs

2.5 Summary

The above sections provide summary guidance for four main categories of benefits, including avoided physical damages, avoided loss-of-function costs, avoided casualties, and avoided emergency management costs. For every type of benefit to be counted the procedure is the same: damages and losses are estimated both before and after undertaking a mitigation project. Then, benefits are calculated as the difference between damages and losses before and after mitigation, taking into account the time value of money (mitigation project useful lifetime and discount rate).

Within these four major categories of benefits, more than 20 subcategories of benefits were described briefly. However, once the basic procedure for calculating benefits for the major categories is mastered, calculating additional benefits for the subcategories is relatively straightforward.

Counting some of the less commonly used subcategories of benefits requires a little more ingenuity. In some cases, it may be convenient to do a side calculation and then add these benefits to those calculated in the module. For example, the modules for hurricane and flood projects to do not include spaces for calculating the benefits of reduced casualties. If counting the benefits of avoided casualties is necessary for a particular mitigation project (e.g., a hurricane shelter, or acquisition of properties subject to flash flooding), then a side calculation is probably the easiest way to include these benefits in the module.

As a caveat, it is important to do note that evaluating some types of projects, for example mitigation projects for utility systems, requires a moderate- to high-level of technical understanding of utility systems and thus should not be attempted by analysts lacking this expertise. Similarly, performing estimates of avoided casualty benefits and estimates of some of the other less commonly calculated benefits requires a considerable amount of experience and expertise and should not be attempted by novice analysts. Throughout the process of counting applicable benefits, care must also be taken to avoid double-counting benefits in more than one place or more than one subcategory.

This section provides examples of how to count benefits for "ordinary" buildings. In the present context, "ordinary" buildings are those that are not critical facilities for emergency response and recovery. Ordinary buildings include residential and commercial buildings, and public buildings used for non-critical functions, such as schools and administrative buildings. Public buildings used to provide services that are critical to disaster response and recovery, such as police, fire and medical facilities, emergency operations centers, and emergency shelters are addressed separately in Section 4.

Mitigation projects for ordinary buildings are the most common type of FEMA mitigation project. Most of the guidance below is applicable to mitigation projects for all types of hazards and for all types of mitigation projects. However, some categories of benefits may be applicable only to certain types of mitigation projects and/or only for some types of hazards. For example, counting the benefits of avoided casualties is almost always very important for seismic hazard mitigation projects, but generally not applicable to most other types of projects.

3.1 Single Residential Buildings

This section describes benefits to be counted for mitigation projects for single residential buildings, small groups of residential buildings, or a group of residential buildings at scattered locations. The benefits to be counted for mitigation projects for an entire neighborhood of residential buildings, which are somewhat different than for single buildings, are addressed in Section 3.2.

The categories of benefits to be counted for mitigation projects for single residential buildings are summarized below in Table 3.1.

For mitigation projects for residential buildings, the suggested benefit-cost analysis strategy is to first count the largest and most easily counted benefits. For this type of project, these benefits include building damages, contents damages, and displacement costs. For seismic projects, casualties should also be counted. If the project is cost-effective, it may not be necessary to count other benefits. If the project is not cost-effective, the categories of other physical damages and disruption costs are generally the most significant additional benefits to count. The other benefit categories generally contribute only minor benefits or aren't applicable.

Table 3.1
Categories of Benefits to be Counted
Single Residential Buildings[1]

Type of Benefits to Consider	When to Count
1. Physical Damages	
Building damages	Always counted
Contents damages	Always counted
Other physical damages[2] - Landscaping - Outbuildings - vehicles, equipment - site contamination	Applicable to acquisition or flood control infrastructure projects only[3]. Consider counting if significant, especially for projects that are close to being cost-effective without counting these categories.
2. Loss-of-Function Impacts	
Displacement costs	Always counted
Rental income losses	Can count if appropriate, but easier to include in displacement costs[4]
Business income losses	For home business, consider counting, but generally constitutes only a very small fraction of benefits
Disruption time costs[5]	Consider counting, especially for projects that are close to being cost-effective, can add significantly to benefits
3. Casualties	Always counted for seismic projects, rarely applicable to other projects[6]
4. Emergency Management Costs	Not applicable to single residential structures[7]

Notes:

[1] Guidance in table applies to single residential structures, small groups of residential structures, and groups of structures at scattered locations.

[2] Other physical damages can be counted by adding appropriate damage percentages to the damage function for building or contents. These damages may be significant and thus counting them may add significantly to the total benefits. This type of mitigation project does not reduce damages to off-site utilities or transportation systems and no benefits should be counted for such other physical damages.

[3] Other physical damages are applicable only to acquisition projects or flood control

infrastructure projects because mitigation projects to elevate or retrofit the primary structure have no impact on these other categories of damages - thus, there are no additional benefits.

[4] Rental income losses are not necessary to count if the full costs of temporary quarters are included in displacement costs for both owners and renters. Double-counting must be avoided.

[5] Disruption costs may be significant and thus counting them may add significantly to the total benefits.

[6] Casualties may be important for seismic hazard mitigation projects. Counting the benefits of avoided casualties may be a substantial fraction of total benefits and thus they should always be counted. For most other mitigation projects, benefits of casualties avoided are non-existent or negligible and thus should be counted only in special circumstances.

[7] Acquisition, elevation or retrofit of single residential structures, small groups of structures, or groups at scattered locations does not significantly reduce a community's emergency management costs because the area affected by a disaster is not decreased, and the total population affected by disaster is not decreased or not decreased significantly.

Counting Other Physical Damage. This simplified example is for floods, but the same principles apply for other hazards as well. Consider a one-story home without basement, with a replacement value of $100,000. Building damage estimates, before and after mitigation, are calculated as percentages of building replacement value. If other physical damages are to be added to building damages, these damages must also be expressed as percentages of building replacement value (not as percentages of their replacement value). For example, if landscaping damages at -2 feet flood depth are estimated as $500, then this damage is entered as 0.5% of the building replacement value (refer to Table 3.2).

Table 3.2
Example Showing How to Count Other Physical Damages

Flood Depth (feet)	Building Damage %	Landscaping and Outbuilding Damage %	Vehicle and Equipment Damage %	Adjusted Total Damage %
-2	0.0%	0.5%	0.0%	0.5%
-1	0.0%	1.0%	1.0%	2.0%
0	9.0%	1.5%	2.0%	12.5%
1	14.0%	2.0%	3.0%	19.0%
2	22.0%	2.5%	4.0%	28.5%
3	27.0%	3.0%	5.0%	35.0%

In this example, the building damage percentages are the typical or default values for a one-story structure without basement. Dollar damage estimates were made, using common sense and professional judgment, for the two other categories of physical damages. The dollar estimates were then converted to percentages of building replacement value. The sum of these damage percentages then represents the total damage estimates for the building, for landscaping and outbuildings, vehicles and equipment.

In making estimates of expected dollar damages for landscaping, outbuildings, vehicles, and equipment, historical damage data can be used, along with common sense. Structures with different types of landscaping may have different levels of damage. Not all homes have outbuildings and not all vehicles and equipment will be damaged in floods, because many owners will move such items to higher ground before floods. Whenever adjustments are made as shown above in the simplified example, full documentation of data sources and assumptions are essential.

If adjustments for other physical damages are made, it is very important to make appropriate, consistent adjustments in damage estimates both before and after mitigation. For example, damages to landscaping, outbuildings, vehicles and equipment are eliminated by acquisition. However, elevation or retrofit of the primary structure does not reduce these other types of damages. Thus, estimating these types of damages makes sense only for acquisition projects.

Counting Reduced Disruption Costs. To count the benefits of disruption, disruption time estimates must be made for each damage level (e.g., flood depth or wind speed bin). Then the dollar value of disruption time is calculated by multiplying the number of adults per house by the national average value of wages and benefits ($21.16) to get a dollar value of disruption time. This

dollar value for disruption time can be converted to a percentage of building replacement value and added to the building damage percentage in the same manner as discussed above for other physical damages. This approach is mathematically correct, and reasonably straightforward, albeit perhaps confusing to the novice. As always, whenever such adjustments are made, full documentation of data sources and assumptions is essential.

3.2 Groups of Residential Buildings

Counting benefits for groups of residential buildings is very similar to counting benefits for single residential buildings. All of the categories of benefits discussed above in Section 3.1 for single residential buildings apply to groups of residential buildings. For groups of buildings, these benefits can be calculated for each building and then summed.

In some cases, groups of very similar buildings can be combined for purposes of benefit-cost analysis. However, this type of aggregation has to be done carefully. Groups of buildings can be combined if and only if they are the same structure type and have very similar frequencies and severities of disaster events. For flood mitigation projects this means that the structures must have very closely similar first floor elevations, and be close enough geographically so that they have very closely similar flood hazard data. For hurricane, wind, or earthquake projects, this means that the structures must be geographically close.

In addition to the benefits countable for single residential structures, mitigation projects for groups of residential may have two additional categories of benefits in some cases: avoided infrastructure damages and avoided emergency management costs. These additional benefits are generally only applicable to certain types of flood hazard mitigation projects.

If a mitigation project, such as improvements in flood control infrastructure, affects an entire town or an entire neighborhood, the damages to infrastructure will generally be reduced along with damages to the structures themselves. For example, there will be reduced damages to roads and utilities as well as to buildings. Similarly, if an acquisition project removes all of the homes from a neighborhood, then much of the infrastructure supporting the homes can be "retired" and is no longer subject to damage.

Likewise, if improvements in flood control infrastructure or acquisition of all homes in a neighborhood significantly reduces the level of flood risk for a community, then there is expected to be a proportional reduction in future emergency management costs.

All of the categories of benefits discussed above in Section 3.1 for single residential structures also apply to groups of residential structures. The additional categories of benefits that may be applicable

for some flood hazard mitigation projects for groups of residential structures are summarized below in Table 3.3.

Table 3.3
Additional Categories of Benefits to be Counted for Groups of Residential Buildings[1,2]

Additional Types of Benefits to Consider	When to Count
1. Physical Damages	
Other physical damages: - infrastructure	Applicable only to some flood mitigation projects
2. Emergency Management Costs	
Emergency operations center costs Evacuation or rescue costs Security costs Temporary protective measure costs Debris removal and cleanup costs Other emergency management costs	Applicable only to some flood mitigation projects

Notes:

[1] These possible additional categories of benefits apply only when a mitigation project such as improvements in flood control infrastructure affects an entire town or entire neighborhood or when an acquisition project affects an entire neighborhood.

[2] These possible additional categories of benefits generally apply only to flood hazard mitigation projects. Mitigation projects for hurricanes and earthquakes generally affect only individual structures and do not reduce a community's infrastructure damages or emergency management costs.

3.3 Commercial Buildings

Most of the benefit categories counted for commercial buildings are the same as for residential buildings discussed above. One exception is that disruption costs, which may be counted for residential buildings, are not applicable to commercial buildings. The equivalent of disruption time

for commercial businesses is already implicitly included in estimates of functional downtime and lost business income. To count disruption time for commercial structures would be double-counting.

For mitigation projects for commercial buildings, the suggested benefit-cost analysis strategy is to count first the largest and most easily counted benefits. For this type of project, these benefits include building damages, contents damages, and displacement costs. In addition, for seismic projects, casualties should always be counted. If the project is cost-effective, it may not be necessary to count additional benefits. If not, the categories of other physical damages, business income losses and wage losses are generally the most significant additional benefits to count. The other categories are likely to contribute only minor benefits or to not be applicable.

The categories of benefits to be counted for mitigation projects for single commercial buildings (or small groups of commercial buildings or a group of commercial buildings at scattered locations) are summarized below in Table 3.4.

Table 3.4
Categories of Benefits to be Counted for Commercial Buildings[1]

Type of Benefits to Consider	When to Count
1. Physical Damages	
Building damages	Always counted
Contents damages	Always counted
Other physical damages[2] - landscaping - outbuildings - vehicles, equipment - site contamination	Applicable to acquisition or flood control infrastructure projects only[3]. Consider counting if significant, especially for projects that are close to being cost-effective without counting these categories
2. Loss-of-Function Impacts	
Displacement costs	Always counted
Rental income losses	Can count if appropriate, but easier to include in displacement costs[4]
Business income losses[5]	Consider counting, but generally constitutes only a small fraction of benefits
Wage income losses[5]	Consider counting, especially for projects that are close to being cost-effective, can add significantly to benefits

Type of Benefits to Consider	When to Count
3. Casualties	Always counted for seismic projects, rarely applicable to other projects[6]
4. Emergency Management Costs	Not applicable to single commercial structures[7]

Notes:

[1] Guidance in table applies to single commercial structures, small groups of commercial structures, and groups of structures at scattered locations.

[2] Other physical damages can be counted by adding appropriate damage percentages to the damage function for building or contents. These damages may be significant and thus counting them may add significantly to the total benefits. This type of mitigation project does not reduce damages to off-site utilities or transportation systems and no benefits should be counted for such other physical damages.

[3] Other physical damages are applicable only to acquisition or flood control infrastructure projects because mitigation projects to elevate or retrofit the primary structure have no impact on these other categories of damages - thus, there are no additional benefits.

[4] Rental income losses are not necessary to count if the full costs of temporary quarters are included in displacement costs for both owners and renters. Double-counting must be avoided.

[5] Business income losses and especially wage losses may be significant for commercial structures and thus counting them may add significantly to the total benefits.

[6] Casualties may be important for seismic hazard mitigation projects. Counting the benefits of avoided casualties may be a substantial fraction of total benefits and thus they should always be counted. For most other mitigation projects, benefits of casualties avoided are non-existent or negligible and thus should be counted only in special circumstances.

[7] Acquisition, elevation or retrofit of single commercial structures, small groups of structures, or groups at scattered locations does not significantly reduce a community's emergency management costs because the area affected by a disaster is not decreased, and the total population affected by disaster is not decreased or not decreased significantly.

For commercial businesses, the appropriate measure of business income losses is net business income not gross business income because loss of function of a commercial building (i.e., functional downtime) generally reduces costs as well as receipts.

Loss of wage income generally applies only to hourly employees, since most salaried employees are likely to continue to be paid during relatively short post-disaster business interruptions. Estimates of lost wages should include wages and benefits. If local data are not available, the national average value of $21.16 for hourly wages and benefits may be used for benefit-cost analysis.

Only in rare circumstances are FEMA hazard mitigation projects likely to include an entire neighborhood of commercial structures. If, however, a flood infrastructure improvement project or flood acquisition project does affect an entire neighborhood of commercial structures (or a mix of

residential and commercial structures), then the additional benefits discussed above for groups of residential structures also apply to groups of commercial structures. These possible additional benefits, which include avoided infrastructure damages and avoided emergency management costs, are subject to the same caveats and the same calculation methods as for residential structures.

3.4 Public Buildings

Most of the categories of benefits to be counted for public buildings are the same as for commercial buildings discussed above. Two exceptions are that business income losses and wage income losses are generally not applicable to public buildings. For public buildings, the measure of the economic impact of loss of function of a building is the loss of public services.

For ordinary public buildings that do not provide critical services for disaster response and recovery, the measure of the value of loss of service is the cost of providing the public service. To value public services, FEMA makes the very simple and direct assumption that public services are worth what it costs to provide the services to the public. For example, if a public service costs $1,000 per day to provide, then the value is assumed to be $1,000 per day. If the service is lost because of damage to the building, the loss is assumed to be $1,000 per day. If the loss of service is avoided because of a hazard mitigation project, then the benefit is assumed to be $1,000 per day. This method for valuing the loss of public services applies to all public services.

The daily cost of services is estimated from the annual operating budget for the agencies occupying a building. The annual operating budget includes all of the direct costs necessary to provide the public services, including salaries and benefits, materials, supplies, utilities, equipment costs, and rent or the annual cost of owning the building. The only exclusion is for transfer payments. For example, if a public office distributes pension checks, the value of the service is not the value of the checks distributed, but rather the cost of providing the service.

The equivalent of wage income losses is already explicitly included in estimates of functional downtime and loss of public services, because wages and benefits are a large portion of the costs of providing public services. Thus, to count wage income losses separately for public structures would be double counting.

For ordinary public buildings, a continuity premium is not added to the normal cost of service. A continuity premium is added only for services such as police, fire and medical, that is critical to emergency response and recovery. However, if some fraction of the staff of an ordinary public building does provide emergency services, an appropriate continuity premium could be added to that proportionate fraction of the cost of services.

For mitigation projects for public buildings, the suggested benefit-cost analysis strategy is to count first the most easily identifiable and quantifiable benefits. For this type of project, these benefits include building damages, contents damages, displacement costs, and loss of public services. In addition, casualties should always be counted for seismic projects. If the project is cost-effective, it may not be necessary to count additional benefits. If the project is not cost-effective, the category of other physical damages may add the most significant additional benefits to count. The other benefit categories generally contribute only minor benefits or aren't applicable.

The categories of benefits to be counted for mitigation projects for public buildings are summarized below in Table 3.5.

Table 3.5
Categories of Benefits to be Counted for Public Buildings

Types of Benefits to Consider	When to Count
1. Physical Damages	
Building damages	Always counted
Contents damages	Always counted
Other physical damages[1] - landscaping - outbuildings - vehicles, equipment - site contamination	Applicable to acquisition or flood control infrastructure projects only[2]. Consider counting if significant, especially for projects that are close to being cost-effective without counting these categories
2. Loss-of-Function Impacts	
Displacement costs	Always counted
Loss of public services	Always counted No continuity premium for ordinary services
3. Casualties	Always counted for seismic projects, rarely applicable to other projects[3]
4. Emergency Management Costs	Not applicable to single public structures[4]

Notes:

[1] Other physical damages can be counted by adding appropriate damage percentages to the damage function for building or contents. These damages may be significant and thus counting them may add significantly to the total benefits. This type of mitigation project does not reduce damages to off-site utilities or transportation systems and no benefits should be counted for such other physical damages.

[2] Other physical damages are applicable only to acquisition or flood control infrastructure projects because mitigation projects to elevate or retrofit the primary structure have no impact on these other categories of damages - thus, there are no additional benefits.

[3] Casualties may be important for seismic hazard mitigation projects. Counting the benefits of avoided casualties may be a substantial fraction of total benefits and thus they should always be counted. For most other mitigation projects, benefits of casualties avoided are non-existent or negligible and thus should be counted only in special circumstances.

[4] Acquisition, elevation or retrofit of single public structures, does not significantly reduce a community's emergency management costs because the area affected by a disaster is not decreased, and the total population affected by disaster is not decreased or not decreased significantly.

3.5 Summary

Benefit-cost analysis of ordinary residential, commercial, or public buildings is straightforward. Many of the same benefits are counted, regardless of the function of the building. For ordinary buildings, the following benefits are always counted and are usually the largest categories of benefits: 1) building damages, 2) contents damages, and 3) displacement costs. In addition, for public buildings, the value of lost public services should always be counted. For seismic hazard mitigation projects, the benefits of avoided casualties are often very important, sometimes the largest single category of benefits, and should always be counted. The most important benefits to count are summarized in Table 3.6 below.

Table 3.6
The Most Important Benefits for Hazard Mitigation Projects for Ordinary Buildings

Types of Benefits to Consider	When to Count
▪ Building damages	Always counted
▪ Contents damages	Always counted
▪ Displacement costs	Always counted
▪ Loss of public services	Always counted for public buildings
▪ Casualties	Always counted for seismic projects

In addition, there are several other categories of benefits that apply in more limited cases or are generally significantly smaller than those identified in Table 3.6. Possible additional benefits to count are summarized below in Table 3.7.

Table 3.7
Possible Additional Benefits to Count
(if project is not cost-effective after counting benefits in Table 3.6)

Types of Benefits to Consider	When to Count
▪ Other physical damages	Applicable for all building types, but only for acquisition or flood control infrastructure mitigation projects; may add significantly to total benefits.
▪ Rental income losses	Applicable to all building types, but not necessary to count; instead, it is easier to include in displacement costs.
▪ Business income losses	Applicable to commercial buildings and to home businesses; this category of benefits is generally small.
▪ Wage income losses	Applicable only to commercial buildings; may add significantly to total benefits.
▪ Disruption costs	Applicable to residential buildings; may add significantly to total benefits.

Types of Benefits to Consider	When to Count
▪ Emergency management costs	Applicable only to flood control infrastructure projects or acquisition projects that protect entire neighborhoods; this category of benefits is generally small.

Critical Facilities: Police, Fire and Medical Buildings

This section provides guidance and examples of how to count benefits for mitigation projects for buildings providing police, fire, and medical services. Such buildings are considered critical facilities because the services they provide are critical to disaster response and recovery.

Benefit-cost analysis for critical facilities is generally similar to that for ordinary public buildings. The same categories of benefits are typically counted, as summarized below in Table 4.1

Table 4.1
Categories of Benefits to be Counted for
Critical Facilities: Police, Fire and Medical Buildings

Types of Benefits to Consider	When to Count
1. Physical Damages	
▪ Building damages	▪ Always counted ▪ Building replacement values may differ from those for ordinary buildings ▪ Specialized damage functions may be needed
▪ Contents damages	▪ Always counted ▪ Contents replacement values may differ from those for ordinary buildings ▪ Specialized damage functions may be needed
▪ Other physical damages1 - landscaping - outbuildings - vehicles, equipment - site contamination	Applicable to acquisition or flood control infrastructure projects only[2]. Consider counting if significant, especially for projects that are close to being cost-effective without counting these categories
2. Loss-of-Function Impacts	
▪ Displacement costs	▪ Generally counted ▪ May not be applicable for some facilities
▪ Loss of public services	▪ Always counted ▪ A continuity premium must be added to the normal cost of providing service ▪ In many cases, the continuity premium has a large impact on the benefit-cost analysis
3. Casualties	Always counted for seismic projects, rarely applicable to other projects[3]
4. Emergency Management Costs	Not applicable to single public structures[4]

Notes:

[1] Other physical damages can be counted by adding appropriate damage percentages to the damage function for building or contents. These damages may be significant and thus counting them may add significantly to the total benefits. This type of mitigation project does not reduce damages to off-site utilities or transportation systems and no benefits should be counted for such other physical damages.

[2] Other physical damages are applicable only to acquisition or flood control infrastructure projects because mitigation projects to elevate or retrofit the primary structure have no impact on these other categories of damages - thus, there are no additional benefits.

[3] Casualties may be important for seismic hazard mitigation projects. Counting the benefits of avoided casualties may be a substantial fraction of total benefits and thus they should always be counted. For most other mitigation projects, benefits of casualties avoided are non-existent or negligible and thus should be counted only in special circumstances.

[4] Acquisition, elevation or retrofit of single public structures, does not significantly reduce a community's emergency management costs because the area affected by a disaster is not decreased, and the total population affected by disaster is not decreased or not decreased significantly.

There are, however, important differences in benefit-cost analysis of mitigation projects for critical facilities as compared to analysis for ordinary buildings.

4.1 Physical Damage Estimates for Police, Fire and Medical Buildings

Physical damage patterns for these types of buildings are generally similar to those for ordinary buildings. However, in some cases critical facilities are designed to higher codes and standards than ordinary buildings and thus may be somewhat less vulnerable to damages. Building replacement values may also differ because of the specialized nature of these buildings. For example, building replacement values for hospitals can be has high as $300 per square foot. On the other hand, building replacement values for fire stations can be quite low, because of the simple nature of most fire stations, with much of the space being garage space for fire apparatus. Building replacement values for police, fire, or medical facilities are generally available from the agencies providing such services, from local building officials, or from local building engineers.

Contents damage patterns for these types of buildings are generally similar to those for ordinary buildings. In some cases, professional judgment is necessary to adjust typical or default contents damage functions to reflect the specialized communications or medical equipment in these types of facilities. For hospitals and other medical facilities, the contents replacement value may be very high, in some cases similar to or exceeding the building replacement value. Appropriate contents

replacement values for police, fire, or medical facilities are generally available from the agencies providing such services, from local building officials, or from local building engineers.

For acquisition or flood control infrastructure mitigation projects, one of the benefits may be reductions in other physical damages. As for ordinary buildings discussed in Section 3, other physical damages for critical service buildings include damages to landscaping, outbuildings, vehicles, and equipment and possible site contamination. Such damages can be estimated, but are generally small compared to the other categories of benefits for critical service facilities. Thus, such benefits can generally be ignored except for projects that are very close to being cost-effective without counting this category. For mitigation projects other than acquisition or flood control infrastructure, there are no benefits in this category because elevation, retrofit or strengthening of a building itself does not reduce this category of damages.

4.2 Displacement Costs

When facilities housing police and fire services are damaged to an extent such that the buildings cannot be occupied during repairs, the services are moved to temporary quarters. The displacement costs for such temporary quarters are part of the damages and losses attributed to a disaster and these displacement costs become part of the benefits to the extent that they are avoided or reduced by a mitigation project.

Displacement costs for police and fire facilities are counted in the same manner as for ordinary buildings. Displacement costs include:

Monthly costs of rent for temporary space

Other monthly costs such as furniture rental

One-time costs such as round-trip moving costs, utility connection fees and other such costs

For police and fire facilities, the one-time costs may be higher than for ordinary buildings because of the critical communications equipment that would have to be moved and reinstalled. Other monthly costs could also include extra transportation time and costs if the temporary facility is not as well located as the permanent facility.

For police facilities that include jails, the concept of displacement costs is somewhat more complicated. For security reasons, inmates probably cannot be housed in ordinary temporary quarters. Rather, displacement of jail inmates probably requires moving inmates to another correctional facility. In such cases, displacement costs would include the transportation or moving costs, any extra daily transportation time and costs, plus the monthly cost of housing inmates in the alternative facility.

For hospitals, the concept of displacement to temporary quarters is also somewhat more complicated. Some hospital facilities such as office space, storage space, residential quarter for staff and other ordinary functions can be relocated to temporary quarters. For such space, displacement costs are calculated as summarized above for police and fire services.

Some hospital services, including most patient care facilities cannot readily be located to temporary quarters. For such services, displacement probably requires moving patients and services to another medical facility. In this case, displacement costs would include the transportation or moving costs, any extra daily transportation time and costs, plus the extra monthly cost of housing patients in the alternative facility.

The typical values for displacement time assume that building damages of less than 10% of the building replacement value can be repaired without requiring displacement of occupants. For damages above 10%, a minimum displacement of 30 days is assumed, with the displacement time increasing linearly with damage percentage up to a cap of 365 days (one year) for displacement time. That is, regardless of the level of damages, it is assumed that public services will be back in the original (repaired) building or in a new permanent building within one year of the disaster. Professional judgment, experience, and many years of use confirm that these estimates appear reasonable in most cases, especially for small- to medium-sized facilities.

For major, complex or specialized facilities that suffer major damage or that require replacement with new facilities, or for large, monumental historical buildings, longer displacement times of up to two or three years are sometimes experienced. While such long displacement times are uncommon, they do occur and in such cases it is important to make realistic estimates of displacement time. Displacement time estimates for major complex projects can be based on construction duration estimates, construction bids, or on the professional judgment of the design and construction details of the repairs or of the replacement facility. Longer displacement time estimates are appropriate if and only if there is sound documentation of longer repair or replacement times for a specific facility under evaluation.

4.3 Loss of Public Services

For critical facilities, the first step in evaluating the benefits of reducing the loss of public service is exactly the same as that for ordinary buildings, as discussed in Section 3.4. The base value of public services, including police, fire and medical services, is estimated from the annual operating budget of the facility providing the service. The annual operating budget includes all of the direct costs necessary to provide the public services, including salaries and benefits, materials, supplies, utilities, equipment costs, and rent or the annual cost of owning the building. The only exclusion is for

transfer payments. For example, if a public office distributes pension checks, the value of the service is not the value of the checks distributed, but rather the cost of providing the service.

The equivalent of wage income losses is already explicitly included in estimates of functional downtime and loss of public services, because wages and benefits are a large portion of the costs of providing public services. Thus, to count wage income losses separately for public structures would be double-counting.

4.3.1 Continuity Premiums for Police, Fire and Medical Services

A continuity premium is a measure of the extra importance that some public services have during disasters. In simple terms, a continuity premium is a measure of how much extra a community would be willing to pay to continue to have critical services during a disaster.

In benefit-cost analysis, the effect of a continuity premium is to count more highly those services that are essential for disaster response and recovery, compared to ordinary services that are not more important to a community during disasters. A high continuity premium increases the benefits of a mitigation project by increasing the benefits of avoiding loss of public services.

In assigning continuity premiums for police, fire and hospital services, the following question must be answered:

> **In a disaster, how much more important are police, fire and hospital services compared to their value to the community in non-disaster circumstances?**

Answering the above question and thereby determining an appropriate continuity premium for these services profoundly affects the determination of which hazard mitigation projects are or are not cost-effective.

For police and fire services, the maximum possible continuity premium is limited by the capacity of police and fire departments to respond to emergency calls. For example, police and fire departments cannot respond to 1,000 times more calls than normal during a disaster because of limited staff and apparatus. A more detailed analysis of continuity premiums for police and fire services is given in Chapter 1 of the Supporting Documentation (Technical Appendix: Guidance for Benefit-Cost Analysis of Mitigation Projects for Police, Fire, and Medical Service Facilities). In general, a continuity premium of ten times the normal cost of service is appropriate for police and fire services.

For medical services, similar concepts apply as discussed above for police and fire services, although appropriate continuity premiums for medical services vary with the disaster type as follows:

For earthquakes, the potential for mass casualties means that an appropriate continuity premium will be governed by the capacity to provide emergency medical services. A continuity premium of 10 times the normal cost of service is suggested for medical facilities providing direct patient care.

For floods, there is very little likelihood of significantly more than normal demand for emergency medical services and therefore no continuity premium should be applied.

For hurricanes, the typical number of casualties is low because of the widespread evacuations that are commonly ordered in advance of a hurricane. Thus, there is very little likelihood of significantly more than normal demand for emergency medical services and no continuity premium should be applied.

For tornadoes and fires, some casualties are likely. However, such events typically impact only very small segments of a hospital service area and thus, there is very little likelihood of significantly more than normal demand for emergency medical services and no continuity premium should be applied

Thus, for hospitals and other patient care medical facilities, a continuity premium is suggested only for seismic hazard mitigation projects. For seismic hazard mitigation projects for hospitals, a continuity premium of 10 is suggested only for facilities providing direct patient care. For a hospital complex as a whole, many facilities are support facilities not directly related to immediate patient care; therefore for hospital complexes as a whole, a continuity premium of 5 is suggested. For non-patient care buildings within a hospital complex, continuity premiums from none to perhaps 5 are suggested, depending on the strength of the linkage between the building's services and patient care. A more detailed analysis of continuity premiums for hospitals and other medical care services is given in Chapter 1 of the Supporting Documentation (Technical Appendix: Guidance for Benefit-Cost Analysis of Mitigation Projects for Police, Fire, and Medical Service Facilities).

Suggested continuity premiums for police, fire and medical services are summarized below in Table 4.2.

Table 4.2
Continuity Premiums
Police, Fire, and Medical Services

Type of Facility	Continuity Premium
Police Services	10
Fire Services	10
Medical Services	▪ 0 for non-seismic mitigation projects ▪ 10 for seismic mitigation projects for patient care facilities ▪ 5 for seismic mitigation projects for whole hospital complex ▪ 0 to 5 for seismic mitigation projects for non-patient care buildings, depending on linkage between services provided and patient care

4.3.2 Functional Downtime Estimates for Police, Fire and Medical Services

Functional downtime is the number of days that a public service is not available because of disaster damage. Functional downtime days may be fractional. For example, one day of functional downtime may be one day with 100% loss of service or two days with 50% loss of service or 10 days with 10% loss of service.

Functional downtime is not the same as displacement time. For example, a building providing a public service is damaged in a flood and occupants are displaced to temporary quarters for 3 months while repairs are made. The public service, however, is restored in two weeks from the temporary quarters. In this simple example, the functional downtime is two weeks, while the displacement time is three months.

Estimates of functional downtime are substantially different for critical services than for ordinary services. For example, if a library suffers damage in a flood or an earthquake, the library may close for several weeks or several months. Loss of library service may be tolerable to a community for an extended period of time. However, if a police or fire station suffers a similar level of damage, the police or fire services cannot be closed down for an extended period of time because these services are simply too important to the community. Thus, in the case of damage to a police or fire station, the essential police or fire services are generally reestablished quickly in temporary quarters. Essential services will be reestablished much more quickly than would less important services.

A general rule of thumb is that the more important a public service is to a community, the shorter the functional downtime will be.

Police and fire services are in large part provided away from the facility housing the staff and apparatus. This aspect of such services is very important because it means that, to a considerable degree, service can be continued even when the facility housing the service has considerable damage. In an emergency, many operations can be run from a parking lot with manual dispatch or cell phone dispatch in the event that a station is heavily damaged in a disaster.

For the reasons cited above, loss of police and fire services is almost always partial. It would be very rare for a police or fire department to provide no service for any significant period of time. Rather, damage to facilities or disruption of communication links commonly result in delays or disruption of normal service. For any given disaster event, days of loss of service are not likely to be complete days with 100% loss of service. More likely there might be, for example, one day with 50% service, several days with 80% service and several days with 90% service. When historical data on service disruption are available, the functional downtime can be calculated by summing up the fractional days of lost service over the service restoration time period after the disaster.

The concepts discussed above and the analysis of functional downtime for police and fire services suggests that functional downtimes for these services are expected to be significantly shorter than for ordinary (non-critical) public services. A common sense rule of thumb, based on professional judgment and experience, is that functional downtimes might average a factor of three less than for ordinary public services.

Functional downtime estimates for hospitals are, in some regards, similar to those for police and fire services. Because hospital services, like police and fire services, are obviously important to a community in a disaster situation, functional downtimes are likely to be shorter for hospitals than for ordinary facilities. That is, repair and restoration of damaged hospital facilities almost always has a very high priority.

However, the shorter functional downtimes expected for hospitals because of their importance to the community is counterbalanced by the fact that many critical hospital services require special, sterile medical conditions and complex modern medical equipment. Thus, while police and fire staff and apparatus can be dispatched from a parking lot, if necessary, few major medical, surgical, or diagnostic procedures requiring specialized equipment and/or sterile conditions can be performed in a parking lot.

Similarly, a few inches of water or even a foot or two of water in a police or fire station will disrupt service, but will not result in complete loss of service. However, a few inches of water in an operating room, a diagnostic room with specialized medical equipment, or a patient care room, would almost certainly result in complete loss of service.

Combining the importance of hospital services to a community and the medical requirements for sterile conditions and other operating constraints for medical facilities suggests that functional downtimes for hospitals are likely to be shorter than those for ordinary buildings but longer than

those for police and fire services. A common sense rule of thumb, based on professional judgment and experience, is that functional downtimes for hospitals might average a factor of two less than for ordinary public services.

4.4 Casualties

In some disaster events, occupants of facilities housing police and fire services and hospitals and other medical facilities are at risk of injury or death. Casualty estimates for such facilities are made in exactly the same manner as for ordinary buildings. Casualties are estimated from the average occupancy (24 hours per day, 365 days per year) of a facility and the estimated casualty rate as a function of severity of disaster.

For these critical facilities, casualty estimates are most important for earthquakes. Major earthquakes may pose a significant life safety risk for occupants of buildings with seismic vulnerabilities. For seismic hazard mitigation projects, the benefits of reduced or avoided casualties may be a major component of total benefits for any of these critical facilities, which usually have 24-hour occupancy. However, the benefits of avoided casualties are particularly important for hospitals because of their typically very high occupancy levels (patients, staff, and visitors). In some cases, especially for hospitals, the benefits of reduced casualties may be the largest single benefit of a mitigation project. For seismic mitigation projects, the benefits of reduced casualties are important and these benefits should always be counted.

For floods and hurricanes, casualties are generally low and many casualties that do occur are a result of individuals ignoring evacuation warnings (in the case of hurricanes) or ignoring road or bridge closures (in the case of floods). For most flood and hurricane hazard mitigation projects the benefits of reduced casualties are generally not significant and are not considered in the benefit-cost analysis. However, critical facilities such as those for police and fire services and hospitals are probably less likely to be evacuated in hurricanes than are ordinary facilities. Especially for mitigation projects that are designed to harden such facilities to withstand hurricane winds or tornadoes, the benefits of reduced casualties may be significant and should be considered in the analysis. In these circumstances, casualty rate estimates should always be made in close consultation with an engineer knowledgeable about the wind design characteristics of the existing building and the capacity of the post-mitigation building.

For benefit-cost analyses where reductions in casualties are included, the benefits of casualties avoided are often a large component of total benefits and thus estimates of casualty rates before and after mitigation become a very important determinant of the overall benefit-cost analysis and results. Making realistic estimates of casualty rates is difficult and requires a substantial understanding of the failure modes of buildings and the likely casualty rates that would result. Estimates of casualty rates

should always be made by an engineer or analyst very knowledgeable about such issues, with a considerable amount of experience.

For seismic mitigation projects, the casualty rate estimates in the FEMA-sponsored HAZUS program (HAZUS, Earthquake Loss Estimation Methodology, National Institute of Building Science and Federal Emergency Management Agency, 1997) provide the best available consensus estimates of casualty rates for different structural types of buildings designed to varying seismic design levels. However, using these estimates is possible if and only if a building's seismic vulnerability is expressed as a fragility curve. A fragility curve is a mathematical representation that states the probability that a building will sustain a given level of damage as a function of the level of ground motion. Fragility curve-based estimates of casualty rates are the best available, but the necessary calculations are mathematically complicated and should not be attempted by analysts not thoroughly familiar with this mathematics.

Damage to critical facilities may also result in a loss of function that may pose a life safety threat to the community served by the facility. This potential casualty risk is separate from casualty risk faced by the occupants of the building. Police, fire and medical services are directly related to life safety in the community as a whole. The high operating budgets of such facilities reflect, in large part, the life safety aspects of these services. However, the life safety impacts of losing service from such facilities are already included in the value of public services calculation discussed above in Section 4.3. The high normal daily cost of service and the high continuity premiums for these critical services include the importance of these facilities in preserving life safety in the community. Thus, separate casualty estimates for the community as a whole should not be done for benefit-cost analysis and to do so would be to incorrectly double-count life safety benefits.

4.5 Summary Guidance

The major categories of benefits to be counted for mitigation projects for public buildings providing police, fire, and medical services are summarized below in Table 4.3.

Table 4.3
Summary Guidance
Benefit-Cost Analysis of Mitigation Projects for Police, Fire, and Medical Facilities

Damages/Benefits Categories	Data Sources and Guidance
1. Physical Damages	
▪ Building replacement value and contents value	Values from local officials.
▪ Building and contents damage functions	Historical data and professional judgment, as necessary.
▪ Other physical damages	For acquisition and flood control infrastructure projects only, generally of minor importance, estimates based on historical data and professional judgment.
2a. Economic Impact of Loss of Function (i.e., Displacement Costs)	
▪ Displacement time	Historical data and professional judgment, as necessary.
▪ Displacement costs	Estimates of monthly rent, other costs, and one-time costs from local officials. Costs may differ for critical service facilities.
2b. Economic Impact of Loss of Function (i.e., Loss of Public Services)	
▪ Normal cost of service	Annual operating budgets from local officials
▪ Functional downtime	▪ Police services: 1/3 of typical values ▪ Fire services: 1/3 of typical values ▪ Medical services: 1/2 of typical values
▪ Continuity Premiums - police and fire services	10x cost of normal service
▪ Continuity Premiums - medical services, seismic projects	▪ Patient care facilities: 10x cost of normal services ▪ Whole medical complex: 5x cost of normal services ▪ Non-patient care bldgs: 0 to 5x cost of normal services
▪ Continuity Premiums - medical services, other projects	None, demand for services is typically not significantly greater than normal

Damages/Benefits Categories	Data Sources and Guidance
3. Casualties	
▪ Average Facility occupancy	Local officials or applicant
▪ Casualty rates	HAZUS casualty rates for earthquakes, professional judgement for other hazards
▪ Statistical values of deaths, injuries, and illnesses	FEMA values, updated to 2001 values, see Section 2.3 - deaths: $2,710,000 - major injuries/illnesses: $15,600 - minor injuries/illnesses: $1,560

Mitigation projects for critical facilities are, by definition, important projects to communities. The guidance for benefit-cost analysis presented above makes it more likely that mitigation projects are cost-effective, compared to similar mitigation projects for ordinary facilities. Most importantly, the continuity premium places a greater value on avoiding loss of service, thus substantially increasing benefits. Furthermore, especially for hospitals, the greater building values, contents values, and high occupancy all result in higher benefits when mitigation projects will reduce damages and casualties. Benefit-cost analysis properly and fully recognizes and counts the importance of these critical facilities to a community.

However, regardless of how important these facilities may be to a community, not every mitigation project for a critical facility will be cost-effective. For example, consider a mitigation project for a seismic upgrade or replacement of a fire station built below the current building codes. If the building is located in a high seismic hazard area and is constructed of unreinforced masonry, subject to collapse during an earthquake with resulting casualties and substantial loss of the important services, then the benefits of retrofit or replacement will be very high. In many such cases, even a complete replacement of the building with a new building may be cost-effective. On the other hand, if the existing fire station has only minor seismic deficiencies, with little potential for casualties, and only limited potential for loss of service, then a very expensive seismic retrofit (e.g., $100 or $150 per square foot) to bring the entire building up to current code requirements will almost certainly not be cost-effective. In these circumstances a more modest seismic retrofit to address the specific deficiencies has a higher likelihood of being cost-effective.

Mitigation projects for critical facilities, which are reasonable in cost and address specific deficiencies in high hazard areas, have a high likelihood of being cost-effective. On the other hand, expensive mitigation projects that correct only minor deficiencies or located in areas with only minor exposure to hazards are unlikely to be cost-effective, even for critical facilities. It is important to understand that a benefit-cost analysis indicating that a mitigation project for a critical facility is not

cost-effective does not mean that the benefit-cost analysis is flawed but may instead indicate that the mitigation project is poorly conceived and, indeed, not worth doing.

In many regards, benefit-cost analysis of mitigation projects for emergency operations centers (EOCs) and emergency shelters is similar to that for other critical facilities. For EOCs and emergency shelters, however, there are two very important differences: 1) such facilities often occupy only part of a building, and 2) such facilities are in function only immediately before, during or immediately after disaster events. Both of these differences affect benefit-cost analysis of mitigation projects for EOCs and emergency shelters.

Many mitigation projects for EOCs and emergency shelters address only the portion of a building used for the EOC or shelter. In this case, the benefit-cost analysis should consider only the portion of the building used for the EOC or shelter, because such a mitigation project has no effect on the remainder of the building. Estimates of building damages, contents damages, displacement costs, casualties, loss of public services and any other categories of benefits should consider only the portion of the building used as an EOC or shelter.

If a mitigation project affects the entire building housing an EOC or shelter and other non-critical public functions, then the easiest way to approach the benefit-cost analysis is to consider separately the parts of the building providing ordinary services and critical services and then add the benefits together. For benefit-cost analysis, the part of the building providing ordinary services is evaluated in exactly the same manner as "ordinary" public buildings, with guidance as outlined in Section 3.

> **For benefit-cost analysis, the portion of a building providing EOC or shelter services is treated conceptually as a separate building.**

The guidance in this section focuses only on portions of a facility providing EOC or shelter services, or the whole building if the whole building provides EOC or shelter services.

Benefit-cost analysis for these buildings or parts of buildings providing EOC or emergency shelter services is generally similar to that for ordinary public buildings. The same categories of benefits are typically counted, as summarized below in Table 5.1

Table 5.1
Categories of Benefits to be Counted
Critical Facilities: EOCs and Emergency Shelters

Types of Benefits to Consider	When to Count
1. Physical Damages	
▪ Building damages	▪ Always counted ▪ Building replacement values may differ from those for ordinary buildings ▪ Specialized damage functions may be needed
▪ Contents damages	▪ Always counted ▪ Contents replacement values may differ from those for ordinary buildings ▪ Specialized damage functions may be needed
▪ Other physical damages[1] - landscaping - outbuildings - vehicles, equipment - site contamination	▪ Applicable to acquisition or flood control infrastructure projects only2 ▪ Consider counting if significant, especially for projects that are close to being cost-effective without counting these categories
2. Loss-of-Function Impacts	
▪ Displacement costs	▪ May be applicable for some facilities, ▪ Displacement time estimates are different than for ordinary buildings: limited to normal duration of use during disasters
▪ Loss of public services	▪ Always counted ▪ A continuity premium must be added to the normal cost of providing service ▪ In many cases, the continuity premium has a large impact on the benefit-cost analysis ▪ Functional downtime estimates are different than for ordinary buildings: limited to normal duration of use during disasters
3. Casualties	Always counted for seismic projects, may be applicable for hurricane and tornado projects as well[3]
4. Emergency Management Costs	Not applicable to single public structures[4]

Notes:

[1] Other physical damages can be counted by adding appropriate damage percentages to the damage function for building or contents. These damages may be significant and thus counting them may add significantly to the total benefits. This type of mitigation project does not reduce damages to off-site utilities or transportation systems and no benefits should be counted for such other physical damages.

[2] Other physical damages are applicable only to acquisition or flood control infrastructure projects because mitigation projects to elevate or retrofit the primary structure have no impact on these other categories of damages - thus, there are no additional benefits.

[3] Casualties may be important for seismic hazard mitigation projects. Counting the benefits of avoided casualties may be a substantial fraction of total benefits and thus they should always be counted. Benefits of avoided casualties may also be important for hurricane and tornado mitigation projects because EOCs and emergency shelters are intended to be occupied during disaster events.

[4] Acquisition, elevation or retrofit of single public structures, does not significantly reduce a community's emergency management costs because the area affected by a disaster is not decreased, and the total population affected by disaster is not decreased or not decreased significantly.

5.1 Physical Damage Estimates for EOC and Emergency Shelter Buildings

Physical damage estimates for EOCs and emergency shelters are generally similar to those for ordinary buildings. If the EOC or shelter is designed to higher than normal building code standards, then professional judgement must be used to make appropriate estimates of damages, before and after mitigation.

Contents damage estimates for EOCs and emergency shelters are also generally similar to those for ordinary buildings. For EOCs, the extra value of communications and other EOC equipment must be considered in the analysis.

Acquisition projects are uncommon for EOC or shelters. However, if a mitigation project is acquisition or is a flood control infrastructure project that provides better flood protection for an EOC or shelter, other physical damages (landscaping, outbuildings, etc.) can also be counted. However, for typical mitigation projects for EOCs and shelters, that involve hardening of the building itself, there are no additional benefits in this category and they should not be counted.

5.2 Displacement Costs

In principle, the public services provided by EOCs and emergency shelters are subject to being displaced to temporary quarters due to disaster damages, just like any other public service. In practice, however, the operation of EOCs or emergency shelters is typically only for short periods of time immediately before, during, or after disaster events. Furthermore, because of the specialized, temporary function of EOCs and shelters, displacement to temporary quarters may not be physical possible, during the brief periods that EOCs and shelters would normally operate in a single disaster event. Typically, there is ample time between disasters to allow for repairs between uses of EOCs or shelters.

Because of the operating characteristics of EOCs and emergency shelters, the possible benefits of reduced displacement time are likely to be substantially less than for ordinary buildings. For ordinary buildings, the benefits of reduced displacement time generally constitute only a small fraction of total benefits. Thus, for EOC or emergency shelter mitigation projects the benefits of reduced displacement time are likely to be very minor. Except for mitigation projects that are very close to being cost-effective without counting the benefits of reduced displacement time, it may not be necessary to count displacement benefits for most mitigation projects for EOCs and emergency shelters.

5.3 Loss of Public Services for EOCs

In principle, the benefits of avoiding loss of public services provided by EOCs and emergency shelters are calculated from the daily cost of public services, just like any other public service. In addition, since EOCs and emergency shelters are critical facilities, an appropriate continuity premium must be added to reflect properly the greater importance of EOCs and emergency shelters during disasters.

5.3.1 Functional Downtime Estimates for EOCs and Shelters

Functional downtime estimates for EOCs and shelters are different from those for ordinary buildings because EOCs and shelters are typically used only for short periods of time before, during and/or after disaster events. Functional downtimes for EOCs and shelters cannot be longer than the typical duration of use.

5.3.2 Value of Services

As with any public building, the base value of the service provided by an EOC or shelter is estimated from the daily cost of providing the service. However, unlike other public services, EOCs and shelters are used only for brief periods of time before, during or after disaster events. For ordinary public buildings, the daily cost of service is estimated by dividing the annual operating budget of a facility by 365 days per year.

> **For EOCs the daily cost of service is estimated by dividing the annual operating budget by the typical or average number of days of use per year.**

For example, if an EOC has an annual operating cost of $36,500 per year and operates an average of only 2 days per year, based on historical data, then the average daily cost of service is $17,500 per day (when used). In this case, the average value of the EOC services is estimated at $17,500 per day. As with any public services, the annual operating budget for an EOC includes annual costs for equipment, supplies, utilities, administrative and training costs and other operating costs, as well as the salary and benefit-costs of personnel when the EOC is activated.

Rather than trying to estimate an annual operating budget for emergency shelters, a different approach is suggested for estimating the base value of emergency shelter. For Federal travel, the GSA establishes standard rates for lodging and meals. For the continental U.S., the base CONUS daily rates are $55 or lodging and $30 for meals and incidentals. Higher rates are published for counties with higher than these typical values (i.e., many medium- to large- urban areas). The simplest measure of the value of temporary lodging and meals provided by an emergency shelter would be $85 per day (the base CONUS rate). A more accurate measure could be obtained by using the GSA rate appropriate for the county in which the emergency shelter is located. Current GSA lodging and meals rates are available at several websites, including a DOD site (*www.dtic.mil/perdiem*).

> **For emergency shelters, the base daily value of the public service is estimated by multiplying the average number of people given shelter by the $85 per day CONUS value (or the appropriate local value of lodging and meals from the GSA data).**

5.3.4 Continuity Premiums for EOCs and Shelters

Determining an appropriate continuity premium for an EOC is difficult. In many ways, evaluating a mitigation project for an EOC is similar to evaluating a mitigation planning project. An EOC does not, by itself, directly reduce damages, losses, or casualties in a disaster. Rather, by coordinating response efforts, an EOC makes a community's disaster response more efficient and thus is beneficial to the community. Indirectly, an EOC may reduce damages by targeting and

implementing preventative measures more efficiently or reduce casualties by focusing search and rescue operations more efficiently.

Clearly, an EOC is important to a community during disasters. However, because of the indirect connection between and EOC and reductions in damages, losses, and casualties, it is difficult to estimate a suitable continuity premium. For consistency, we suggest assuming that a functioning EOC has the same continuity premium, relative to the cost of service, as police and fire services. This assumption then assigns a common continuity factor of 10 times the daily cost of services to each of the primary emergency response functions: police, fire and EOCs.

In a disaster, there are several reasons why emergency shelter is clearly worth more to residents and to the community than during ordinary times. First, hotels and motels are likely to be filled to capacity, or unavailable due to closures and/or damage. Second, emergency shelter is more important than discretionary temporary shelter. Discretionary travel and shelter can be postponed, but the need for emergency shelter is immediate and cannot be postponed. Third, there is a life safety impact of emergency shelter. Availability of safe emergency shelters in tornadoes and hurricanes reduces casualties because people move from less safe structures to safer emergency shelters. In hurricanes, the availability of shelters undoubtedly reduces the number of people who are at risk because they ignore evacuation warnings. That is, the availability of emergency shelter makes it more likely that people will evacuate when so ordered by local officials.

Estimating the value of emergency shelter to a community and determining an appropriate continuity premium depends primarily on common sense and professional judgement. Clearly, people displaced from their homes or evacuated would be willing to pay more than the normal cost of shelter and food - perhaps twice normal costs, or several times normal costs or even ten times normal costs, but not 100 or 1000 times normal costs. At 100 or 1000 times normal costs, the value per day of temporary shelter would be $8,500 or $85,000 per person per day, respectively, and clearly such numbers exceed the bounds of common sense for the typical or average value of emergency shelter in disasters.

For emergency shelters, a continuity premium similar to, but not larger than, those assigned to police and fire services and EOCs appears reasonable. Thus, a continuity premium of 10 times the normal cost of service for emergency shelters should be used.

5.4 Casualties

In some disaster events, occupants of EOCs and shelters may be at risk of injury or death. In estimating casualties, the occupancy characteristics of EOCs and shelters must be carefully considered. Methods for estimating casualties depend on whether or not the facility has alternative

uses during non-disaster times and whether or not the expected types of disasters occur with or without warnings.

For seismic hazard mitigation projects for EOCs and shelters, the appropriate occupancy value is the typical year-round occupancy for the normal function of the facility. In other words, casualty estimates are made in exactly the same manner as for any other building. For seismic mitigation projects, the best available casualty rate estimates are those in the FEMA-sponsored HAZUS program (HAZUS, Earthquake Loss Estimation Methodology, National Institute of Building Sciences and FEMA, 1997). HAZUS has consensus estimates of casualty rates for different structural types of buildings designed to several seismic design levels. However, using these estimates is possible if and only if a building's seismic vulnerability is expressed as a fragility curve. A fragility curve is a mathematical representation of a damage function expressed as the probabilities that a building will sustain a given level of damage as a function of the level of ground motion. Fragility curve-based estimates of casualty rates are the best available, but the necessary calculations are mathematically complex and should not be attempted by analysts not thoroughly familiar with this specialized mathematics and methodology.

For hurricane or tornado mitigation projects for EOCs and shelters, the appropriate occupancy value would be the occupancy during hurricane or tornado warnings, which may differ significantly from the normal occupancy of the facility. For hurricane winds and tornadoes, there are no currently available resources such as the earthquake HAZUS model to assist in casualty rate estimates. Rather, casualty rate estimates must be made for each building, based on the capacity of the specific building to withstand wind forces. In these circumstances, casualty rate estimates should always be made only in close consultation with an engineer very knowledgeable about the wind design characteristics of the existing building and the ability of the post-mitigation building to withstand wind forces.

For flood hazard mitigation projects for EOCs and shelters, life safety is generally not an issue and thus it is not necessary to make casualty estimates.

5.5 Summary Guidance

The major categories of benefits to be counted for mitigation projects for EOCs and emergency shelters are the same as those addressed for ordinary public buildings (Section 3) and for police, fire and medical facilities (Section 4). However, because of the function and occupancy characteristics of EOCs and shelters, there are several significant differences in benefit-cost analysis. These special considerations for EOC and shelter mitigation projects are highlighted in the summary Table 5.2 below.

Table 5.2
Special Considerations for Benefit-Cost Analysis
of Mitigation Projects for EOCs and Emergency Shelters

Types of Benefits to Consider	Data Sources and Guidance
1. Economic Impact of Loss of Function (i.e., Displacement Costs)	May not be applicable for EOCs and shelters, because of short period of use of these services.
▪ Displacement time	Maximum possible displacement times are limited by the typical duration of use of EOCs or shelters.
▪ Displacement costs	If appropriate, the extra costs of providing service from temporary locations.
2. Economic Impact of Loss of Function (i.e., Loss of Public Services)	
▪ Normal cost of service	▪ EOCs: daily base cost of service is annual operating budget divided by average number of days of use, plus daily costs during operation. ▪ Shelters: $85 per day CONUS cost of temporary lodging and meals or local GSA values.
▪ Functional downtime	Maximum possible displacement times are limited by the typical duration of use of EOCs or shelters
▪ Continuity Premiums	10 x cost of normal service, calculated as above, differently than for other public services
3. Casualties	
▪ Facility occupancy	▪ Earthquakes: normal occupancy for all functions ▪ Hurricanes and tornadoes: occupancy during warnings ▪ Floods: not necessary to estimate, minimal life safety benefits
▪ Casualty rates	HAZUS casualty rates for earthquakes, professional judgement for other hazards
▪ Statistical values of deaths, injuries, and illnesses	FEMA values, updated to 2001 values, see Section 2.3 - deaths: $2,710,000 - major injuries/illnesses: $15,600 - minor injuries/illnesses: $1,560

6.1 Overview

In the context of emergency planning, disaster response, and disaster recovery, utilities are often characterized as lifelines. This characterization reflects the great importance that such systems have on the functioning of modern society. For example, loss of electric power greatly reduces economic activity in a community, as well as having a direct and major impact on affected residents. Similarly, loss of function of water or wastewater systems generally has direct economic impacts on a community that are far larger than the cost of repairs of the physical damages alone

Electric power, potable water and wastewater systems are subject to physical damages from natural disasters such as earthquakes, hurricanes and floods. More importantly, however, such systems are subject to loss of function; that is, loss of utility service. Such loss-of-function disruptions often have major negative impacts on affected communities.

Hazard mitigation projects for utility systems may eliminate or reduce physical damages in future disasters. However, in many cases, an important motivation or even the primary motivation in undertaking hazard mitigation projects for utility systems is not to reduce the physical damages alone, but rather to reduce the tremendous impacts that the loss of function of such systems may have on the affected communities.

The basic concepts of benefit-cost analysis of mitigation projects for utilities are the same as those for buildings. The general principles and categories of benefits outlined in Section 2 apply to utilities as well as to ordinary buildings (Section 3) and critical facilities (Sections 4 and 5).

Mitigation projects for utility administration buildings are evaluated in the same manner as for an ordinary commercial or public building, as discussed in Section 3. Mitigation projects for utility control or command centers are evaluated in the same manner, except that a continuity premium should be added to reflect the importance of such centers in providing utility services. By analogy to the continuity premiums assigned to EOCs, a continuity premium of 10 times the normal cost of operations appears reasonable for utility control or command centers.

, Most mitigation projects for utilities, however, deal with the complex infrastructure of the utility systems and not with buildings.

> **The guidance in this section focuses specifically on mitigation projects for utility infrastructure (not on mitigation projects for utility buildings).**

Some of the details of benefit-cost analysis differ between mitigation projects for electric power systems, potable water systems, and wastewater systems. These details are discussed below. Benefit-cost analysis for all three of these utilities considers four primary categories of possible benefits, as

summarized below in Table 6.1. These are the same primary categories of benefits that were defined and discussed in Section 2.

Table 6.1
Primary Categories of Benefits
Mitigation Projects for Utilities.

Types of Benefits to Consider	Notes for Utility Mitigation Projects
1. Physical damages	Damage estimates made using professional judgement in consultation with those knowledgeable about utility system components and their vulnerability.
2a. Loss-of-Function Impacts (i.e., Displacement costs)	Not applicable to utility infrastructure mitigation projects; utility system components cannot be displaced to temporary quarters.
2b. Loss-of-Function Impacts (i.e., Economic impacts of loss of service)	▪ Economic impacts of loss of service are generally the largest category of benefits. ▪ See detailed guidance for each of the three utility systems evaluated.
3. Casualties	▪ May be significant for some types of projects, for some utility systems, for some hazards. ▪ See detailed guidance for each of the three utility systems evaluated.
4. Emergency Management Costs	▪ Not generally considered. ▪ Most utility mitigation projects have a negligible impact on a community's overall emergency management costs.

6.2 Physical Damage Estimates

Utility systems contain a wide range of highly specialized components. Electric power systems have generating plants, transmission and distribution lines, high voltage substations and a host of specialized ancillary equipment. Potable water systems have storage reservoirs, storage tanks, wells, treatment plants, aqueducts and transmission pipes, distribution pipes, pumping plants, valves and a host of specialized ancillary equipment. Wastewater systems have treatment plants, systems of collection pipes, pumping plants (lift stations) and a host of specialized ancillary equipment.

Because of the complex, technical, and specialized nature of the components of utility infrastructure systems, damage estimates should always be made in close consultation with qualified individuals familiar with the specific systems under evaluation.

6.3 Functional Downtime Estimates

Functional downtime estimates for utility systems differ fundamentally from functional downtime estimates for buildings because of the network characteristics of utility systems. In order for an electric power or potable water or wastewater system to deliver service and to function as intended, a myriad of interconnected components has to work together as designed. Utility system networks are generally described in terms of links and nodes. Links are the lines or pipes that connect the other elements of the system, defined as nodes. Nodes include generating plants, treatment plants, substations, pumping plants and other facilities that are necessary to provide utility service.

In complex, networked utility systems, some components may be redundant; that is, there is an alternative, functionally equivalent component that can serve the same function if the first component fails. Other components are unique; that is, alternative components are not available if the first component fails. Therefore, the extent of loss of utility service that results from specific levels of damage depends on the detailed network operating characteristics of each specific utility system. For example, damage to one substation or pumping plant might result in little or no loss of function if the component is redundant. However, the same level of damage to another substation or pumping plant might result in loss of service to an entire neighborhood or city.

Because of the networked nature of utility systems, estimating functional downtime requires a thorough understanding of the network operating characteristics of the specific utility system under evaluation. Functional downtime estimates for utility systems should always be made in conjunction with qualified individuals knowledgeable about the specific utility system under evaluation and in close cooperation with local utility staff.

For utility systems, functional downtimes are best expressed as “system days” of lost service. A “system day” of lost service is defined as one day in which the entire system is without service. However, system days are usually fractional. For example, one system day may be one day of complete loss of service, or two days with 50% loss of service, or 10 days with 10% loss of service, and so on. Loss of service is generally defined as the percentage of customers without service. For example, if 20% of a utility’s customers have no service for 2 days, with 5% having no service for a third day, then the functional downtime is 0.45 system days. In this example the system days are calculated as 20% (0.20) times two days plus 5% (0.05) times one day or 0.45 days.

6.4 Economic Impact of Loss of Utility Services

The economic impact of loss of utility services is analogous to estimating the impact on a community of loss of public services provided from a building. The estimated economic impacts of loss of utility services differ for electric power systems, potable water systems, and wastewater systems. Thus, guidance for each of these types of utility systems is presented separately.

6.4.1 Economic Impacts of Loss of Electric Power

The base economic value of electric power is the cost of service. Recent data from the U.S. Department of Energy show a national average price of electricity of 6.74 cents per kilowatt-hour. However, electric power is extremely important for the functioning of a modern community. The economic impacts of loss of electric power are far greater than the simple cost of electric power. The primary motivation for most mitigation projects for electric power is to minimize the loss of electric power service to the community. Reductions in damage to the electric power system are an important objective, but generally secondary to preserving the delivery of electric power to the community.

The direct economic impact of loss of electric power is estimated from nationwide data on economic activity by sector of the economy (1997 Economic Census, North American Industry Classification System, and NAICS). These data were combined with electric power importance factors for each major economic sector. These importance factors reflect the reality that different sectors of the economy have varying degrees of dependence on electric power. Importance factors were taken from the FEMA-sponsored publication ATC-25 (Applied Technology Council, Seismic Vulnerability and Impact of Disruption of Lifelines in the Conterminous United States, 1991). These estimated economic impacts include both wage and business income losses.

For purposes of benefit-cost analysis, the economic impacts calculated as described in the previous paragraph were updated to 2000 values and then adjusted downwards. The downwards adjustments were made because: 1) some facilities have on-site generation or back-up power sources, 2) some lost economic production can and will be made up after restoration of electric power, and 3) there is a high potential for double-counting of reasons for the loss of economic production. With these corrections, the direct economic impact of loss of electric power is estimated to be $87 per capita per day. Following this approach, the direct regional economic impact of one system day of complete loss of electric service for a community of 100,000 people would be estimated at $8,700,000 (100,000 times $87).

In addition to these regional economic impacts, loss of electric power service also has direct economic impacts on residents, separate from the regional economic impacts estimated above. Examples of these impacts include food spoilage during prolonged outages, extra costs for meals or temporary lodging for some people, water damages due to frozen pipes and so on. Rough, common sense estimates outlined in the Supporting Documentation Volume Chapter 3 (to be available in late 2001) suggest that these impacts may total about $30 to $35 per capita per day, on average.

In addition, there is an economic value to the major disruption of normal activities that result from loss of electric power. The key point is that people's time has economic value, whether such time is devoted to remunerative work or to personal leisure and recreation.

The estimated economic value per person per hour of disruption from loss of electric power is estimated using an approach similar to that used by the U.S. Department of Transportation (DOT) for highway planning purposes. Technical details of this approach are given in the DOT memo: The Value of Travel Time: Departmental Guidance for Conducting Economic Evaluations (U.S. Department of Transportation, memo from Frank E. Kruesi, Assistant Secretary for Transportation Policy, April 9, 1997).

The simplest assumption consistent with economic theory is that each hour of people's time is worth the same amount, whether such time is personal or business time. In other words, the last hour of work time and the first hour of leisure or recreation time are assumed to have equal value. This is the assumption that should be used when valuing the direct economic impact of the disruption time for residents subjected to electric power outages.

Following the DOT approach, the average hourly compensation rate (wages and benefits) is the best available measure of the economic value of people's time. The latest available data, for March 2000, of average employer cost for employee compensation for civilian workers (private industry and state and local government) is $21.16 per hour (U.S. Department of Labor, Bureau of Labor Statistics News, USDL: 00-186, June 29, 2000). A value of $21.16 per person per hour should be used as the value for the economic impact of disruption time for customers subject to loss of electric power service.

Loss of electric power has a major disruptive impact on residential customers. The impacts include loss of lighting and in many cases loss of cooking capability, hot water and heating. Almost all normal daily activities, including preparing food, cleaning, reading, watching television, listening to music, and using computers, are disrupted. As a conservative estimate, such disruptions total at least 3 to 4 hours per person per system day of electric power outage. At slightly more than $21 per hour, such disruption of normal activities would add $63 to $85 per capita per day to the estimated direct economic impacts of $30 to $35 for residential customers estimated above. The resulting total estimated economic impacts for residential customers are approximately $93 to $110 per capita per day. The midpoint of this range of estimates is $101 per day per person.

Combining the estimated impact of losing electric power on regional economic activity and the estimated impact on residential customers yields a total estimated impact of $187 per person per day of lost service. These estimates are summarized below in Table 6.2.

Table 6.2
Economic Impacts of Loss of Electric Power
Per Capita Per Day

Category	Estimated Economic Impact
Reduced regional economic activity[1]	$87
Impacts on Residential Customers	
▪ Direct economic losses	$30 to $35
▪ Disruption economic impact	$63 to 85
▪ Total Best estimate	$101
Total economic impacts	**$188**

[1] This value of reduced regional economic activity is based on national economic data. If desired, more detailed estimates could be made for specific metropolitan areas using NAICS data in the economic census referenced above.

As an example, consider a community of 40,000 people that suffers a partial loss of electric power due to flood damage at one substation. If 50% of the customers have no power for 1 day, 15% have no power for an additional day, and 5% have no power for two additional days, then the number of system days of loss of power is calculated as 0.50 times 1 plus 0.15 times 1 plus 0.05 times 2 or 0.75 system days. With 0.75 system days of lost service, total economic impacts of $188 per person per day and 40,000 customers, the total economic impacts are calculated as 0.75 times 40,000 times $188 or $5,640,000.

6.4.2 Economic Impacts of Loss of Potable Water

The economic impacts of loss of potable water service are estimated in the same manner as for electric power service above. For potable water systems, two levels of loss of service are evaluated: 1) complete loss of water service, and 2) water unsafe for drinking.

The impact of loss of water service on regional economic activity is estimated using nationwide economic data by economic sector and water importance factors from the same sources as referenced in Section 6.4.1. The economic impact of loss of water service is large, but smaller than that for electric power. For complete loss of water service, and water unsafe for drinking, the regional economic impacts are estimated at $35 and $8.75 per person per day, respectively.

In addition to these regional economic impacts, loss of potable water service also has direct economic impacts on residents, separate from the regional economic impacts estimated above. Examples of these impacts include costs of bottled water for drinking, cleaning and sanitation purposes, increased meal costs for restaurant meals, temporary lodging for some people, increased transportation costs to obtain water, meals, and sanitation facilities and so on. Prolonged outages could also cause landscaping damage in climates where irrigation is necessary. Rough, common sense estimates outlined in the Supporting Documentation Volume (Chapter 4) (to be available in late 2001) suggest that these impacts may total about $15 per capita per day, on average.

In addition, there is an economic value to the major disruption of normal activities that result from loss of potable water service. As described in Section 6.4.1, people's time has economic value, whether such time is devoted to remunerative work or to personal leisure and recreation. As a conservative (lower bound) estimate, we suggest that such disruptions would total about 2 to 3 hours per person per system day of complete loss of water service. At about $21 per hour (the average hourly wage, as described in Section 6.4.1), the economic impact of such disruption would add $42 to $63 per day to the estimated direct economic impacts of $15 per day. The resulting total estimated economic impacts of complete loss of water service for residential customers are approximately $57 to $78 per day. The midpoint of this range is about $68 per person per day.

For loss of water quality, such that water is unsafe for drinking, the estimated economic impacts on residential customers are about 50% of the estimates for complete loss of service, or about $34 per person per day.

The above estimates of the economic impact of loss of potable water service apply to all types of natural hazard events. For earthquakes, there are additional potential losses arising from fire following the earthquake event. Earthquakes commonly cause fire ignitions, due to building damage, downed power lines, and gas line breaks. For earthquake-induced fires, loss of water service reduces fire suppression capability and leads to a statistical expectation of higher fire losses. The extent of fire following earthquake losses arising from loss of water service is possible to model mathematically, with inputs on building stock, building density, climate and wind conditions, and fire suppression capability. As a first level estimate, fires following earthquake losses due to loss of water service are estimated at $35, $17.50, and $8.75 per person for dry, moderate and wet climates, respectively.

Fire following earthquakes occurs predominantly during the first few hours or first day after a major earthquake, although some ignitions may occur later. For example, reconnecting gas lines may lead to fires if leaks are present in the distribution lines.

Loss of water service also reduces fire suppression capability for normal fires, but such fires are relatively infrequent. Thus, the effective number of days of functional downtime to be considered for fire following earthquake should logically be capped at a smaller number than the total system restoration time.

For purposes of benefit-cost analysis, a maximum of one system day should be used for estimating fire following earthquake losses.

Table 6.3
Economic Impacts of Loss of Potable Water Service
Per Capita Per Day

Category	Complete Loss of Water Service	Water Unsafe for Drinking
Reduced regional economic activity[1]	$35	$8.75
Impacts on Residential Customers		
▪ Direct economic losses	$15	$7.50
▪ Disruption economic impact	$42 to 63	$21 to 42
▪ Total Best estimate	$68	$34
Total economic impacts (all hazards)	$103	$43
Fire following earthquake losses		
▪ Dry climates	$35	None
▪ Moderate climates	$17.50	None
▪ Wet climates	$8.75	None

[1] This value of reduced regional economic activity is based on national economic data. If desired, more detailed estimates could be made for specific metropolitan areas using NAICS data in the economic census referenced above.

The estimated economic impacts of loss of water service, as summarized above in Table 6.3 are large, but somewhat lower than those for loss of electric power.

As an example, consider a community of 500,000 people that has a partial loss of potable water service in an earthquake. The loss of service is primarily because of pipe breaks in the distribution system, coupled with minor damage at pumping plants. If 20% of the customers have no power for 1 day and 5% have no power for an average of three additional days, then the number of system days of loss of potable water service is calculated as 0.20 times 1 plus 0.05 times 3 or 0.35 system days. With 0.35 system days of lost service, total economic impacts of $103 per person per day and 50,000 people affected, the total economic impacts are calculated as 0.35 times 500,000 times $103 or $18,025,000.

In this example, there are also earthquake-induced fires resulting from the loss of water service. The community is a moderate climate. The fire losses only occur on the first day (0.20 system day of lost service); therefore the estimated fire losses are 0.20 times 500,000 times $17.50 or $1,750,000. In this example, fire losses are slightly less than 10% of the total estimated economic impacts of loss of water service.

6.4.3 Economic Impacts of Loss of Wastewater Service

The economic impacts of loss of wastewater service are estimated in the same manner as for electric power and potable water service above. A detailed examination of the economic impacts of loss of wastewater service is given in the Supporting Documentation Volume (Chapter 5) (to be available in late 2001). A brief summary is presented below.

The impact of loss of wastewater service on regional economic activity is estimated using nationwide economic data by economic sector and water importance factors from the same sources as referenced sections 6.4.1 and 6.4.2. The economic impact of loss of wastewater service is large, similar to that for potable water, but smaller than that for electric power. The regional economic impacts of loss of wastewater service are estimated at $33.50 and $8.50 per person per day for complete loss of treatment and partial loss of treatment, respectively.

As discussed above in Sections 6.4.1 and 6.4.2, loss of electric power and potable water services has direct impacts on residential customers, separate from the impacts on regional economic activity. For wastewater services, however, impacts on residential customers are generally non-existent or negligible. Temporary loss of wastewater treatment capability (complete or partial loss of treatment) does not generally interrupt residential customer's ability to dispose of sewage or other wastewater.

The above estimates of the economic impact of loss of potable water service apply to all types of natural hazard events. These estimates are summarized below in Table 6.4

Table 6.4
Economic Impacts of Loss of Wastewater Service
Per Capita Per Day

Category	Complete Loss of Treatment	Partial Loss of Treatment
Reduced regional economic activity[1]	$33.50	$8.50
Impacts on Residential Customers		
▪ Direct economic losses	None	None
▪ Disruption economic impact	None	None
▪ Total Best estimate	None	None
Total economic impacts (all hazards)	**$33.50**	**$8.50**

[1] This value of reduced regional economic activity is based on national economic data. If desired, more detailed estimates could be made for specific metropolitan areas using NAICS data in the economic census referenced above.

The estimated total economic impacts of loss of wastewater service, as summarized above in Table 6.4are large, but significantly smaller than those for loss of potable water or electric power service.

As an example, consider a community of 27,000 people with flood damage to a wastewater treatment plant. There is complete loss of service for 2.5 days and then partial loss of treatment capability for an additional 5 days. These losses of service affect the entire community. The estimated economic impact of complete loss of service for 2.5 days is 2.5 times 27,000 times $33.50 or $2,261,250. The estimated economic impact of partial loss of service for 5 additional days is 5.0 times 27,000 times $8.50 or $1,147,500. The total estimated economic impact of loss of wastewater services is $3,408,750.

The above analysis does not explicitly consider environmental impacts of loss of wastewater treatment services. Discharge of untreated or partially treated wastewater has potential negative environmental impacts. Flooding of wastewater treatment plants is the most common reason for loss of wastewater treatment services. Discharges of untreated or partially treated wastewater most commonly occur during periods of high water flows, when dilution of wastes is maximized and potential environmental impacts (are minimized.

The scope of the present guidance does not include evaluating environmental damages or the benefits of reducing or avoiding such damages. However, in effect, such environmental impacts are partially considered in the present analysis of the economic impacts of loss of function of wastewater treatment facilities, as described below.

The analysis of the regional economic impacts of loss of wastewater services implicitly assumes that business activity will be curtailed during periods of loss of wastewater service. When wastewater services are lost, communities sometimes impose operating restrictions on industrial and large commercial facilities to reduce the inflow of waste. More commonly, however, communities simply discharge partially treated or completely untreated waste.

In making a public policy decision to discharge partially treated or completely untreated waste, rather than to impose drastic restrictions to curb waste inflows, communities are implicitly deciding that possible environmental impacts are less than the economic losses that would arise from imposing more drastic reductions to curb waste inflows. To the extent that communities choose to release completely untreated or partially treated waste instead of curbing economic activity to reduce waste inflow, the estimated regional economic impacts of loss of wastewater service, as outlined above, will be over-estimated.

Following the above analysis, the estimated regional economic impacts of loss of wastewater treatment services probably overestimate the actual economic impacts. However, the estimated regional economic impacts implicitly are deemed equal to or greater than possible environmental damages. In effect, possible environmental impacts are counted indirectly (at least roughly) in the proposed methodology for estimating regional economic impacts.

6.5 Casualties

Loss of function of utilities - electric power, potable water and wastewater - has potential life safety impacts on affected communities. In some cases there may be deaths, injuries or illnesses arising from loss of utility services.

Loss of electric power may result in casualties. However, facilities for which electric power is a critical life safety issue (such as acute care in hospitals) always have redundant backup power supplies (e.g., battery back-ups and emergency generators). An upper bound analysis of potential casualties due to loss of electric power in Chapter 3 of the Supporting Documentation Volume (to be available in late 2001), suggests that the economic value of casualties is likely to be well below $2.50 per person per day of lost service. This upper bound value is very low compared to the estimated economic impacts of loss of electric power, $188 per person per day, and thus may be ignored as negligible for benefit-cost analysis. Actual casualties are likely to be less than these upper bound estimates.

Loss of potable water service may also result in casualties, most commonly illness from drinking contaminated water. Deaths from contaminated water are possible, but extremely rare. A rather extreme upper bound analysis of potential casualties due to loss of potable water service in Chapter 4 of the Supporting Documentation Volume (to be available in late 2001), suggests that the economic

value of deaths is likely to be well below $2.50 per person per day of lost service, with the economic value of illnesses likely to be well below $1.50 per person per day. These upper bound values is low compared to the estimated economic impacts of loss of potable water service, $103 per person per day, and thus can probably be ignored as negligible for benefit-cost analysis. Actual casualties are likely to be less than these upper bound estimates.

Loss of wastewater service also has the potential for casualties, most commonly illness from drinking or exposure to contaminated water. However, any such illnesses are likely to be much less than those estimated above for potable water systems, since few people are likely to drink raw untreated water. Casualties arising from loss of function of wastewater treatment plants appear to be negligible for purposes of benefit-cost analysis.

6.6 Summary Guidance

The basic concepts of benefit-cost analysis of mitigation projects for utilities are the same as those for buildings (as discussed in previous sections). Significant differences are as follows:

Physical damage estimates for utility systems must be estimated by qualified individuals thoroughly familiar with the specific utility systems under evaluation, based on historical damage data, professional judgement and engineering calculations.

Displacement costs are not applicable to utility systems, since utility system components cannot be displaced to temporary quarters. Displacement costs should not be counted in benefit-cost analysis of mitigation projects for utility systems.

Loss of function of utility services has a great economic impact on regional economic activity in general and residential customers in particular. In addition, for loss of potable water service in earthquakes, there are additional losses due to fires following earthquakes. These economic impacts are summarized in Table 6.5 below.

Table 6.5
Economic Impacts of Loss of Utility Services per Person Per Day of Lost Service

Loss of Electric Power	Cost of Complete Loss of Service	
Reduced Regional Economic Activity[1]	$87	
Impacts on Residential Customers	$101	
Total Economic Impact	**$188**	
Loss of Potable Water Service	**Cost of Complete Loss of Service**	**Cost of Water Unsafe for Drinking**
Reduced Regional Economic Activity[1]	$35	$8.75
Impacts on Residential Customers	$68	$34
Total economic impact (all hazards)	**$103**	**$43**
Fire Following Earthquake Losses	**Cost of Fire Damage**	
- Dry Climates	$35	
- Moderate Climates	$17.50	
- Wet Climates	$8.75	
Loss of Wastewater Service	**Cost of Complete Loss of Service**	**Cost of Partial Treatment Only**
Reduced Regional Economic Activity[1]	$33.50	$8.50
Impacts on Residential Customers	None	None
Total Economic Impact	**$33.50**	**$8.50**

[1] This value of reduced regional economic activity is based on national economic data. If desired, more detailed estimates could be made for specific metropolitan areas using NAICS data in the economic census referenced above.

7.1 Overview

In the context of emergency planning, disaster response, and disaster recovery, roads and bridges are often characterized as lifelines. This characterization reflects the importance that roads and bridges have on the functioning of modern society. Especially in a disaster, roads and bridges are often critical for disaster response and evacuation.

Roads and bridges are subject to physical damages from natural disasters such as earthquakes, hurricanes and floods. More importantly, however, roads and bridges are subject to loss of function; that is, closure to traffic. Such closures often have significant negative impacts on affected communities.

Hazard mitigation projects for roads and bridges may reduce physical damages in future disasters. However, in many cases, an important motivation or even the primary motivation in undertaking hazard mitigation projects for roads and bridges is not to reduce the physical damages alone, but rather to reduce the negative impacts that the closures of roads and bridges may have on the affected communities. That is, mitigation projects for roads and bridges are often focused primarily on keeping the roads and bridges open during disaster events.

The basic concepts of benefit-cost analysis of mitigation projects for roads and bridges are the same as those for buildings and are summarized in Table 7.1. The general principles and categories of benefits outlined in Section2 apply to roads and bridges as well as to ordinary buildings (Section3), critical facilities (Sections4 and 5), and utilities (Section6).

Table 7.1
Primary Categories of Benefits
Mitigation Projects for Roads and Bridges

Primary Categories of Damages/Benefits	Notes for Utility Mitigation Projects
1. Physical Damages	Damage estimates must be made by engineers knowledgeable about roads and bridges and their vulnerability to each type of hazard.
2a. Loss-of-Function Impacts (i.e., Displacement costs)	Not applicable to road and bridge mitigation projects; roads and bridges cannot be displaced to temporary quarters.
2b. Loss-of-Function Impacts (i.e., Economic impacts of loss of service)	Economic impacts of road or bridge closures are the generally the largest category of benefits; see detailed guidance in this section.
3. Casualties	Not generally significant, except for seismic mitigation projects for bridges.
4. Emergency Management Costs	Not generally considered; most road and bridge mitigation projects have a negligible impact on a communities overall emergency management costs

7.2 Physical Damage Estimates

Roads and bridges vary in their materials and designs. The vulnerability of roads and bridges to flood, wind, or seismic damage varies drastically depending on the type of components, their age, their design and condition. As such, it is necessary to make facility-specific estimates based on historical damage data and professional judgement. Because of the somewhat specialized nature of road and bridge engineering, damage estimates should always be made in close consultation with qualified individuals thoroughly familiar with the specific components under evaluation.

7.3 Functional Downtime Estimates

Functional downtime estimates for roads and bridges are somewhat different than for buildings or utilities. For roads and bridges there are two aspects of functional downtime. The first aspect is the closure time or the time period during which the road or bridge is closed to normal traffic while

repairs are made. Closure times may range from a few hours to several days to several weeks in unusual cases. The second aspect is the delay or detour time. Delay or detour time is the average amount of extra time that motorists spend taking alternative routes because of road or bridge closures. Delay or detour time may be only a few minutes if an alternative route is only a block or two away. Typically delay or detour times are fractions of an hour. In rare cases, delay or detour times may be an hour or more if, for example, a bridge is closed and the nearest alternative bridge is a long distance away.

For road and bridge closures, functional downtime is expressed in two steps:

1. Estimate the number of days for the damaged road or bridge to be repaired and reopened to normal traffic flow
2. Estimate the average delay or detour time for motorists while the bridge is closed.

For example, assume that a culvert fails in a flood and a road is washed out. A county highway department estimates that the repair time is one week and that the average delay or detour time caused by the closure is about 20 minutes. When a disaster event causes numerous road or bridge closures, repairs are almost always made first to the most important roads or bridges. Thus, secondary or rural roads and bridges are generally expected to have longer closure times than primary roads.

Estimates of repair times and delay or detour times are made based on historical data and experience. Local highway department staff is generally very experienced with closures and is the best source of repair time estimates and delay or detour times.

7.4 Economic Impact of Road and Bridge Closures

The economic impact of road and bridge closures is analogous to estimating the impact on a community of loss of public services provided from a building. Closure of a road or bridge represents loss of a public service - the availability of a transportation route.

The economic impact of road and bridge closures is estimated from the number of vehicles per day using the route, the average delay or detour time, and the average value of people's time. The primary economic impact of road and bridge closures is loss of time.

There are four steps in estimating the direct economic impacts of road or bridge closures:

1. Estimate the functional downtime; that is, the repair time to restore normal traffic flow on the road or bridge

2. Determine the average daily traffic count for the closed road or bridge
3. Estimate the average delay or detour time arising because of the closure
4. Place a typical or average dollar value per person hour or per vehicle hour of delay or detour

Each of these steps is discussed in detail below.

7.4.1 Functional Downtime (Repair Time) for Roads and Bridges

For roads and bridges, functional downtime is the time period for which the road or bridge is closed to normal traffic flow. For a given road or bridge that is damaged in a disaster event, the repair time depends on the severity of damage, on the number of other damaged roads or bridges, and, very importantly, on the priority placed on repair and reopening by the local highway department. When there are multiple outages, local highway departments almost always prioritize repairs so that the most important roads or bridges are reopened first. Small residential or rural roads are likely to be repaired much later than major arteries with high traffic flows.

Repair times can range from a few hours if there are only a few outages, to several days to several weeks, depending on the number of damaged roads or bridges. Repair times are very rarely longer than two or three weeks, except for major bridge structures, which might take many months or even a year or two to replace if destroyed.

Estimating repair times requires somewhat specialized knowledge of the local highway transportation system, of the availability of local resources, and of local priorities, and is thus best made in close cooperation with local traffic officials.

7.4.2 Average Daily Traffic Counts

Average daily traffic counts for most roads or bridges are available from local highway officials. Traffic counts are used for road/bridge design purposes and for traffic control, planning and management purposes. Local highway officials generally can provide actual traffic counts for specific segments of roads or bridges, or at least reasonable estimates based on traffic counts for similar nearby roads and bridges.

Traffic counts are usually presented as the number of vehicles per day or per hour. Traffic counts may be presented as total vehicles or separately for different classes of vehicles (e.g., cars, light trucks, heavy trucks). Traffic counts are usually presented as the number of single (one-way) trips,

but are sometimes presented as the number of round trips. The difference between one-way and round-trip counts is important and the unit of measure (one-way or round-trip) must always be noted carefully.

7.4.3 Average Delay or Detour Times

When a given road or bridge is closed because of high water, unsafe conditions, or physical damage, the delay or detour varies markedly, depending on local conditions. Delay or detour times can range from five minutes or less to several hours (in rare cases).

Road and systems are networked systems of interconnected elements. In, networked systems, some elements may be redundant; that is, alternative paths may be available if such elements fail. Other elements may be nearly unique; that is, no practical alternative paths are available. The extent of loss of function that results from specific damage depends on the characteristics of each specific road and bridge system. For example, damage that closes one city street may have very little impact on traffic if the resulting detour is only one city block while repairs are made. However, closure of a rural road or a bridge may result in a substantial detour (duration and mileage) with a correspondingly significant economic impact.

The length of delay or detour that is likely to result from the closure of a particular road or bridge depends entirely on specific local conditions and so no generalizations can be drawn. The length of delay or detour depends on:

The traffic count for the closed road or bridge

The layout of the local road and bridge system (what alternative routes are available, how suitable the alternative routes are, how heavy the normal traffic is on these routes, and the distance between the closed road or bridge and the alternative route)

Local highway officials are the best source of delay or detour time estimates. Local highway officials have knowledge of past closures, of what detours or alternative routes are available, and knowledge of the local road and bridge system and local traffic patterns. Estimated delay or detour times will never be exact and will vary depending on the time of the day and on the day of the week. However, knowledgeable local highway officials should be able to make reasonable estimates: Will closure of this bridge result in a 5 minute detour, a 30 minute detour, or a several hour detour?

7.4.4 Economic Impact Per Person Per Hour of Delay or Detour Time

The economic impacts of road or bridge closures are estimated by combining the number of days of road or bridge closure, the average daily number of vehicles using the road, the average delay or detour time per vehicle, and the estimated economic value per person per hour of delay or detour.

The estimated economic value per person hour of delay or detour is estimated using an approach similar to that used by the U.S. Department of Transportation (DOT) for highway planning purposes (The Value of Travel Time: Departmental Guidance for Conducting Economic Evaluations, U.S. Department of Transportation, memo from Frank E. Kruesi, Assistant Secretary for Transportation Policy, April 9, 1997).

The DOT memo referenced above has a detailed analysis of economic theory and references to its approach. For the present purposes, a condensed summary of the analysis is presented. The key point is that time saved from travel has economic value, whether such time is devoted to remunerative work or personal leisure/recreation. Furthermore, if travel is associated with unpleasant conditions of crowding (or delays and detours), exposure to weather, risk, effort or boredom, cutting the time it requires will be beneficial. In simple terms, people would, on average, be willing to pay something to avoid such unpleasant travel conditions.

The simplest assumption consistent with economic theory is that each hour of time lost in travel delays or detours is worth the same amount, whether such time is personal or business time. In other words, the last hour of work time and the first hour of leisure/recreation time are assumed to have equal value. This is the assumption that should be used for valuing the direct economic impact of the time lost by closures of roads and bridges. For benefit-cost analyses of FEMA-funded hazard mitigation projects, 100% of the national average hourly wage (plus benefits) should be the value of travel time lost by road and bridge closures. As described in Section 6.4.1, the average employer cost for employee compensation is $21.16 per hour according to U.S. Department of Labor.

The U.S. DOT also has data on average vehicle occupancies. For 1996, the total highway passenger miles were 3.962 trillion. A passenger mile is one person traveling one mile by automobile, motorcycle, light truck, heavy truck, or bus. For 1996, the total highway vehicle miles were 2.482 trillion. The ratio of these two numbers, 1.596 is the average vehicle occupancy. Applying this occupancy value and the $21.16 per person per hour value derived above yields a value of $33.78 per vehicle hour of lost travel time.

The U.S. Census Bureau population estimate for November 2000 indicates that 74.47% of the population is 18 or over, with 25.53% under 18. If these ratios are applied to the average vehicle occupancy, assuming that drivers are 18 or over, then the average vehicle occupancy is 1.444 adults

and 0.152 children under 18. This estimated proportion of adult and child passengers does not consider that some drivers are under 18 (about 3% of the total population is between 16 and 18) but this is offset by the fact that the proportion of children as passengers is likely lower than in the population as a whole, because there are few children as passengers for commuting or business travel. Combining these data, we estimate that the average vehicle occupancy is about 1.45 adults and 0.15 children.

If lost time for children were assumed to have no economic value (a somewhat extreme assumption), then the estimate of $33.78 per vehicle hour of lost travel time would be reduced by nearly 10% to $30.68. More reasonably, lost time for children has an economic value, but less than that for adults. Taking the midpoint of these two extremes (counting children's lost time the same as adults or counting children's lost time at zero) yields an estimate of $32.23, which appears to be a reasonable estimate. Thus, the average economic value of lost travel time as $32.23 per vehicle hour of delay or detour due to road and bridge closures.

The above analysis considers all traffic to be of equal economic value. However, there are two other possible economic impacts from closures of roads and bridges that need to be evaluated for possible inclusion in benefit-cost analysis, namely:

1. Economic impacts for commercial traffic
2. The impact of road and bridge closures on emergency vehicles

For commercial travel (including heavy trucks) the analysis presented above includes only the value of the driver's time. As discussed above, typical delay or detour times are short, on the order of a few minutes to perhaps an hour or two. For such short delays there are unlikely to be major economic impacts such spoilage of perishables goods or interruption of normal economic activity. Therefore, no adjustments for commercial traffic need be made.

For emergency vehicles, the delay or detour times may increase the response time and thus lower the quality of emergency response. However, the fraction of normal traffic that is emergency vehicles is extremely small, a very small fraction of 1% of total traffic. Furthermore, delays and detours may be shorter for emergency vehicles as such vehicles typically have expedited access to the transportation system and some emergency response vehicles have off-road capabilities or higher ground clearances and thus can travel on roads closed to normal traffic. Thus, the impact of road and bridge closures on emergency vehicle response is assumed to be minor.

For purposes of benefit-cost analysis, the economic impact of road or bridge closures is estimated as $32.23 per vehicle hour of delay.

7.5 Casualties

Failure of a road or bridge may occasionally result in deaths or injuries from vehicular accidents at the failure location. However, such incidents are extremely rare. Closure of a road or bridge, or even a major washout of a section of road or complete washout of a bridge very rarely results in casualties. Historical experience suggests that deaths from such accidents would be many times less than 1 person per 1,000,000 in a community affected by a typical road or bridge closure. Based on the statistical value of human life (deaths and injuries), such rare incidents are generally negligible compared to the economic impact of delay and detour times discussed above.

The statistical value of casualties avoided may be important for one type of hazard mitigation project: seismic retrofit of bridges subject to collapse in earthquakes. For example, if one of the approximately 300-foot long segments of the Bay Bridge between Oakland (CA) and Treasure Island were to fail completely in an earthquake, the expected death rate would be a very high percentage of the average "occupancy" of the bridge segment. For high traffic bridges that could be subject to complete failure in earthquakes, the value of casualties avoided should be evaluated individually for each mitigation project.

Estimating casualty rates from bridge failures from earthquakes requires professional judgement. Such estimates should be made in close consultation with seismic engineers thoroughly familiar with seismic bridge engineering.

7.6 Summary Guidance

The suggested approach for benefit-cost analysis of hazard mitigation projects for roads and bridges has five steps, each of which must be done for both the before and after mitigation states of the road or bridge, as a function of the severity of disaster:

1. Estimate the physical damages to road or bridges in dollar terms
2. Estimate the repair time to restore normal traffic flow,
3. Estimate the average delay or detour time
4. Obtain the average daily traffic count for the road or bridge
5. Calculate the economic impacts of loss of function of the road or bridge, using the above data and the per vehicle per hour value of lost travel time of $32.23

For floods, these estimates are made as a function of flood depth or flood frequency. For hurricanes or earthquakes, these estimates are made as a function of wind speed or peak ground acceleration

(PGA), respectively. Data sources and guidance for making these estimates calculations are summarized in Table 7.2 below. For earthquakes only, the additional category of casualties losses is also considered for bridge mitigation projects.

Table 7.2
Summary Guidance for Benefit-Cost Analysis
of Hazard Mitigation Projects for Roads and Bridges

Parameter	Data Sources
1. Physical damages to road or bridge	Historical data and professional judgement from individuals knowledgeable about roads and bridges
2. Repair time to restore normal traffic flow	Historical data and professional judgement or estimates from local traffic officials
3. Average delay or detour time	Historical data or estimates from local traffic officials
4. Average daily vehicle count	Historical data or estimates from local traffic officials
5. Economic impact of road or bridge closure	$32.23 per vehicle hour of delay or detour

As an example, consider a situation in which a culvert washout closes a road until repairs are made. For benefit-cost analysis, estimates are made of the physical damage costs and loss-of-function economic impacts for each flood depth or flood frequency, both before and after mitigation. As an example, we show a typical calculation of the damages and losses before mitigation for one flood frequency (a 25-year event).

Example

Physical damages, the actual cost t repair the road and culvert, are estimated from historical sources to be **$6,500**. Local traffic officials estimate the number of days of closure to be **3 days**, the average delay or detour time to be **30 minutes**, and the average daily vehicle count to be **1,200**.

To determine the economic impact of the road closure, we take the product of the repair time (3 days), average delay or detour time (0.5 hours), average daily vehicle count (1,200 vehicles per day), and the cost per vehicle hour of the delay or detour ($32.23) (see Table 7.2), or:

3 x 0.5 x 1,200 x $32.23 =	$58,014	for the economic impact of the road closure.
Add the physical damage cost:	+ 6,500	
for total damages and losses:	**$64,514**	

In this example, nearly 90% of the total damages and losses arise from the economic impact of the road closure. Only 10% of the total damages and losses are from the repair costs. For benefit-cost analysis of mitigation projects for roads and bridges, it is always extremely important to count the benefits of avoiding road closures. To not do so would be to grossly undercount the benefits of mitigation projects for roads and bridges.

Using Benefit-Cost Review in Mitigation Planning

State and Local Mitigation Planning
How-To Guide Number Five
FEMA 386-5 *May 2007*

FEMA

U.S. Department of Homeland Security
500 C Street, SW
Washington, DC 20472

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INTRODUCTION

The **Disaster Mitigation Act of 2000** (DMA 2000) provides an opportunity for States, Tribal governments, and local jurisdictions to significantly reduce their vulnerability to natural hazards. It also allows them to streamline the receipt and use of Federal disaster assistance through pre-disaster hazard mitigation planning. DMA 2000 places new emphasis on State, Tribal, and local mitigation planning by requiring these entities to develop and submit mitigation plans as a condition of receiving various types of pre- and post-disaster assistance (such as the Pre-Disaster Mitigation [PDM] program and the Hazard Mitigation Grant Program [HMGP]) under the Stafford Act.

On February 26, 2002, the Department of Homeland Security's Federal Emergency Management Agency (FEMA) published an **Interim Final Rule** (the Rule) to implement the mitigation planning requirements of DMA 2000. The Rule outlines the requirements for State, Tribal and local mitigation plans.

FEMA has developed a series of guides, called the **Mitigation Planning "How-To" Guides**, to provide State, Tribal, and local governments with easy-to-understand information needed to initiate and maintain a hazard mitigation planning process and meet the requirements of the Rule. The guides can be ordered free of cost by calling 1-800-480-2520, or they can be downloaded from http://www.fema.gov/plan/mitplanning/planning_resources.shtm#1.

The first four How-To Guides are known as the "core four" guides. They provide the basic instructions for preparing a natural hazard mitigation plan. They are:

- *Getting Started: Building Support for Mitigation Planning* (FEMA 386-1)
- *Understanding Your Risks: Identifying Hazards and Estimating Losses* (FEMA 386-2)
- *Developing the Mitigation Plan: Identifying Mitigation Actions and Implementation Strategies* (FEMA 386-3)
- *Bringing the Plan to Life: Implementing the Hazard Mitigation Plan* (FEMA 386-4)

This How-To Guide, Using Benefit-Cost Review in Mitigation Planning (FEMA 386-5), supplements FEMA 386-3 and focuses on guidance for using Benefit-Cost Review when prioritizing mitigation actions in a hazard mitigation plan.

About This Document

Purpose

The purpose of a mitigation plan is to reduce the community's vulnerability to hazards. After assessing its risks, a community may consider many mitigation options. However, due to monetary as well as other limitations, it is often impossible to implement all mitigation actions. Hence, the Planning Team needs to select the most cost-effective actions for implementation first, not only to use resources efficiently, but to make a realistic start toward mitigating risks.

The Rule supports the principle of cost-effectiveness by requiring hazard mitigation plans to have an action plan that includes a prioritization process that demonstrates a special emphasis on maximization of benefits over costs. The requirement states:

> *The mitigation strategy section shall include] an action plan describing how the actions identified in section (c)(3)(ii) will be prioritized, implemented, and administered by the local jurisdiction. Prioritization shall include a special emphasis on the extent to which benefits are maximized according to a cost benefit review of the proposed projects and their associated costs. [§201.6(c)(3)(iii)]*

The purpose of this guide is to help local jurisdictions understand how to apply the concepts of Benefit-Cost Review to the prioritization of mitigation actions, and thereby meet the requirement of the Rule.

Benefit-Cost Review vs. Benefit-Cost Analysis

The Benefit-Cost Review for mitigation planning differs from the benefit-cost analysis (BCA) used for specific projects. BCA is a method for determining the potential positive effects of a mitigation action and comparing them to the cost of the action. To assess and demonstrate the cost-effectiveness of mitigation actions, FEMA has developed a suite of BCA software, including hazard-specific modules. The analysis determines whether a mitigation project is technically cost-effective.

The principle behind the BCA is that the benefit of an action is a reduction in future damages. The Benefit-Cost Review method described in this guide is based on the same principle, but this guide does NOT explain how to conduct a BCA. DMA 2000 does not require hazard mitigation plans to include BCAs for specific projects.

A Benefit-Cost Review can satisfy the DMA 2000 requirements even if it is relatively simple. Remember that a Benefit-Cost Review can be broad and need not be complex. It needs to be comprehensive so that it covers

monetary as well as non-monetary costs and benefits associated with each action. Some projects can be extremely cost-effective but not as beneficial for the community at large. The Planning Team should think through a wide variety of questions, such as: How many people will benefit from the action? How large an area is impacted? How critical are the facilities that benefit from the action (e.g., is it more beneficial to protect the fire station than the administrative building, even though it costs more)? Environmentally, does it make sense to do this project for the overall community?

A hazard mitigation plan must demonstrate that a process was employed that emphasized a review of costs and benefits when prioritizing the mitigation actions. This requirement allows the Planning Team flexibility in determining which method to use. Four methods are described in this document, ranging from qualitative to more quantitative. These examples are intended to be illustrative of acceptable processes, but do not cover all possible methods that are approvable under DMA 2000.

How to Use This How-To Guide

The Rule states, "The mitigation strategy shall include a section that identifies and analyzes a comprehensive range of mitigation actions." However, no specific methodology for the analysis is specified or required. FEMA 386-3 discusses some ways to conduct an analysis. This How-To Guide, Using Benefit-Cost Review in Mitigation Planning (FEMA 386-5), provides methods and examples to review benefits and costs, prioritize actions and document the entire process.

This guide is organized as follows:

Part 1 - Review Benefits and Costs – This section explains how to review benefits and costs for each action.

Part 2 A - Prioritize Actions – Qualitative Methods – This section provides two qualitative methods to prioritize actions (Methods A and B).

Part 2 B - Prioritize Actions – Quantitative Methods – This section provides two quantitative methods to prioritize actions (Methods C and D).

Part 3 - Document the Review and Prioritization Process – This section discusses documentation of the Benefit-Cost Review process in the plan to meet DMA 2000 requirements.

Worksheets (Review Tools) like the ones in Part 1 can be used to summarize the costs and benefits. After the review of benefits and costs for each action, the Planning Team will be able to prioritize the actions.

They can then use one of the four methods (A to D), which range from simple to complex. See Figure 1 for an illustration of how to use this guide. Blank worksheets are included in Appendix A, Exhibits. The worksheets can be duplicated and used to record the progress of prioritizing mitigation actions for the hazard mitigation plan.

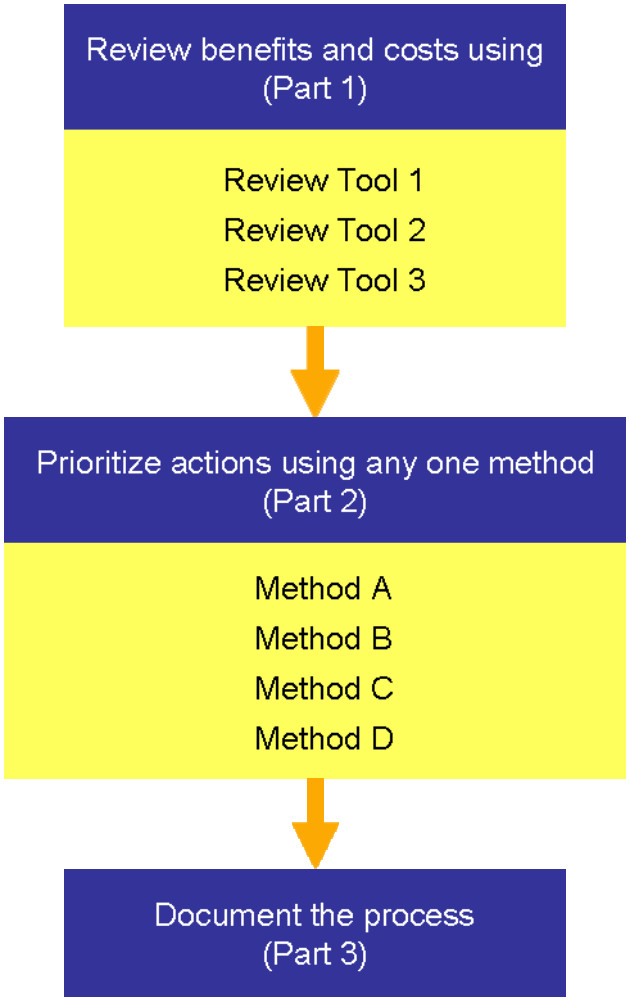

Figure 1. How to Use This How-To Guide

Therefore, a hazard mitigation plan will meet the requirements of the Rule by:

- Using Review Tools 1, 2, and 3 from Part 1,
- Using any one prioritization method from Part 2 (Method A, B, C, or D), and
- Documenting the process (as described in Part 3).

PART 1: REVIEW BENEFITS AND COSTS

To assess the measurable and non-measurable benefits and costs associated with each action, use Review Tools 1, 2, and 3. Then, summarize the analysis of each action's benefits and costs and use this review later when prioritizing the actions.

Review Tool 1: Measuring Vulnerability Before and After Mitigation

Action: _____

Vulnerability	Before the Action is implemented*	After the Action is implemented*	Difference
Number of people affected by the hazard			
Area affected (acreage) by the hazard			
Number of properties affected by the hazard			
Property damage (amount in $)			
Loss of use (number of properties/physical assets [e.g., bridges] in number of days)			
Loss of life (number of people)			
Injury (number of people)			
**			

*Include measurable items, where possible, based on experience, professional estimate, or judgment.
**Add more categories of risk as appropriate for the specific community's plan.

Sample Exhibit 1: Measuring Vulnerability Before and After Mitigation

(Exhibit 1 shows Review Tool 1 filled out for one action)

Action: Floodproof 10 businesses in the downtown area

Vulnerability	Before the Action is implemented	After the Action is implemented	Difference
Number of people affected by the hazard	Almost entire community (because downtown is affected)	Same as before but they will be less affected if businesses are able to remain open	Less impact
Area affected (acreage) by the hazard	1 acre	1 acre	Area still affected but less impact
Number of properties affected by the hazard	15	5	10
Property damage (amount in $)	$100,000 every year	$10,000 every year	$90,000 every year
Loss of use (number of properties/physical assets [e.g., bridges] in number of days)	10 properties for 5 days every year	0	Completely eliminated
Loss of life (number of people)	2 every 20 years	1 every 20 years	Reduced by half
Injury (number of people)	0	0	0

A simple listing of other costs and benefits (that do not fit into the quantitative format of Review Tool 1) can supplement Review Tool 1, as shown in Review Tools 2 and 3. Fill out as many items as possible.

Review Tool 2: Benefits

Action: _____

Benefits
Risk reduction (short- or long-term)
If other community goals are achieved, explain
If easy to implement, explain
If funding is available, explain
If politically/socially acceptable, explain

Sample Exhibit 2: Benefits

Action: Floodproof 10 businesses in the downtown area

Benefits
City's cost to repair flooded properties reduced by 80%; approximate saving of $5,000 per year
Flooding problem in downtown area solved for the long-term; community's problem of business interruption solved
Federal grants like Flood Mitigation Assistance (FMA) and PDM can be applied for to implement the proposed floodproofing
Will help improve CRS rating in the long term (so entire community's flood insurance premium will be reduced)
More than half the members of the City Council are opposed to buy-outs; it might be easier to get their support for an alternative to buy-outs

Review Tool 3: Costs

Action: _____

Costs*
Construction cost (amount in $)
Programming cost (amount in $, # of people needed to administer)
Time needed to implement
If unfair to a certain social group, explain
If there is public/political opposition, explain
If there are any adverse effects on the environment, explain

*If precise costs are not available, use costs based on experience, professional estimate, or judgment.

Sample Exhibit 3: Costs

Action: Floodproof 10 businesses in the downtown area

Costs
Floodproofing cost = $10,000 X 10 = $100,000
Need at least 3 people to administer (after technical assistance from the State)
Need a year to implement

PART 1: REVIEW BENEFITS AND COSTS

After reviewing benefits and costs for all the actions using the Review Tools, go on to prioritize the actions. Note that there are many ways of prioritizing actions; however, DMA 2000 mandates an emphasis on Benefit-Cost Review as part of the prioritization process. Directly linking the prioritization process to the Benefit-Cost Review clearly shows that costs and benefits were emphasized. Therefore, when the review of benefits and costs of actions in Part 1 is used to prioritize the actions using one of the methods from Part 2, the process meets DMA 2000 requirements.

PART 2A: PRIORITIZE ACTIONS - QUALITATIVE METHODS

Based on the review completed in Part 1, use Part 2 to prioritize or rank the actions.

The two qualitative methods described in this section rely on a holistic response or common sense ranking. The two quantitative approaches in Part 2B rely more on comparative analysis that can be translated into mathematical scores. When the number of actions is relatively small, a subjective or qualitative process may be used. The greater the number of actions, the more likely it is that a more quantitative approach will be useful in assigning priority.

Method A: Simple Listing

The qualitative method described below helps the Planning Team judge the priorities of actions based on perceived pros and cons (i.e., benefits and costs).

The method is best used when it is not possible, or appropriate, to identify a quantitative measure of benefits and costs. Each action can have a unique advantage or disadvantage that can subsequently be used for prioritization.

Using this method ensures that special emphasis is given to Benefit-Cost Review by categorizing prioritization criteria (e.g., ease of implementation, technical effectiveness) as either benefits or costs.

Step 1: List identified actions

For each hazard, list the actions identified earlier in the plan.

Step 2: Identify benefits and costs

Identify all expected benefits (i.e., positive effects) and costs (i.e., perceived obstacles) of the actions and write these down in the benefits and costs columns, respectively. Use Review Tools 1, 2, and 3 (see Exhibits 1, 2, and 3) from Part 1.

Step 3: Assign priority

As a result of the Benefit-Cost Review, the Planning Team assigns a priority to each action. Priority can be expressed in many ways, such as:

- High, medium, low, accompanied by an explanation of what each term means.
- Priority 1, Priority 2, etc.
- Immediate, short-term, and long-term, accompanied by an explanation of what each category means (e.g., immediate = within a month, short-term = within 6 months, long-term = within 2 years).

Sample Exhibit 4: Prioritization by Listing Benefits and Costs

Actions	Benefits (Pros)	Costs (Cons)	Priority
Floodproof 10 businesses in the downtown area	- Avoidance of 1 loss of life every 20 years (casualties reduced by half) - Saving of $90,000 in private damages and $5,000 in public cost - Loss of use of 10 downtown businesses completely eliminated - Community's problem of business interruption solved - Federal grants like FMA and PDM can be applied for to implement the proposed floodproofing - Will help improve CRS rating in the long term (so entire community's flood insurance premium will be reduced) - More than half the members of the City Council are opposed to buy-outs; it might be easier to get their support for an alternative to buy-outs	- Floodproofing cost = $10,000 X 10 = $100,000 - Need at least 3 people to administer (after obtaining technical assistance from the State) - Need a year to implement	High (Priority no. 1)
Build safe rooms for a neighborhood of 50 homes without basements	- Avoidance of 5 lives lost every 20 years (casualties reduced by half) - Public and political support for mitigating this hazard exists (due to regular recurrence of tornadoes)	- City will share 50% of the cost per existing home = $2,000 X 50 = $100,000 - Administrative cost per home = $1,000 X 50 = $50,000 - Need 3 years to complete - Tornadoes are unpredictable; they may never strike this exact area again	Medium (Priority no. 2)
Broadcast educational video on local channel on hazard mitigation	- Local channel might be willing to broadcast free of cost - Publicity would spread awareness about mitigation methods as well as what to do in an emergency	- Cost of preparing video = $5,000 - Only 5% of population might notice the broadcast - Only 5% of that 5% might actually consider acting on individual mitigation methods	Low (Priority no. 3)

Method B: Relative Rating

A second approach is to assign relative scores to the actions based on qualitative factors. By rating costs and benefits as High, Medium, and Low, this method clearly emphasizes the Benefit-Cost Review. Exhibit 5 uses a set of factors commonly called STAPLEE, which stands for **S**ocial, **T**echnical, **A**dministrative, **P**olitical, **L**egal, **E**conomic, and **E**nvironmental factors. They are typically used for evaluating planning alternatives. For details on using STAPLEE, refer to FEMA 386-3.

Sample Exhibit 5: Prioritization Using STAPLEE and Qualitative Scores

Actions → / Criteria ↓	Floodproof 10 properties in the downtown area		Build safe rooms in a neighborhood of 50 homes without basements		Broadcast educational video about hazard mitigation on local channel	
	Cost	**Benefit**	**Cost**	**Benefit**	**Cost**	**Benefit**
Social	-	-	L	-	-	-
Technical	M	H	M	M	L	L
Administrative	M	-	M	-	L	-
Political	-	L	-	H	-	-
Legal	-	-	-	-	-	-
Economic	M	H	H	-	-	-
Environmental	-	-	-	-	-	-
Priority	High (priority 1)		Medium (priority 2)		Low (priority 3)	

Definition of rating scale: H=High, M=Medium, L=Low, - None/Not applicable

Use the Review Tools completed in Part 1 to help rate the costs and benefits. For help on how to rank High, Medium, Low, None, or NA, see the explanation about STAPLEE in FEMA 386-3.

PART 2B: PRIORITIZE ACTIONS - QUANTITATIVE METHODS

Quantitative methods typically assign numerical values to concepts like high, medium, and low. The Planning Team needs to review the scores and make sure they make sense.

Method C: Simple Score

A simple way of using scores based on the STAPLEE criteria is shown in Exhibit 6. After the table is completed, the scores can be added to determine priority.

Sample Exhibit 6: Prioritization Using STAPLEE and Simple Scores

Actions → / Criteria ↓	Floodproof 10 properties in the downtown area		Build safe rooms in a neighborhood of 50 homes without basements		Broadcast educational video about hazard mitigation on local channel	
	Cost	**Benefit**	**Cost**	**Benefit**	**Cost**	**Benefit**
Social	0	1	-1	1	0	0
Technical	-1	2	-1	2	-1	1
Administrative	-1	0	-1	0	-1	0
Political	0	1	0	1	0	0
Legal	0	0	0	0	0	0
Economic	-1	2	-1	0	0	0
Environmental	0	0	0	0	0	0
Sub-total of cost/benefit	-3	6	-4	4	-2	1
Total Score	-3+6 = 3		-4+4 = 0		-2+1 = -1	
Priority	**No. 1**		**No. 2**		**No. 3**	

Definition of rating scale: 2=Very beneficial, 1=Favorable, 0=None/Not applicable, -1=Not Favorable

The Planning Team should be careful when assigning criteria, scores, and weights to avoid the problem inherent in comparing different types of actions. In the example above, the scores allowed the participants to objectively compare the various actions. The weakness of such a simple method is that very different kinds of actions may score similarly, and if not given qualitative consideration (a common-sense check), may yield a questionable ranking. In this example, the safe-room action's total score is very low compared to the floodproofing action, but the Relative Rating method (Method B in Part 2A) showed that for floodproofing and safe rooms, the actions were similar in how their benefits measured up against the costs, and for both actions the benefits exceeded the costs. The Simple Score method shown above, however, results in a greater difference in the final priority scores (3 vs. 0), indicating a large difference

in these actions' cost-effectiveness. A formal Benefit-Cost Analysis for each project would verify whether this large difference is accurate, although it is not required for the plan.

Method D: Weighted Score

As noted in the Simple Score method (Method C), a common-sense adjustment may be necessary to adapt the prioritization to the plan. The weighted score method attempts to compensate for the limitations of the Simple Score method by adding emphasis to those factors judged to be more important.

An example of weighted scores using STAPLEE follows.

Sample Exhibit 7: Prioritization Using STAPLEE and Weighted Scores

Actions → / Criteria ↓	Floodproof 10 properties in the downtown		Build safe rooms in a neighborhood of 50 homes without basements		Broadcast educational video about hazard mitigation on local channel	
	Cost	**Benefit**	**Cost**	**Benefit**	**Cost**	**Benefit**
Social (weight = 1)	0	1	-1	1	0	0
Technical (weight = 2)	-1x2=-2	2x2=4	-1x2=-2	2x2=4	-1x2=-2	1x2=2
Administrative (weight = 1)	-1	0	-1	0	-1	0
Political (weight = 1)	0	1	0	1	0	0
Legal (weight = 1)	0	0	0	0	0	0
Economic (weight = 2)	-1x2=-2	2x2=4	-1x2=-2	0	0	0
Environmental (weight = 1)	0	0	0	0	0	0
Sub-total of cost/benefit	-5	10	-6	6	-3	2
Total Score	-5+10 = 5		-6+6 = 0		-3+2 = -1	
Priority	**No. 1**		**No. 2**		**No. 3**	

Definition of rating scale: 2=Very beneficial, 1=Favorable, 0=None/Not applicable, -1=Not Favorable

Assigning weights to some factors over others can become challenging for the Planning Team. Local knowledge and values should guide the process to achieve the priorities most appropriate for the local situation.

PART 3: DOCUMENT THE REVIEW AND PRIORITIZATION PROCESS

Remember to document in the plan the Benefit-Cost Review process and prioritization method used. Include the Review Tools and prioritization worksheets from this How-To Guide in the plan. Clearly explain how the scores and priorities were assigned.

Be sure to explicitly state that Benefit-Cost Review was **emphasized** in the prioritization process. Using the Review Tools and one of the methods for prioritization from this guide ensures the emphasis on the maximization of benefits over costs. This approach demonstrates that the actions are being evaluated in terms of their pros and cons, which are represented as costs and benefits.

The intention of DMA 2000 is for the hazard mitigation plan to be useful and unique for each community; therefore, an impartial review and ranking of the mitigation actions is key. It is not so important which method is used, but rather that the method chosen is logical and clearly documented.

Remember that the Benefit-Cost Review is an important element of the community's hazard mitigation plan. Keep it simple, and focus on your community's needs and values.

Appendix A

Exhibits

Exhibit 1: Measuring Vulnerability Before and After Mitigation

Action: _____

Vulnerability	Before the Action is implemented*	After the Action is implemented*	Difference
Number of people affected by the hazard			
Area affected (acreage) by the hazard			
Number of properties affected by the hazard			
Property damage (amount in $)			
Loss of use (number of properties/physical assets [e.g., bridges] in number of days)			
Loss of life (number of people)			
Injury (number of people)			
**			

*Include measurable items, where possible, based on experience, professional estimate, or judgment.

**Add more categories of risk as appropriate for the specific community's plan.

Exhibit 2: Benefits

Action: _____

Benefits
Risk reduction (short- or long-term)
If other community goals are achieved, explain
If easy to implement, explain
If funding is available, explain
If politically/socially acceptable, explain

Exhibit 3: Costs

Action: _____

Costs*
Construction cost (amount in $)
Programming cost (amount in $, # of people needed to administer)
Time needed to implement
If unfair to a certain social group, explain
If there is public/political opposition, explain
If there are any adverse effects on the environment, explain

*If precise costs are not available, use costs based on experience, professional estimate, or judgment.

Exhibit 4: Prioritization by Listing Benefits and Costs

Actions	Benefits (Pros)	Costs (Cons)	Priority

Exhibit 5: Prioritization Using STAPLEE and Qualitative Scores

Actions → / Criteria ↓						
	Cost	**Benefit**	**Cost**	**Benefit**	**Cost**	**Benefit**
Social						
Technical						
Administrative						
Political						
Legal						
Economic						
Environmental						
Priority						

Definition of rating scale: _____

Exhibit 6: Prioritization Using STAPLEE and Simple Scores

Actions → / Criteria ↓						
	Cost	**Benefit**	**Cost**	**Benefit**	**Cost**	**Benefit**
Social						
Technical						
Administrative						
Political						
Legal						
Economic						
Environmental						
Sub-total of cost/benefit						
Total Score						
Priority						

Definition of rating scale: _____

Exhibit 7: Prioritization Using STAPLEE and Weighted Scores

Actions → / Criteria ↓						
	Cost	**Benefit**	**Cost**	**Benefit**	**Cost**	**Benefit**
Social (weight = __)						
Technical (weight = __)						
Administrative (weight = __)						
Political (weight = __)						
Legal (weight = __)						
Economic (weight = __)						
Environmental (weight = __)						
Sub-total of cost/benefit						
Total Score						
Priority						

Definition of rating scale: _____