

King County Dam Safety Emergency Planning Gap Analysis Report

FINAL

Prepared for

King County Office of Emergency Management

And

King County Flood Control District

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TABLE OF CONTENTS

1.	Introduction.....	1
1.1.	Background and Purpose	1
1.2.	Background on Emergency Response Plans.....	1
1.2.1.	Emergency Action Plans.....	2
1.2.2.	Evacuation Planning	2
1.2.3.	Shelter Planning.....	3
2.	Emergency Action Plan Reviews	5
2.1.	Summary of EAP Acquisition and Availability.....	5
2.2.	EAP Review Process.....	11
2.3.	Results of EAP Review and Gaps Identified	12
2.3.1.	Overall EAP Review Results	12
2.3.2.	Detailed EAP Review Components	13
2.4.	Estimates for Costs to Update Gaps.....	23
3.	Evacuation Plan Reviews	25
3.1.	Document Review.....	25
3.2.	Methodology	26
3.3.	Key Findings	27
3.4.	Dam Failure Warning Process	28
4.	Mass Care & Sheltering Plan Reviews.....	30
4.1.	Document Review.....	30
4.2.	Methodology	32
4.3.	Key Findings.....	32
4.4.	Defining the Scope of Mass Care and Shelter (ESF-6)	32
5.	Public Education	34
5.1.	Document Review.....	34
5.2.	Methodology	34
5.3.	Key Findings	35
5.4.	Dam Safety and Public Education	35
6.	Summary and Recommendations.....	40
6.1.	Gap Analysis Review Summary	40
6.1.1.	Summary of EAP Reviews	40
6.1.2.	Summary of Evacuation Plan Reviews.....	43
6.1.3.	Summary of Mass Care & Shelter Plan Reviews	44

6.2.	Recommendations.....	44
6.2.1.	EAP Recommendations	44
6.2.2.	Evacuation Plan Recommendations.....	50
6.2.3.	Mass Care and Sheltering Plan Recommendations	53
6.2.4.	Public Education Recommendations	57
7.	References	59

LIST OF TABLES

Table 1.	Downstream Hazard Classes for Dams (DOE 2017).....	5
Table 2.	Dams Impacting King County that Require EAPs (DOE 2017)	6
Table 3.	Summary of EAPs Obtained and Not Obtained for Review	8
Table 4.	Number of Reviewed EAPs by Dam Owner Type	8
Table 5.	Number of not obtained EAPs (including Drafts) by Dam Owner Type	8
Table 6.	Dams with Possible EAPs but not obtained.....	9
Table 7.	Dam Sizes for Cost Estimating.....	24
Table 8.	Dam Sizes for Cost Estimating.....	24
Table 9.	Hazus Model Summary of Potential Impacts of Major Dam Failure Scenarios	27
Table 10.	Summary of Dam Safety Public Education Resources.....	38
Table 11.	Hazard Class 1A & 1B Dams w/ No EAP Update in more than 5 years.....	41
Table 12.	Tabletop/Functional Exercises in Reviewed EAPs	42
Table 13.	Dam Sizes for Cost Estimating.....	44
Table 14.	Cost Estimate for Revising and Updating Text in EAPs Not Revised within the Last Year	45
Table 15.	Dams without Inundation Mapping in Reviewed EAPs.....	46
Table 16.	Cost Estimate to Create Inundation Mapping for Dams in Table 13.....	46
Table 17.	Hazard Class 1A Dams w/ Inundation Mapping Updated >5 years ago	47
Table 18.	Cost Estimate for Reviewing Inundation Mapping for Dams in Table 17	47
Table 19.	Cost Estimate for Conducting Tabletop Exercises	48
Table 20.	Cost Estimate for KCOEM to Assist Dam Owners with Tabletop Exercises for Dams in Table 19	48
Table 21.	Cost Estimate for Incorporating EAP inundation maps into CodeRed system	50
Table 22.	Cost Estimate for developing alternate method and tools for conducting public warning	51
Table 23.	Cost Estimate for incorporating AFN requirements/best practices	51

Table 24. Cost Estimate for conducting Evacuation Capabilities Assessment and assessing MOUs.....	52
Table 25. Cost Estimate for revising the Mass Evacuation Incident Annex	53
Table 26. Cost Estimate for determining care & shelter requirements.....	54
Table 27. Cost Estimate for conducting Shelter Needs Assessment and assessing MOUs.....	54
Table 28. Cost Estimate for addressing AFN requirements and best practices	55
Table 29. Cost Estimate for revising the ESF-6 Annex.....	56
Table 30. Cost Estimate for developing initial dam failure public education program	58

LIST OF FIGURES

Figure 1. Emergency Plan Relationships	2
Figure 2. Dams with EAPs Reviewed.....	10
Figure 3. Summary of Completeness of Information Relative to EDSO Guidelines for All EAP Reviewed Items.....	12
Figure 4. Completeness of Roles and Responsibility Information for Dam EAPs Reviewed.....	14
Figure 5. Completeness of Event Detection Information for Dam EAPs Reviewed.....	15
Figure 6. Completeness of Emergency Level Determination Information for Dam EAPs Reviewed.....	16
Figure 7. Completeness of Notification and Communications Information for Dam EAPs Reviewed.....	17
Figure 8. Completeness of Expected Actions Information for EAPs Reviewed	18
Figure 9. Completeness of Event Termination Information Dam EAPs Reviewed	19
Figure 10. Completeness of Training Information Dam EAPs Reviewed.....	20
Figure 11. Documentation of Tabletop/Functional Exercises Conducted for Dam EAPs Reviewed.....	21
Figure 12. Completeness of Inundation Maps in the Dam EAPs Reviewed	22
Figure 13. Number of Years since Dam EAPs Last Updated.....	23
Figure 14. King County Evacuation Planning Documents Relationships	26
Figure 15. King County Mass Care & Shelter Planning Documents Relationships.....	31
Figure 16. NAS Conceptual Framework for Resiliency-Focuses Collaboration Related to Dam and Levee Safety	37

LIST OF APPENDICES

Appendix A: Additional EAP Review Data
Appendix B: Evacuation Plans Assessment Tool
Appendix C: Mass Care and Shelter Plans Assessment Tool

LIST OF ACRONYMS

Abbreviation	Definition
ADA	Americans with Disabilities Act
AFN	Access and Functional Needs
ARC	American Red Cross
ASDSO	Association of State Dam Safety Officials
ASPCA	American Society for the Prevention of Cruelty to Animals
CEMP	Comprehensive Emergency Management Plan
CMS	Consumable Medical Supplies
CPOD	Community Points of Distribution
DME	Durable Medical Equipment/Devices
DNRP	Department of Natural Resources and Parks
DOE	Department of Ecology
DOJ	Department of Justice
EAP	Emergency Action Plan
EAS	Emergency Alert System
ECC	Emergency Coordination Center
EDSO	Ecology Dam Safety Office
EEI	Essential Elements of Information
EMAC	Emergency Management Assistance Compact
ESF	Emergency Support Function
ESF 6	Emergency Support Function #6: Mass Care and Shelter
FEMA	Federal Emergency Management Agency
FERC	Federal Energy Regulatory Commission
FNSS	Functional Needs Support Services
FOG	Field Operations Guide
ICP	Incident Command Post
JIT	Just-in-Time
KCFCD	King County Flood Control District
KCOEM	Office of Emergency Management (King County)
KCRCECC	Regional Communication and Emergency Coordination Center (King County)
KCWLRD	King County Water and Land Resources Division

Abbreviation	Definition
MOU	Memoranda of Understanding
n.d.	No Date
NAS	National Academy of Science
NECLC	National Emergency Child Locator Center
NEFRLS	National Emergency Family Registry and Locator System
NEMA	National Emergency Management Association
NFIP	National Flood Insurance Program
NMETS	National Mass Evacuation Tracking System
NSS	National Shelter System
PAS	Personal Assistance Services
PMP	Probable Maximum Precipitation
PSAP	Public Safety Answering Point
RCECC	Regional Communication and Emergency Coordination Center
RHMP	Regional Hazard Mitigation Plan (King County)
RSOA	Regional Shelter Operations Incident Annex (King County)
TEP	Training and Exercise Program
THIRPA	Threat Hazard Identification and Risk Assessment
SOG	Standard Operating Guide
WAC	Washington Administrative Code

GLOSSARY OF FREQUENTLY USED TERMINOLOGY

Dam Safety Terms

Acre-foot

A unit of (volumetric) measure that would cover one acre with water (or other fluid) to a depth of one foot. One acre-foot is equal to 43,560 cubic feet or 325,850 gallons.

Boil

An upward disturbance in the surface layer of soil caused by water escaping under pressure from beneath the surface.

Breach, Sunny Day

An opening through a dam that allows the uncontrolled draining of a reservoir when the water surface elevation of the reservoir behind the dam is at normal pool elevation and does not typically occur during a flood event. A controlled breach is a constructed opening. An

uncontrolled breach is an unintentional opening caused by discharge from the reservoir. A breach is generally associated with the partial or total failure of the dam.

Breach, Maximum Storage Elevation

An opening through a dam that allows the uncontrolled draining of a reservoir when the water surface elevation of the reservoir behind the dam is at the maximum possible storage level. This type of breach is typically associated with an extreme flood event. A controlled breach is a constructed opening. An uncontrolled breach is an unintentional opening caused by discharge from the reservoir. A breach is generally associated with the partial or total failure of the dam.

Dam

A man-made barrier, together with appurtenant structures, constructed above the natural surface of the ground for the purpose of impounding water. Any artificial barrier and/or any controlling works, together with appurtenant works, that can or does impound or divert water. (Washington Administrative Code, Title 173, Chapter 175.)

Dam failure

An uncontrolled release of impounded water due to structural deficiencies in a dam.

Dam Owner

Any person, private or non-profit company, special district, federal, state, or local government agency, or any other entity in direct routine control of a dam and reservoir, and/or directly involved in the physical operation and maintenance of a dam.

Drainage area

The land area that drains to a particular point on a river or stream. (Watershed area)

Emergency, Dam

A condition that develops unexpectedly, endangers the structural integrity of the dam and/or downstream human life and property, and requires immediate action.

Emergency Action Plan (EAP)

A document that identifies potential emergency conditions at a dam and specifies actions to be followed to minimize property damage and loss of life. The plan specifies actions the dam owner should take to alleviate problems at a dam. It contains procedures and information to assist the dam owner in issuing early warning and notification messages to responsible downstream emergency management authorities of the emergency situation. It also contains inundation maps to show emergency management authorities the critical priority areas for action in case of an emergency.

Hazard Classification

The placement of a dam into one of three categories (High, Significant & Low) based on the hazard potential derived from an evaluation of the probable adverse consequences due to failure or improper operation of the dam.

High Hazard Dam

Dams where a failure of the structure and the release of the reservoir would result in 7 or more lives at risk in the downstream valley (DOE 2017).

Instrumentation

An arrangement of devices installed into or near dams that provide measurements to evaluate the structural behavior and other performance parameters of the dam and appurtenant structures.

Inundation Map

A map depicting the area downstream from a dam that would reasonably be expected to be flooded in the event of a failure of the dam. Inundation maps reflect many complex inherent assumptions so the mapped areas are not expected to exactly match any actual event, but are intended to provide a reasonable basis for planning of related downstream activities.

Inundation Zone

The area downstream from a dam that would reasonably be expected to be flooded in the event of a failure of the dam.

Local Emergency Manager

Person(s) responsible for developing, organizing, and exercising a community's emergency operations plan. Typically, City Police or Fire Department, or County Sheriff's Department personnel act as the Local Emergency Manager.

Notification

Immediately inform appropriate individuals, organizations, or agencies about a potential emergency event so they can initiate appropriate actions.

Outlet

A conduit (usually regulated by gates or valves) used for controlled or regulated releases of impounded water from the reservoir.

Reservoir

A body of water impounded by a dam.

Routing

Numerical modeling used to determine the downstream progression of a flood wave including determination of discharges, flood depths, and inundation extents.

Seepage

The continuous movement of water through the soil or concrete of a dam.

Significant Hazard Dam

Dams where a failure of the structure and the release of the reservoir would result in 1 to 6 lives at risk or create significant economic/environmental risk in the downstream valley (DOE 2017).

Spillway, Principal

The overflow structure designed to limit or control the operating level of a reservoir, and first to be activated in runoff conditions.

Spillway, Emergency

The appurtenant structure designed to pass large flood events in conjunction with the routing capacity of the reservoir and any principal or service spillway(s). For newer dams, the structure is designed to pass the Inflow Design Flood (IDF).

State Dam Safety Engineer

Washington State Department of Ecology, Dam Safety Office engineer(s) responsible for safety inspections, plan review and determining the safe reservoir storage level of assigned dams.

Emergency Management Terms**Access and Functional Needs**

Those actions, services, accommodations, and programmatic, architectural, and communication modifications that a covered entity must undertake or provide to afford individuals with disabilities a full and equal opportunity to use and enjoy programs, services, activities, goods, facilities, privileges, advantages, and accommodations in the most integrated setting. These actions are in light of the exigent circumstances of the emergency and the legal obligation to undertake advance planning and prepare to meet the disability-related needs of individuals who have disabilities as defined by the Americans with Disabilities Act Amendments Act of 2008, P.L. 110-325, and those associated with them.

Commodity (Community) Point of Distribution (C-POD)

A designated area where commodities are distributed to the public following a disaster or emergency on a first-come, first-served basis. This could include emergency meals, water, baby formula, ice, and tarps.

Congregate Care

The provision of essential mass care and emergency assistance to evacuees in a collective setting due to the impact of a disaster or emergency.

Congregate Care Activities

Life-sustaining activities include, but are not limited to, sheltering, feeding, distribution of emergency/essential and/or life-sustaining items, reunification services, emotional support and counseling services, information and referral, first aid in congregate care facilities, and additional activities identified in the NRF as “Emergency Assistance Services.”

Congregate Shelter

Generally provided in large open settings that provide little to no privacy in facilities that normally serve other purposes such as schools, churches, community centers, and armories.

Consumable Medical Supplies (CMS)

Medical supplies (medications, diapers, bandages, etc.) that are ingested, injected, or applied and/or are one time use only.

Durable Medical Equipment (DME)

Medical equipment (e.g., walkers, canes, wheelchairs, etc.) used by persons with a disability to maintain their usual level of independence.

Emergency Management Assistance Compact (EMAC)

Administered by the National Emergency Management Association (NEMA), EMAC is a congressionally ratified organization that provides form and structure to interstate mutual aid.

Emergency Support Function (ESF) #6

Mass Care, Emergency Assistance, Temporary Housing, and Human Services.

Emotional Assistance/Support Animal

Dogs [or other animal] whose sole function is to provide comfort or emotional support [and] do not qualify as service animals under the ADA (United States Department of Justice [DOJ], 2010).

Essential Services

The delivery of infrastructure and additional essential services to address disaster-related needs of affected residents living in temporary housing sites.

Evacuation

The organized, phased, and supervised withdrawal, dispersal, or removal of civilians from dangerous or potentially dangerous areas, and their reception and care in safe areas. Three general types of evacuations are defined below.

A spontaneous evacuation occurs when residents or citizens in the threatened areas observe an incident or receive unofficial word of an actual or perceived threat and, without receiving instructions to do so, elect to evacuate the area. Their movement, means, and direction of travel are unorganized and unsupervised.

A voluntary evacuation is a warning to persons within a designated area that a threat to life and property exists or is likely to exist in the immediate future. Individuals issued this type of warning or order are *not required* to evacuate; however, it would be to their advantage to do so.

A mandatory or directed evacuation is a warning to persons within the designated area that an imminent threat to life and property exists and individuals *must* evacuate in accordance with the instructions of local officials.

Functional Needs Support Services (FNSS)

Services that enable individuals to maintain their independence in a general population shelter. FNSS includes:

- reasonable modification to policies, practices, and procedures
- durable medical equipment (DME)
- consumable medical supplies (CMS)
- personal assistance services (PAS)
- other goods and services as needed

Hazus

A nationally applicable standardized methodology distributed by FEMA that contains models for estimating potential losses from earthquakes, floods, and hurricanes. Hazus uses Geographic Information Systems (GIS) technology to estimate physical, economic, and social impacts of disasters.

Household Pet

Domesticated animals that: are traditionally kept in the home for pleasure rather than for commercial purposes; can travel in commercial carriers; or can be housed in temporary facilities. Examples are dogs, cats, birds, rabbits, rodents, and turtles. Household pets do not include reptiles (except turtles), amphibians, fish, insects, arachnids, farm animals (including horses), or animals kept for racing purposes (FEMA, 2017).

Mass Care Activities

Mass Care activities include Sheltering, Feeding, Distribution of Emergency Supplies and Reunification as defined under the Mass Care Function of Emergency Support Function (ESF) # 6 of the National Response Framework.

National Emergency Child Locator Center (NECLC)

A center that shares information with FEMA, American Red Cross, U.S. Department of Health and Human Services, and local governments as needed to facilitate the reunification of children with their families.

The National Emergency Family Registry and Locator System (NEFRLS)

A FEMA web-based system that facilitates the reunification of families separated as a result of a major disaster.

National Shelter System (NSS)

A comprehensive Web-based data system developed by the American Red Cross and FEMA to support sheltering agencies/organizations responsible for disaster shelter management to identify, track, analyze, and report shelter data.

National Mass Evacuation Tracking System (NMETS)

Manual and computer-based systems designed to assist States in tracking the movement of transportation-assisted evacuees, their pets/service animals, luggage, and medical equipment during evacuations.

Non-Congregate Shelters

Sheltering that provides alternatives for incidents when conventional congregate sheltering methods are unavailable or overwhelmed, or longer term temporary sheltering is required. Typically, facilities that are used provide a higher level of privacy than conventional congregate shelters, hotels, and cruise ships, other facilities with private sleeping spaces but possibly shared bathroom /cooking facilities, dormitories, and/or converted buildings, or staying with friends/family.

People with Disabilities and Other Access and Functional Needs Support

Access and functional needs support services are services that enable people to maintain independence in a general population shelter. These services include reasonable modifications to policies, practices and procedures, durable medical equipment (DME), consumable medical supplies (CMS), personal assistance services (PAS), and other goods and services as needed. Children and adults requiring these services may have physical, sensory, mental health, cognitive and/or intellectual disabilities affecting their ability to function independently without assistance. Others who may benefit from these services include women in late stages of pregnancy, elders, and those needing bariatric equipment.

Persons with Disabilities.

The Americans with Disabilities Act (ADA) of 1990 defines an individual with a disability as a person who: has a physical or mental impairment that substantially limits one or more major life activities; has a record of such an impairment; or is regarded as having such an impairment.

Personal Assistance Services (PAS)

Activities of daily life that allows individuals to maintain their independence while staying in a general population shelter.

Reunification Services

Services that provide mechanisms to help displaced disaster survivors, including children, reestablish contact with family and friends. For example, the American Red Cross “Safe and Well” web site allows people affected by a disaster to list themselves as “safe and well.” Family members can also view the messages left by their loved ones who have self-registered on this site.

Residual Risk

The risk that remains after all efforts to identify and eliminate risk have been made.

Service Animals

Dogs that are individually trained to do work or perform tasks for people with disabilities or access and functional needs. Assistance animals are animals that work, provide assistance, or

perform tasks for the benefit of a person with a disability, or provide emotional support that alleviates identified symptoms or effects of a person's disability. Although dogs are the most common type of assistance animal, other animals can also be assistance animals (FEMA, 2017).

1. INTRODUCTION

1.1. Background and Purpose

After the recent dam stability concerns and subsequent evacuation challenges at the Oroville Dam in California during February 2017, the King County Council (specifically Council members Reagan Dunn and Dave Upthegrove) called for a collaborative review of the existing emergency action plans (EAP) associated with the major dams in King County and a prioritized list of actions necessary to update or create plans for evacuation and shelter for those affected by dam failures. Funding for the collaborative review was allocated by the King County Flood Control District (KCFCD). The King County Office of Emergency Management (KCOEM) in conjunction with the KCFCD engaged Tetra Tech to conduct the plan reviews and develop this gap analysis report. This report provides an independent assessment on the current state of readiness of dam owners to react to structural failures through a review of all available dam EAPs and an evaluation of the current evacuation and sheltering plans within the watersheds affected by any potential structural dam failures. A recommended list of actions based on these assessments is included, along with estimates for the costs and resources to create or update the applicable dam safety planning, evacuation planning, and shelter planning efforts to acceptable “best practices” standards.

1.2. Background on Emergency Response Plans

Although both the King County Regional Hazard Mitigation Plan (RHMP) and the Association of State Dam Safety Officials¹ rate the threat of dam failure as a low risk relative to other hazards (ex. earthquake), such an event could threaten the lives and property of thousands of residents. The critical step in mitigating the threat of dam failure is the timely identification of a hazard, the execution of an effective public warning effort for individuals in the potential inundation zone, the expedient and safe evacuation of the community, and the availability and capacity of short and long term shelter.

Dam owners and local public safety agencies have developed emergency response plans that guide each of these activities:

- Emergency Action Plans (EAPs). Developed by dam owners, these plans guide the initial response to an actual or potential issue and trigger the warning for individuals who may be at risk. Each EAP is specific to a single owner and their water containment facilities.
- Evacuation Plans. Local governments maintain Emergency Operations Plans that coordinate response to major emergencies or disasters – many contain specific guidance on how to conduct public warning efforts as well as coordinate and support large-scale community evacuations. Most are general plans that do not focus on specific dams or dam-related hazard areas.
- Mass Care and Shelter Plans. If residents are forced from their homes, local governments work to provide basic services and resources to support the evacuees including shelter,

¹ ASDSO – Living with Dams: Know Your Risks: <http://www.livingneardams.org/brochure/>

food and water, distribution of critical commodities, pet and livestock sheltering, and post-disaster interim housing.

A detailed discussion of each of these plan types is provided below. Although each plan addresses actions unique to that function, their scopes and responsibilities overlap. The seamless integration and coordination of these plans determines the effectiveness of public safety and security efforts. Figure 1 below illustrates the relationships of these plans.

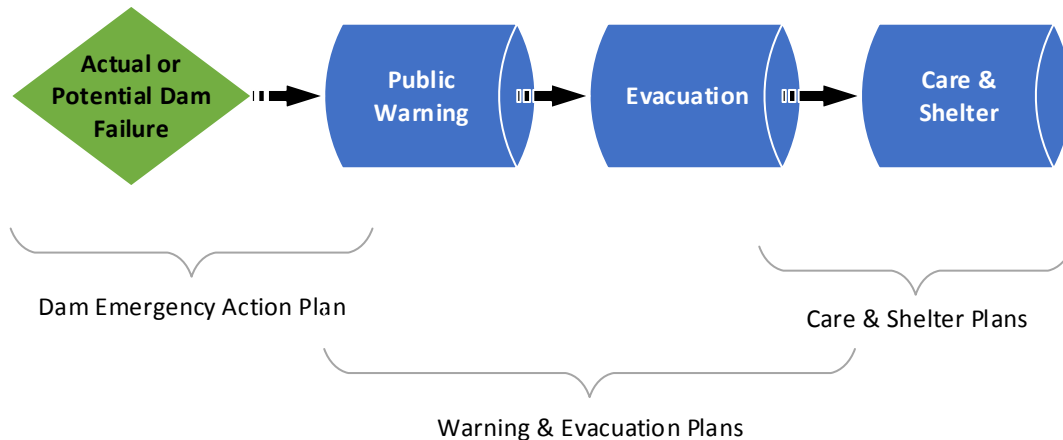


Figure 1. Emergency Plan Relationships

1.2.1. Emergency Action Plans

In the event of a dam-related problem, a critical component for dam safety planning is the detailed information contained within the Emergency Action Plans (EAPs) associated with the individual dams. According to Washington Administrative Code (WAC) 173-175-520, *“In those cases where a failure of a dam could pose a threat to life (...)”* dam owners are required to develop and maintain an EAP that is acceptable to the Department of Ecology and also provide completed EAPs to the State of Washington Dam Safety Office, local emergency officials (this includes KCOEM), and the Washington State Emergency Management Division. WAC 173-175-520 also details what should be included in an EAP, *“The EAP shall describe procedures for responding to unusual or emergency situations and procedures for detecting, evaluating, communicating, and initiating notification or warning of individuals who may be at risk in downstream and upstream areas.”*

According to WAC 173-175-520, the information included in the EAPs must clearly define the methods and procedures used to determine conditions that could lead to a failure of the dam. EAPs should also include actions that are expected to be taken by dam personnel during an event to prevent a dam failure, and detail what circumstances must occur in order for the EAP to be implemented and who should then be notified to begin the implementation of downstream evacuation and sheltering plans.

1.2.2. Evacuation Planning

King County maintains a Comprehensive Emergency Management Plan (CEMP) which provides the broad concepts, policy and authorities necessary to guide the response to a major emergency

or disaster. Additional detailed procedures and tools are provided by annexes to the CEMP. Cities in the County also maintain CEMPs and some have supporting annexes.

The County's Mass Evacuation Incident Annex outlines specific key policies, authorities, terms, planning assumptions, and the concept of operations for conducting large-scale evacuations. Evacuation responsibilities are detailed for all evacuation stakeholder agencies such as County departments, 911 dispatch agencies, fire service agencies, municipalities, transportation departments, the US Coast Guard, Washington State Emergency Management and Patrol, as well as special purpose districts, school districts, and community based organizations. The King County Sheriff serves as the primary agency for evacuation incidents in unincorporated King County.

Detailed evacuation plans have been developed for flooding events on the upper and middle Green River. However, the Howard Hanson Dam is the only dam for which King County has developed specific evacuation plans.

Public notification and warning procedures for potentially affected populations are summarized in the Evacuation Annex and detailed in internal King County Office of Emergency Management Standard Operation Guides (SOGs). The areas to be warned or evacuated are determined based on the inundation maps provided in the EAPs. The inundation maps are not currently pre-loaded in the County's CodeRed automated warning system - current County procedures require these maps to be interpreted and manually entered into the warning system when the EAP has been activated.

In addition to the County's procedures referenced above, municipal CEMPs address warning and evacuation functions for their jurisdictions. However, actual warning and evacuation capabilities vary among municipalities. Most small cities could be expected to request assistance from the County to conduct warning and evacuation operations within their jurisdictions. Additionally, for incidents that could affect more than one jurisdiction, the County will have to broker the allocation of resources, lead operational coordination, facilitate information sharing, and serve as the conduit to the State. As a special case, due to their ownership of the Lake Forest Park Reservoir, the City of Seattle would support the City of Lake Forest Park.

1.2.3. Shelter Planning

Similar in scope and format to the Evacuation Annex, the County's Emergency Support Function 6 (ESF-6) Mass Care and Shelter planning document outlines specific key policies, authorities, terms, planning assumptions, and the concept of operations for coordinating large-scale mass care and shelter efforts. Mass care services are defined as:

1. Sheltering
2. Pet and Livestock Sheltering
3. Post-Disaster Interim Housing
4. Community Points of Distribution (CPODs)
5. Coordination and support of medical services for Alternate Care Facilities

This document provides four key concepts including establishing mass care services task forces, addressing the unique requirements of access and functional needs populations, detailing the relationship with the American Red Cross (ARC), and coordination via the ESF-6 Coordinator when the Regional Communication and Coordination Center (RCECC) is activated. The

KCOEM is the designated primary agency for coordination of mass care services and resources to serve unincorporated King County.

Municipal CEMPs address care and shelters functions for their jurisdictions. Smaller jurisdictions may request assistance from the County to provide resources and coordinate operations.

In partnership with local jurisdictions, the County maintains a Regional Shelter Operations Annex (RSOA) which provides detailed procedures, tools, and forms specific to development and operation of congregate and animal shelters that will serve more than one jurisdiction.

2. EMERGENCY ACTION PLAN REVIEWS

Washington Administrative Code (WAC) 173-175-520 requires all owners of dams that pose a threat to life to complete an Emergency Action Plan (EAP). The Washington State Department of Ecology Dam Safety Office (EDSO) determines whether a dam poses a Significant or High hazard to life by using a Hazard Class system and assigning each dam an alpha-numeric rating based on the consequences to the downstream inundation area if the dam were to fail and the reservoir were released. Table 1 contains the different possible Hazard Class ratings that are assigned to each dam as defined by the EDSO (DOE 2017), including the lives at risk and the downstream risk level. According to WAC 173-175-520, dam owners of dams that are given downstream Hazard Classes of 1A, 1B, 1C, and 2 are required to develop and maintain an EAP.

Table 1. Downstream Hazard Classes for Dams (DOE 2017)

Hazard Class	Lives at Risk	Downstream Risk Level	EAP Required?
1A	>300	High	Yes
1B	31 to 300	High	Yes
1C	7 to 30	High	Yes
2*	1 to 6	Significant	Yes
2D	1 to 6	Significant	Yes
2E**	None	Significant	Yes***
3	None	Low	No

*Legacy class, all 2s will become 2Ds & 2Es

**Significant economic or environmental risk

***Not always required historically, but now being required (Per. Com. Lattimore 6/28/2017)

Historically, the EDSO assigned dams a Hazard Class of 2 if 1 to 6 lives were at risk and a Hazard Class of 3 if there were no lives at risk. The EDSO now replaces Hazard Class 2 for new and updated classifications with two different sub-classes, 2D and 2E (see Table 1), and currently requires an EAP be completed for dams in both 2D and 2E sub-classes (Per. Com. Lattimore 6/28/2017).

The EDSO also has the regulatory authority to enforce dam safety rules and regulations including requiring dam owners to maintain updated EAPs. According to Washington Administrative Code (WAC) 173-175-620, the Washington State Department of Ecology director has the authority to require dam owners to take actions to preserve the structural stability of the dam and reach levels of safety that are consistent with accepted engineering practices. WAC 173-175-620 then states, *“If the owner does not take action to correct safety issues in a timely manner, regulatory orders may be issued to require modifications, and to restrict the filling of the reservoir until all outstanding issues or problems are resolved to the satisfaction of the department.”*

2.1. Summary of EAP Acquisition and Availability

The Department of Ecology Inventory of Dams (DOE 2017) was used to create a list of dams with hazard classifications of 1A, 1B, 1C, or 2 that require the dam owner to develop an EAP

and have lives identified at risk. All dams with these hazard classifications that are located within King County were added to the list, in addition to dams with these classifications that were located outside of King County in Pierce and Snohomish counties but within drainages that flowed in to King County and are estimated to have an impact on King County residents and/or property in the event of a dam failure. EAPs were reviewed for dams on the Sultan River, Tolt River, Cedar River, Green River, and White River, along with numerous smaller streams. EAPs were also reviewed for dikes and detention pond dams across a wide range of municipalities within King County, and portions of Pierce, and Snohomish counties that drain into King County. Table 2 contains a summary of the dams on the list categorized by Hazard Class.

Table 2. Dams Impacting King County that Require EAPs (DOE 2017)

Hazard Class	Number of Dams Requiring EAPs
1A	9
1B	18
1C	39
2	29
2D	0
2E	2
Total	97

Due to the state's conclusion that no lives are at risk from the failure of dams that are rated as Hazard Class 2E (see Table 1), the two dams in King County identified as Hazard Class 2E in the DOE Inventory of Dams (Cedar Hills Landfill CSW Pond and SeaTac Airport SE Pond) were not evaluated for this report.

A list of EAPs that are available for review at the KCOEM and the King County Water and Land Resources Division (KCWL RD) was included as Addendum 1 in the 2017 King County Dam Safety Gap Analysis Report Request for Proposal, and seven of the EAPs were reviewed at the KCWL RD offices. A public records request for the remaining EAPs that were not available from KCOEM or KCWL RD was made with the EDSO. The EDSO responded quickly to the records request by making EAPs for 74 dams available electronically in PDF format on an FTP site, including two EAPs that were not located in the dam inventory and not part of the initial inventory used to create Table 2 but were included in the EAP review process for this report (369th St. Detention Pond and Corliss Enumclaw Gravel Pit). These two additional EAPs raised the total number of dams requiring EAPs to 97. The Corliss Enumclaw Gravel Pit did not have a specified Hazard Class in its EAP, but based on the information provided in the EAP that >7 people would be affected downstream, the dam was included as Hazard Class 1C for the purposes of this report.

The EDSO identified six additional EAPs it did not include in their response to the public records request that were still in draft form and in the process of being finalized by the dam owners. The owners of the remaining 10 dams on the compiled list of dams that required EAPs were contacted by Tetra Tech via phone and/or email. This effort yielded one EAP for the

Lakemont Detention Pond (formerly the High Park Detention Pond) and the following updates for five of the remaining dams, leaving EAPs for four dams undiscovered (see Table 3):

- Notification from Puget Sound Energy that the Federal Energy Regulatory Agency (FERC) in charge of the Snoqualmie Falls Diversion Dam does not require an EAP for the facility.
- Notification from Cascade Water Alliance that no separate EAP exists for the Lake Tapps Backflow Prevention Structure. After further review, the Backflow Prevention Structure was not included in this report as a failure would appear to only inundate the Printz Basin waterway and the upstream canal from the White River to the southeast.
- Notification from King County Department of Natural Resources and Parks (DNRP) Stormwater Services that a draft EAP for the Peterson Stormwater Detention Dam is currently in development.
- Notification from the City of Snohomish that the 4th Ave West Detention Pond has been downgraded by the EDSO and an EAP is no longer required.
- Notification from the City of Kent that preparation of a draft EAP is currently under way for the Muth Stormwater Pond.

The subsequent removal of the Snoqualmie Falls Diversion Dam, the 4th Ave West Detention Pond, and the Lake Tapps Backflow Prevention Structure lowered the total number of dams requiring EAPs down to 94 (see Table 3).

Table 3 provides an updated summary by hazard class of the number of EAPs obtained for review for this report and number of EAPs identified but not obtained. In total, 58 different EAPs were obtained covering 82 dams, with seven of the EAPs covering more than one dam. The EAP containing the most dams was the Lake Tapps EAP with 13 dams. Table 4 contains a summary of the dam owner types (public, private, or federal) for all of the dams with reviewed EAPs, and Figure 2 displays the location of the dams reviewed in this report, delineated by their Hazard Class. Table 5 details EAPs that were not obtained, the dam owner, and whether the owner is a public (7 total, all local) or private (5 total) entity. Table 5 also includes both the EAPs for the eight dams that were still in draft form as of June 2017 and the four remaining dams identified with possible EAPs that were not obtained; it was not possible to determine whether an EAP did or did not exist for these four dams as of early August 2017. Table 6 lists the four dams for which EAPs were not obtained along with their ownership, Hazard Class, maximum storage capacity, and dam height.

Table A-1 in Appendix A contains a complete list of all 82 dams with EAPs that were reviewed for this report.

Table 3. Summary of EAPs Obtained and Not Obtained for Review

Hazard Class	Dams Requiring EAPs (Updated)	Dams w/ EAPs Obtained	Dams w/ Draft EAPs But Not Obtained	Remaining Dams w/ Possible EAPs But Not Obtained
1A	9	9	0	0
1B	18	18	0	0
1C	40*	32*	5	3
2	27	23	3	1
2D	0	0	0	0
Total	94	82	8	4

*Includes one additional dam with no Hazard Class specified, estimated to be 1C based on EAP text

Table 4. Number of Reviewed EAPs by Dam Owner Type

Hazard Class	Dams with Reviewed EAPs, by Owner Type		
	Public (Local)	Private	Federal
1A	7	0	2
1B	9	9	0
1C	17	15	0
2	15	8	0
Total	48	32	2

Table 5. Number of not obtained EAPs (including Drafts) by Dam Owner Type

Hazard Class	Dams with Unobtained EAPs, by Owner Type	
	Public (Local)	Private
1A	0	0
1B	0	0
1C	3	5
2	4	0
Total	7	5

Table 6. Dams with Possible EAPs but not obtained

Dam Name	Dam Owner	Hazard Class	Max Storage (ac-ft)	Dam Height (ft)
Icon Materials Sediment Pond 6	Icon Materials	1C	200	120
Weyerhaeuser-Enumclaw Flood Control Dam	Weyerhaeuser	1C	140	30
Garrison Creek - 98th Avenue Detention Dam	City of Kent Public Works	1C	50	8
Klahanie Stormwater Detention Dam No. 2	City of Sammamish	2	14	6

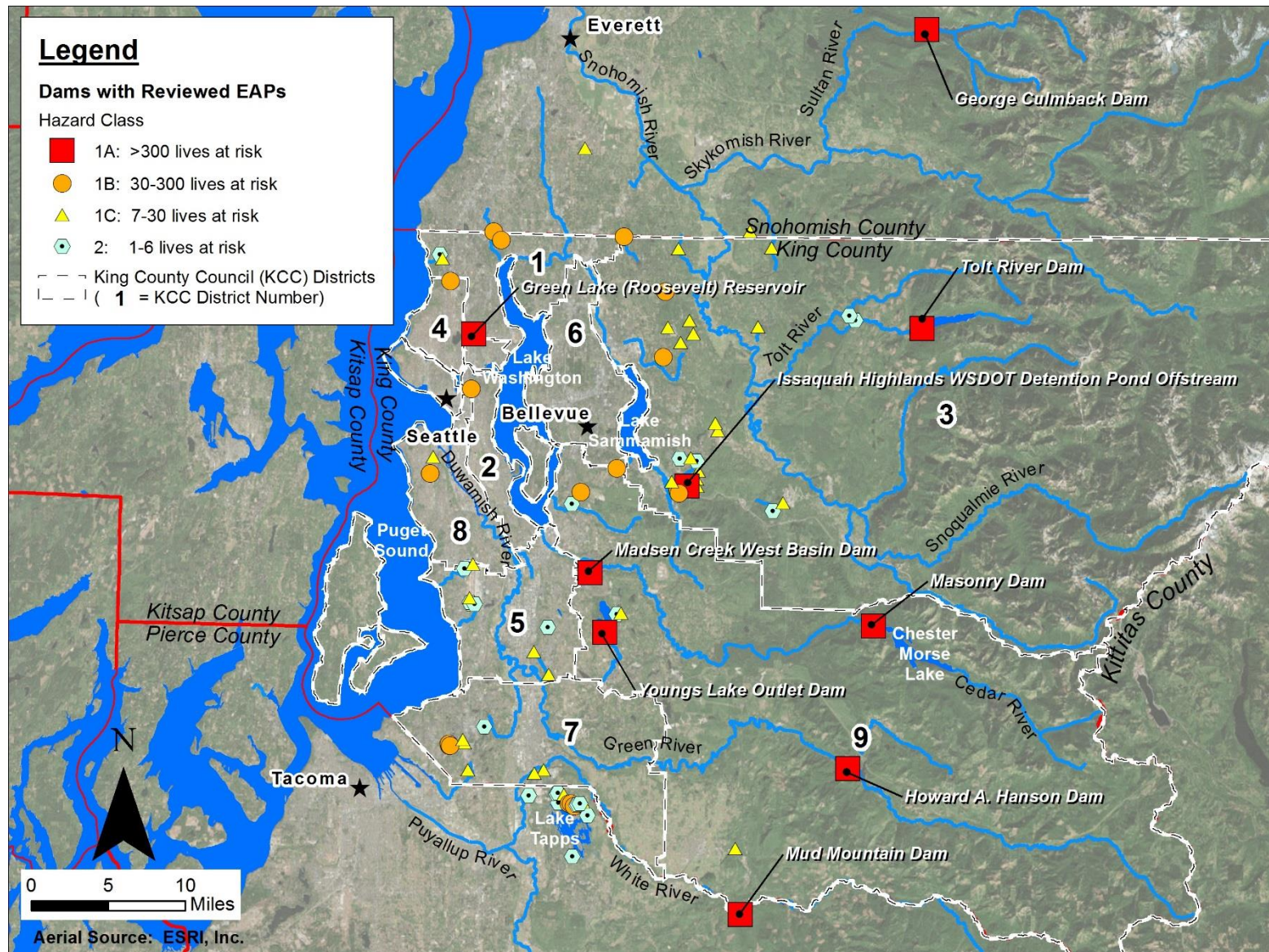


Figure 2. Dams with EAPs Reviewed

2.2. EAP Review Process

In order to effectively review the available EAPs, the proper content for the EAPs had to be determined and each required element within the document evaluated. These elements were evaluated for how recently they were updated, the detail of provided information about the dam and downstream area, the coverage of all possible emergency situations leading to a dam failure, and the quality and level of completeness of any included mapping products (inundation mapping, location/vicinity figures, etc).

The primary tool used to review and evaluate the EAPs was a checklist that was based on the structure and content of the EAPs themselves. The detailed EAP checklist included all of the relevant information required for an effective EAP and allowed for comparisons across the different EAPs for any of the specific elements that were reviewed. This checklist was developed in large part from a document created by the Washington State Department of Ecology Dam Safety Office (EDSO) that assists dam owners by detailing recommended Guidelines for Developing Dam Emergency Action Plans (EDSO Guidelines) and overall structure for each EAP (EDSO 2013)² The EDSO Guidelines include seven chapters recommended to be included in each dam's EAP with appendices containing additional information such as inundation mapping and dam structural drawings:

Chapter Layout for Emergency Action Plan (EDSO 2013)

- I: Purpose
- II: Basic EAP Data
- III: Five-step EAP Flowchart
- IV: Roles & Responsibilities
- V: Emergency Level Determination & Emergency Situations List
- VI: Five-step EAP Process
- VII: Maintenance
- Appendices (Including Inundation Mapping, Structural Drawings, etc)

The EDSO also provides a simplified emergency action plan form for dam owners of smaller dams that do not require as much information to detail for the response to a dam emergency (EDSO 2016)³. The EDSO Guidelines instruct dam owners to contact the EDSO to determine if the simplified form is appropriate for their dam. This simplified form functions more as a template for dam owners and consists mainly of Section VI from the Emergency Layout Plan displayed above, with the simplified plan specifying that the Appendices should contain some of the relevant information from the other Sections. The EDSO Guidelines also state that the EDSO will provide technical assistance with the preparation of the EAPs if needed and simplified inundation maps for dam owners who do not have the resources to hire an engineer.

² Guidelines for Developing Dam Emergency Action Plans: <https://fortress.wa.gov/ecy/publications/documents/9222.pdf>

³ Dam Safety – Simplified Emergency Action Plan Form: <https://fortress.wa.gov/ecy/publications/documents/ecy07037.pdf>

The detailed checklist developed from both the EDSO's detailed guidance and simplified EAP template was completed for every EAP obtained, with notes taken for any information within the EAPs that required additional understanding or further detail. The data in these reviews was then imported to a summary table that provided an efficient method to analyze the EAPs relative to each other.

2.3. Results of EAP Review and Gaps Identified

This section provides a summary of the review of the dam EAPs and identifies deficiencies, or gaps, between the current EAPs and content expected to be in the plans as described in the EDSO Guidelines.

2.3.1. Overall EAP Review Results

In total over 3,000 items were reviewed across 58 EAPs for 82 dams (seven EAPs included multiple dams including the EAP for Lake Tapps which included 13 dams) using the detailed checklist described in Section 2.2. The EAPs were reviewed in June 2017 and an initial numeric summary of all reviewed items relative to the EDSO Guidelines is displayed in Figure 3, with the level of completeness of reviewed items rated as "All Data", "Partial Data" or "No Data" and distributed by dam Hazard Class.

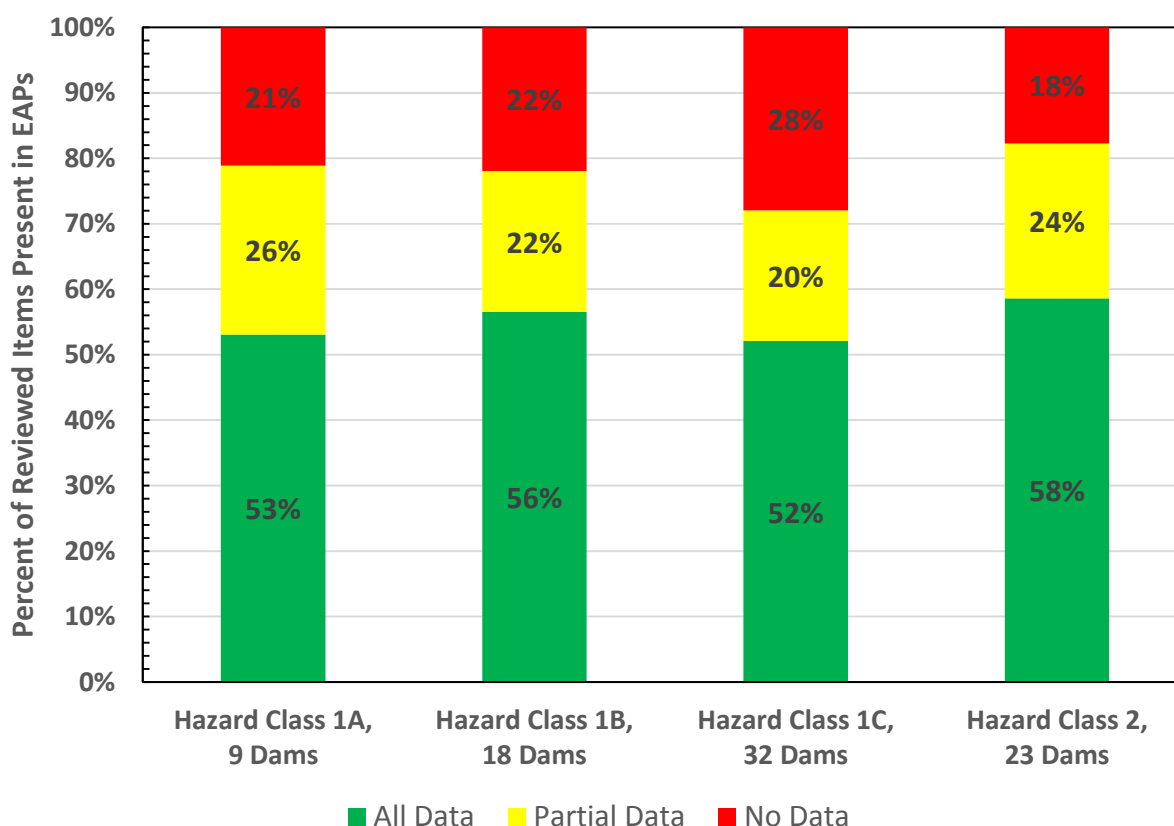


Figure 3. Summary of Completeness of Information Relative to EDSO Guidelines for All EAP Reviewed Items

The summary in Figure 3 shows a relatively consistent level of completeness across the dam hazard classes for each metric, with the items containing "No Data" showing the most variability

with a 10 percentage point range between 18% (Hazard Class 2 dams) and 28% Hazard Class 1C dams). Overall, the level of completeness is fairly consistent among the EAPs across the four Hazard Classes.

2.3.2. Detailed EAP Review Components

KCOEM's stated goal for this report in determining dam owner emergency readiness requires an evaluation of key components that the EDSO Guidelines recommend be included within each dam's EAP. To accomplish this Tetra Tech performed a review of each dam's EAP targeted toward the components in the EAPs that reflect the overall readiness of the dam owner to respond to a dam emergency. Included in the reviewed EAP components are the five steps that make up the EAP Process from the EDSO Guidelines, along with four other components that are important to a dam owner's emergency response readiness. The review process evaluated how well the dam's EAP answered the general questions associated with each of the components listed below:

- **Roles and Responsibilities:** During an emergency, who is supposed to do what?
- **Event Detection (EAP Step A):** How is an emergency event discovered?
- **Emergency Level Determination (EAP Step B):** How serious is the emergency event and how is it classified?
- **Notification and Communications (EAP Step C):** Who should be alerted about the emergency event and what should they be told?
- **Expected Actions (EAP Step D):** Based on the emergency level, what actions should be taken?
- **Event Termination (EAP Step E):** Who decides when the event has terminated and what information is that based on?
- **Training & Tabletop Exercises:** How often are trainings and tabletop exercises conducted?
- **Inundation Mapping:** Has inundation mapping been completed and how usable and informative is it during an emergency event?
- **EAP Up-to-Date:** When was the EAP last revised and updated?

Each of these components is a vital part of the emergency planning process for a dam failure event. The following subsections provide a summary of these components for all of the dam EAPs that were reviewed. The reviews identified whether all required information (All Data), only partial information (Partial Data), or no information (No Data) for each detailed review item was presented in the EAP. The partial information category represents the widest range of possible data compared to the binary outcomes of the other two categories as it encompasses levels of completeness from almost all of the information present to only a small amount of the information present.

Table A-2 in Appendix A summarizes the results of the detailed EAP component review for each dam. To assist in prioritization of recommendations presented in this report, the review results are grouped by the Hazard Class assigned to each dam.

2.3.2.1. Roles and Responsibilities

In the event of a potential dam failure situation, clearly defined Roles and Responsibilities for all of the parties involved in the emergency actions are part of the foundation of a thorough and useful emergency action plan according to the EDSO Guidelines. Any confusion regarding who is doing what in an emergency can harm any of the other important procedures during a dam failure situation. Figure 4 details the review results for the EAPs on inclusion of Roles and Responsibilities.

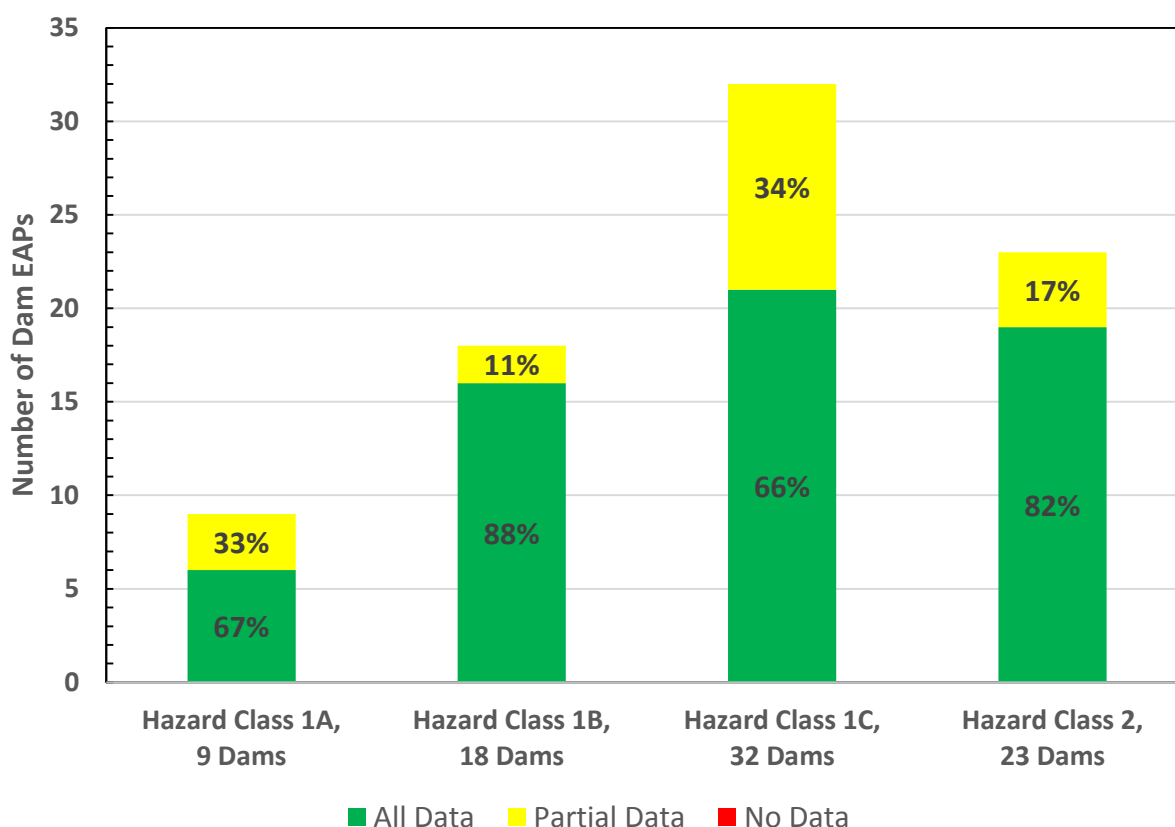


Figure 4. Completeness of Roles and Responsibility Information for Dam EAPs Reviewed

All of the EAPs reviewed had at least some information identified by the EDSO Guidelines regarding Roles and Responsibilities during a dam emergency. Dams with only partial information on Roles and Responsibilities typically include listing only the roles in a general sense, or the EAPs had a list of roles with a few responsibilities but they did not provide sufficient detail for their duties throughout the emergency for every emergency level until the event's termination.

2.3.2.2. Event Detection

The EDSO Guidelines stipulate that any unusual or emergency event at a dam must be identified in order for further efforts within the EAP to be put in motion. Conditions that could lead to such an event include reported earthquakes, inclement weather within the contributing upstream watershed leading to increased inflows, and any upstream dams that could have unusual or

emergency events of their own, and should be detailed. Anyone at or near the dam can report unusual or emergency events including members of the public, law enforcement, and anyone else in the area who observes conditions out of the ordinary. Methods to detect deficiencies to the dam's normal operations should also be included, such as inspections of the dam structure and spillway or monitoring of the impounded water body for any unusual changes in water surface elevation, or observations of abnormal seepage or boils. Figure 5 summarizes the results of the review for Event Detection information.

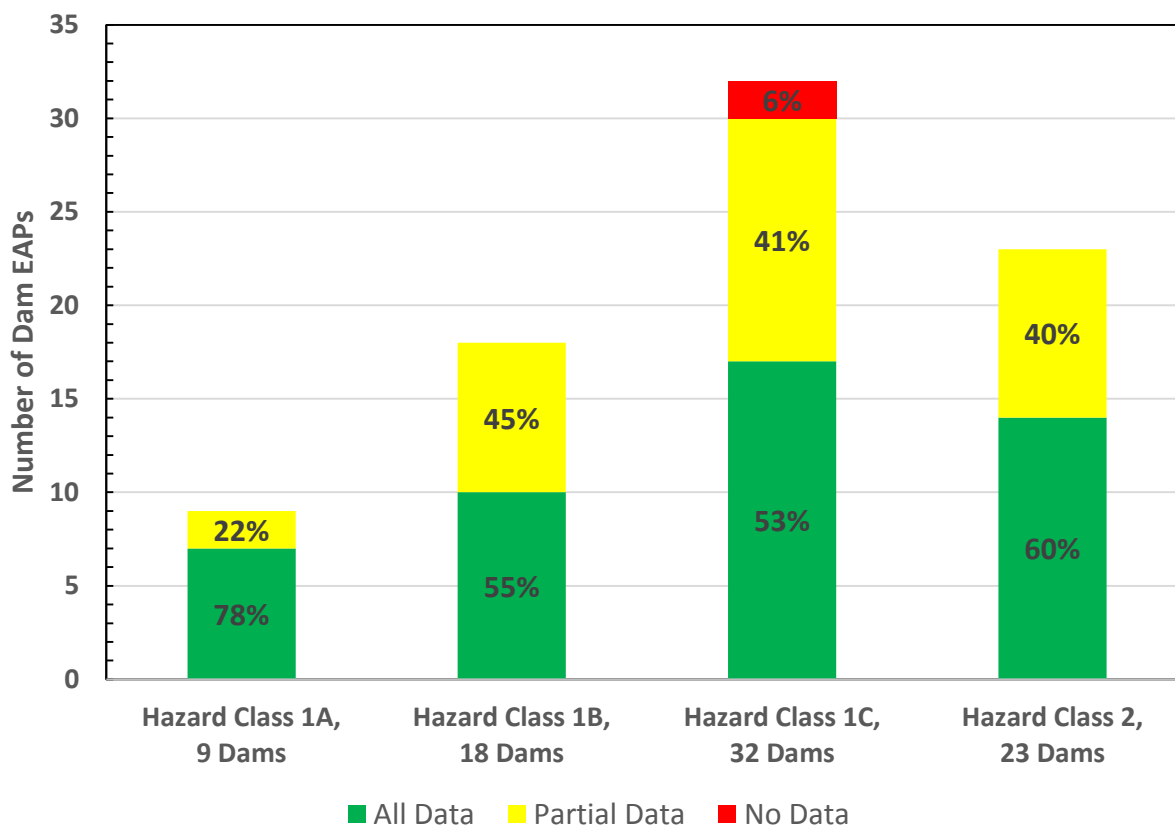


Figure 5. Completeness of Event Detection Information for Dam EAPs Reviewed

Figure 5 shows that two Hazard Class 1C dams, the Kitts Corner Detention Pond and the S 336th St Stormwater Detention Pond, had no Event Detection information in their EAPs while the remaining 80 dams have an EAP with at least some Event Detection information included. Typical partial information included incomplete descriptions of Event Detection for potential unusual or emergency events.

2.3.2.3. Emergency Level Determination

After the dam owner or representative is made aware of an unusual or emergency event, they are responsible for determining the appropriate Emergency Level for the event based on the observations reported about the event and classifying it as one of the three listed in the EDSO Guidelines :

- **Emergency Level 1 – Unusual event, slowly developing:** Event is not normal, there is no threat to the operation or structural integrity of dam, but there could be if left unchecked.
- **Emergency Level 2 – Potential Dam failure, rapidly developing:** Event may lead to dam failure and potential downstream flooding, but no immediate threat of dam failure. This level also includes uncontrolled flow through the dam's spillway that has already or is likely to cause minor flooding downstream with no effects to buildings or roads or significant risk to health, safety, or welfare.
- **Emergency Level 3– Urgent, dam failure is in progress or appears imminent:** Event has caused dam failure or is clearly about to fail, with flash flooding occurring downstream. This level also applies when spillway flow is flooding buildings or roads downstream.

Properly classifying the Emergency Level for the detected event is of critical importance in determining what steps should be followed within the EAP to protect downstream lives and structures. The review results for the inclusion of Emergency Level Determination information is displayed in Figure 6.

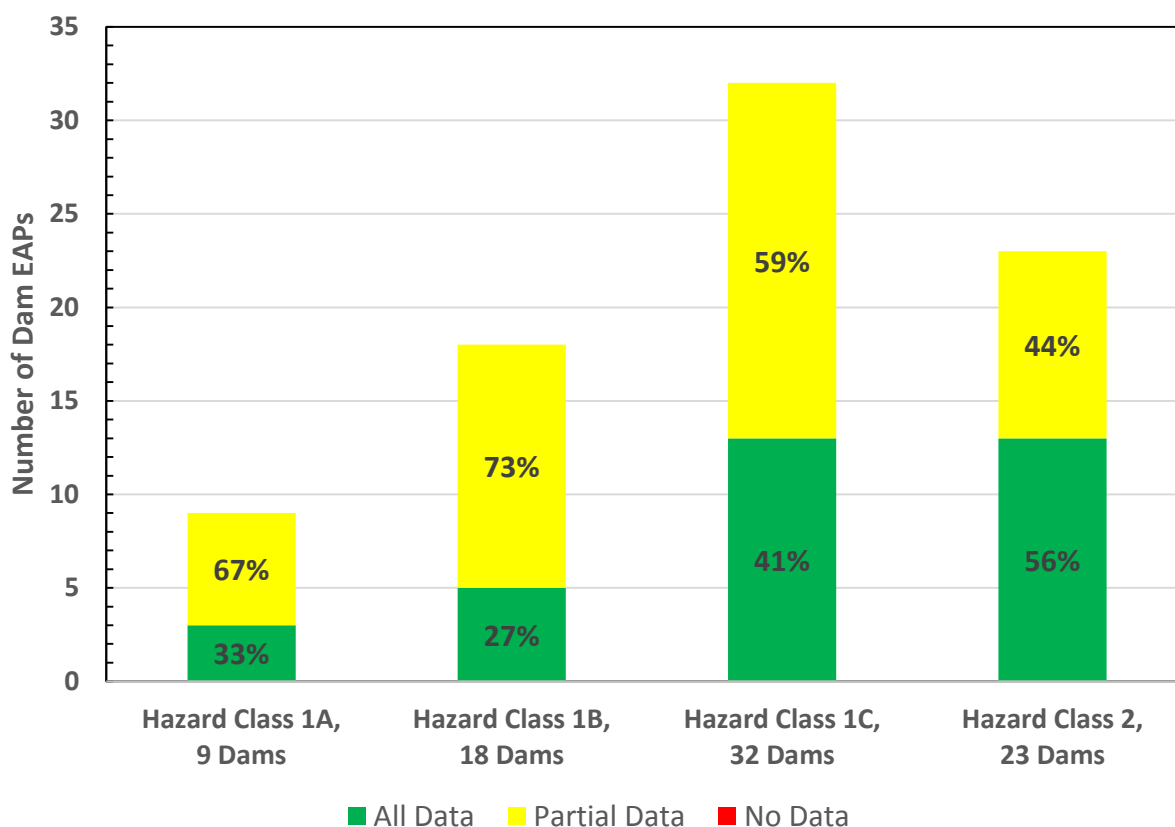


Figure 6. Completeness of Emergency Level Determination Information for Dam EAPs Reviewed

All of the reviewed dam EAPs had at least some information regarding the determination of Emergency Levels. Examples of partial information in the reviewed EAPs include general descriptions for each Emergency Level but no specifics on which types of events detected apply

to which Emergency Level, no information regarding pool elevations that correspond to Emergency Levels, and Emergency Level information not all located together within the EAP.

2.3.2.4. Notification and Communications

Once an event has been detected and the Emergency Level for the event has been determined, the EDSO Guidelines specify that each EAP should identify who is notified and communicated with using checklists that are based around the selected Emergency Level. Emergency Levels 2 and 3 require additional notification information due to their increased likelihood of risk to downstream people and structures. Figure 7 contains a summary of the completeness for Notification and Communication information found within the reviewed EAPs.

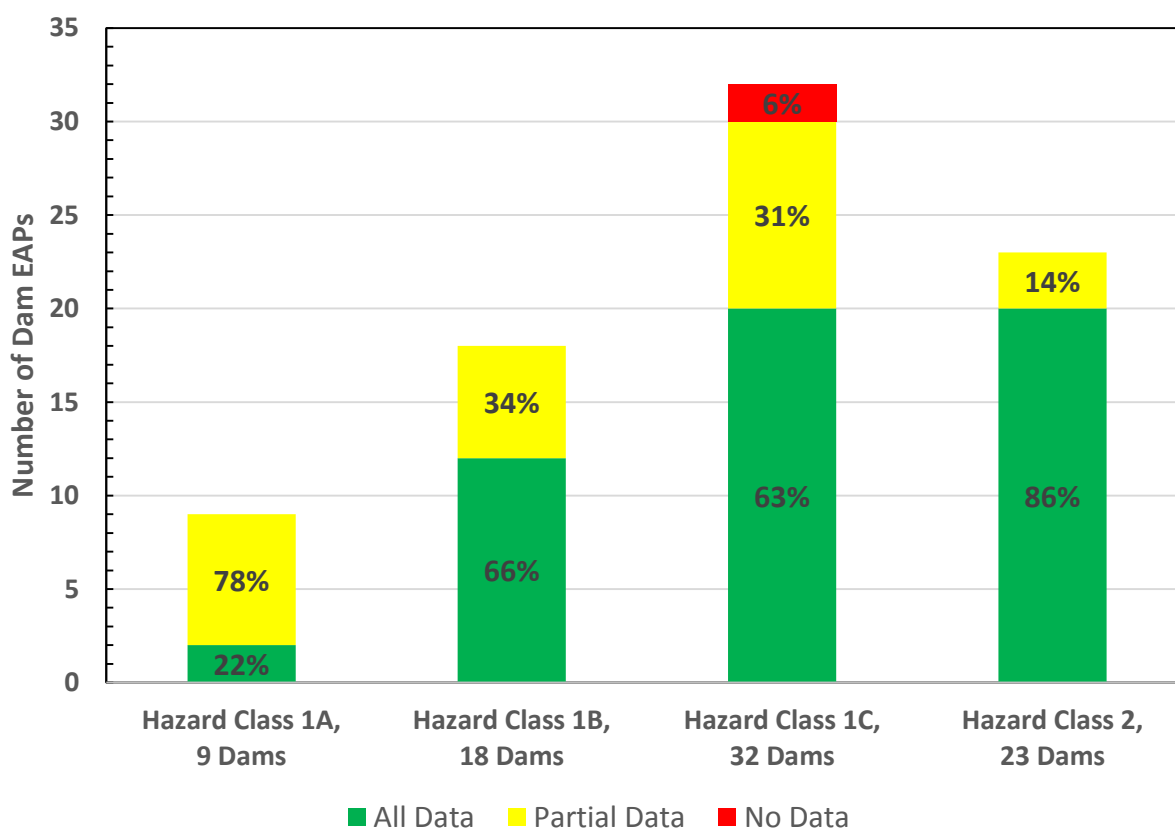


Figure 7. Completeness of Notification and Communications Information for Dam EAPs Reviewed

Fifty-four of the dams have all Notification and Communication information specified in the EDSO Guidelines. Kitts Corner Detention Pond and the S 336th St Stormwater Detention Pond are the two dams with EAPs that have no Notification and Communication information. The remaining dam EAPs have partial notification and communication information. Examples of partial information located in the reviewed EAPs include Notification Flowcharts for Emergency Levels 2 and 3 but not Level 1, contact lists not included in all locations recommended by the EDSO Guidelines, and general contact lists provided but lacking details for each possible Emergency Level.

2.3.2.5. Expected Actions

The EDSO Guidelines state that after the Emergency Level has been determined, the EAP should include a list of actions to be taken based on the Emergency Level. Some expected actions by the dam owner or representative include inspections of the entire dam if possible, adjusting dam operations, conducting dam repairs using available resources and supplies, documenting the unusual or emergency event in a log, and continued monitoring of conditions. The summary of completeness for the Expected Actions information in the reviewed EAPs is located in Figure 8.

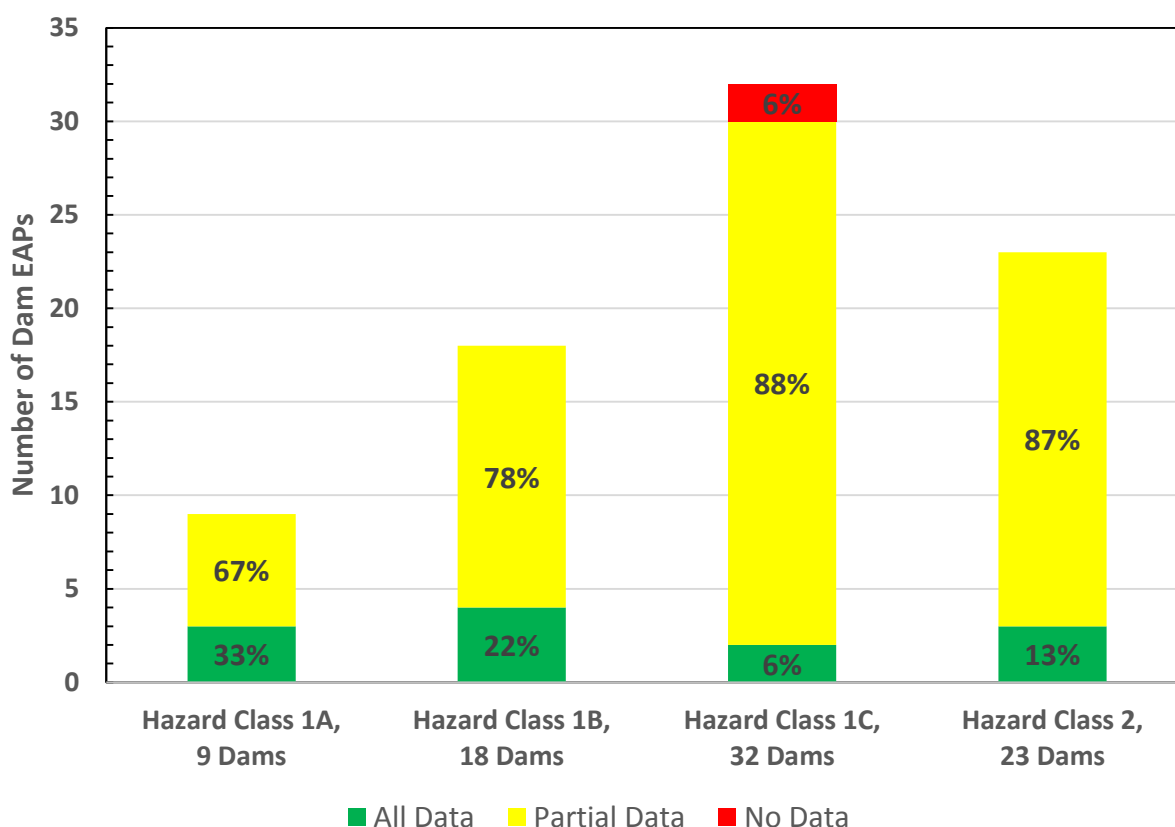


Figure 8. Completeness of Expected Actions Information for EAPs Reviewed

All but the Kitts Corner Detention Pond and the S 336th St Stormwater Detention Pond have EAPs with expected actions information included. The vast majority, 68 dams, have only partial Expected Actions information in the EAP. Examples of partial information in the reviewed EAPs include incomplete lists of actions for every Emergency Level, lack of lists containing emergency supplies and resources available near the dam, and failure to include an unusual/emergency event log to document observations and actions taken during the event.

2.3.2.6. Event Termination

The EDSO Guidelines describe that each EAP should include details and procedures for concluding the plan once the event is over. The person responsible for terminating the EAP for each possible Emergency Level should be identified and a Dam Emergency Event Report sheet

should be included to document the emergency. Figure 9 contains a summary of the completeness of Event Termination information included in the reviewed EAPs.

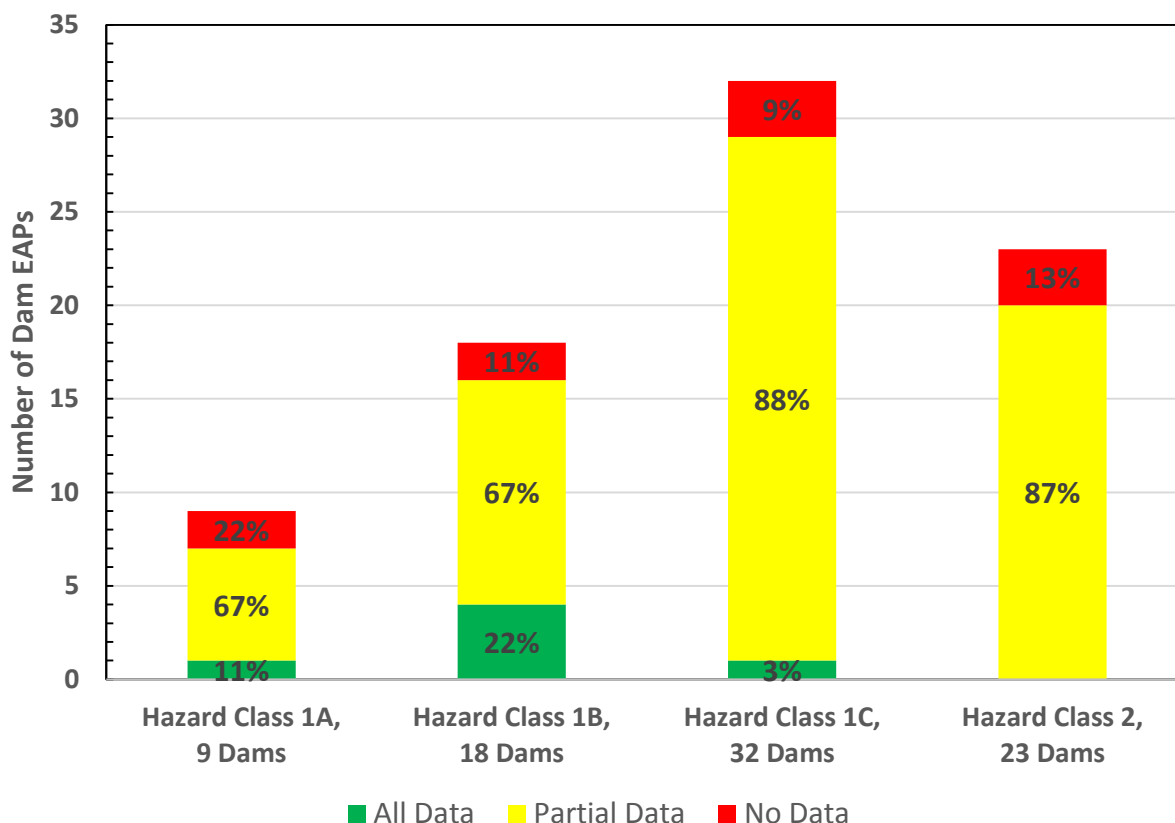


Figure 9. Completeness of Event Termination Information Dam EAPs Reviewed

Only 6 of the dams have complete Event Termination included in their EAPs. There were 10 dams with EAPs that did not have any Event Termination information, including two Hazard Class 1A dams. The EAPs with partial information typically had some descriptions of termination responsibilities but either the plan did not include all Emergency Levels in the Event Termination procedures or the EAP did not contain a Dam Emergency Report sheet to document the event.

2.3.2.7. Training and Tabletop Exercises

The EAP should include information detailing periodic Training and Tabletop Exercises, per EDSO Guidelines, that are undertaken in order to maintain readiness in the event of an emergency. EDSO Guidelines specify that dam owners in charge of dams classified as high hazard (Hazard Classes 1A, 1B, and 1C) and significant hazard (Hazard Classes 2, 2D, and 2E) should conduct annual orientations/training and phone drills, with tabletop and functional exercises conducted about every five years for high hazard dams. EAPs should include information related to trainings/orientations and records of any tabletop/functional exercises conducted along with lessons learned from those exercises. The evaluation of information located within the reviewed EAPs for Training and Tabletop/Functional exercises are shown in Figure 10 and Figure 11, respectively. Tabletop/Functional Exercise data are shown as “Yes” or

“No” as there was no partial data. The exercises were either conducted and documented or there was no record of the exercises being conducted.

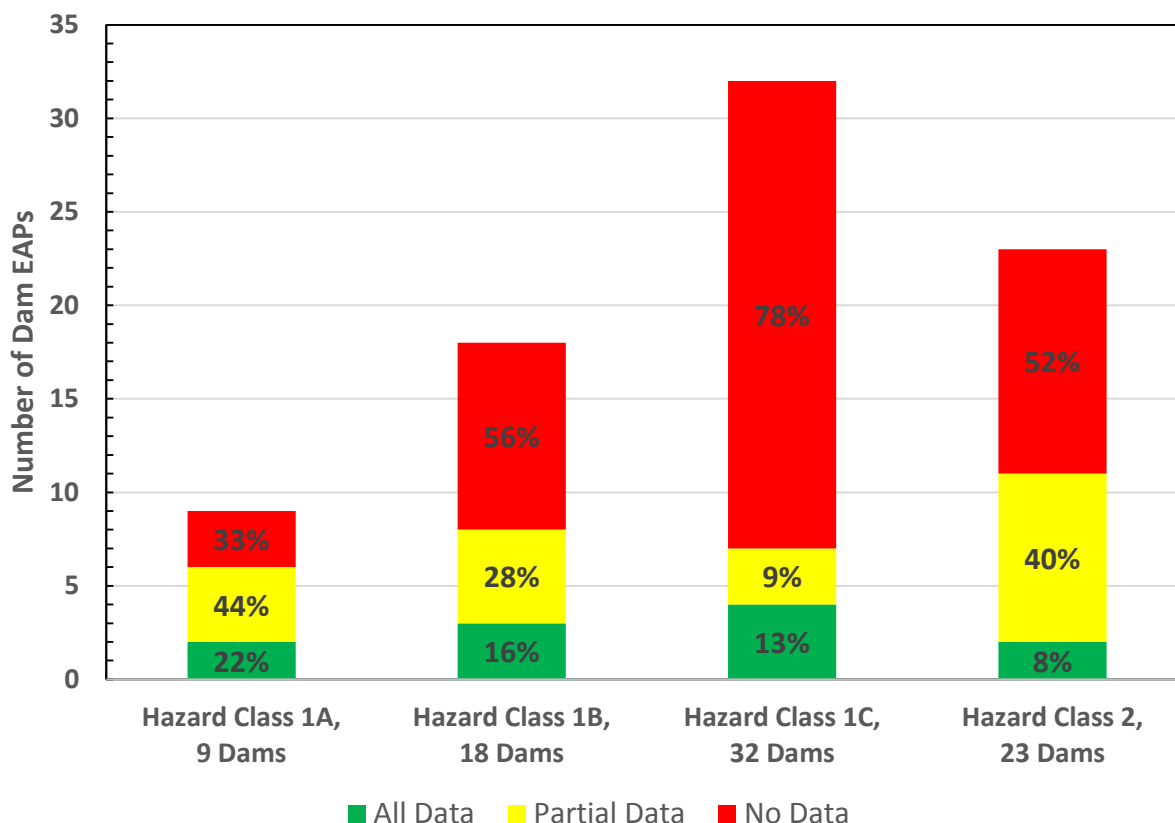


Figure 10. Completeness of Training Information Dam EAPs Reviewed

The EDSO Guidelines do not specifically require that documentation of Training be included in the EAPs, but for the purposes of this review each of the EAPs were graded on their inclusion of any Training information. Over half of the dams with reviewed EAPs did not contain any Training information as displayed in Figure 10, including 13 Hazard Class 1A and 1B dams. Partial information included in the EAPs consisted of the Training description sheet included in the EDSO Guidelines with no record of any trainings or orientations conducted.

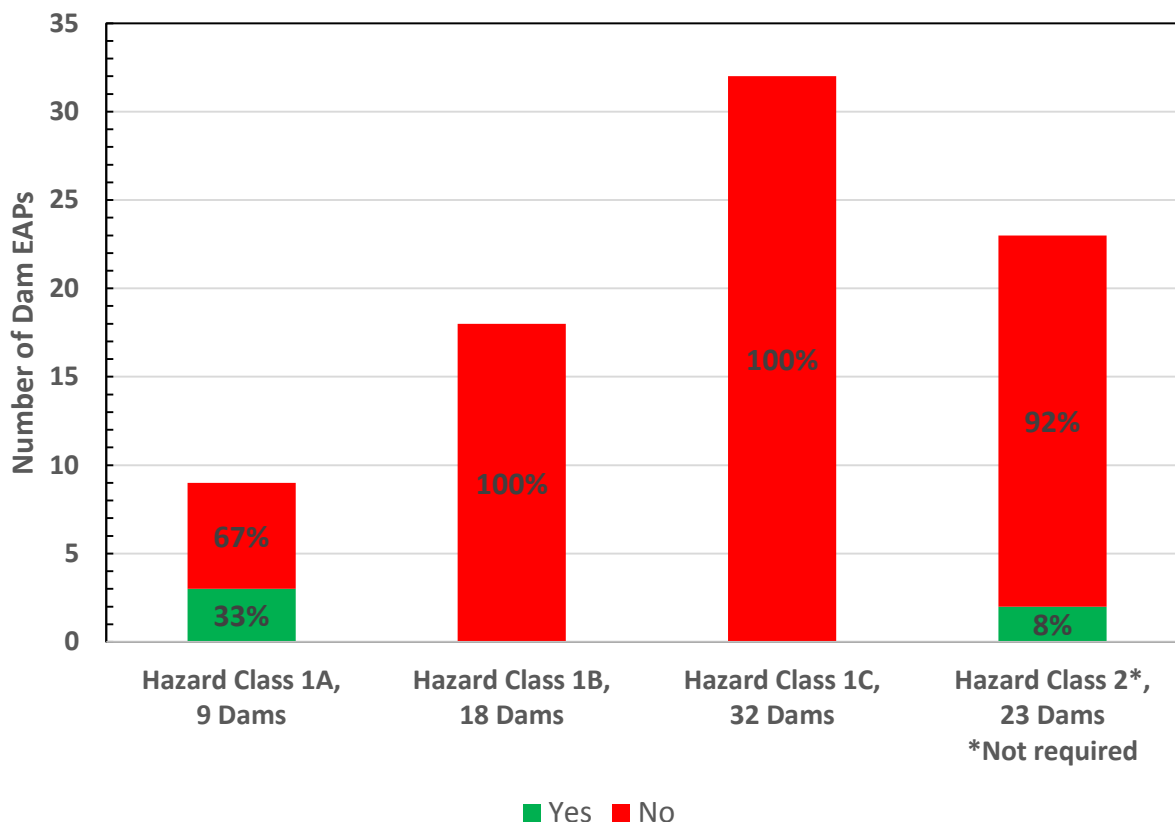


Figure 11. Documentation of Tabletop/Functional Exercises Conducted for Dam EAPs Reviewed

Only five of the dams in the reviewed EAPs had records of any kind of conducted tabletop exercises: the Tolt River Dam (Hazard Class 1A)/Tolt River Regulated Basin South Dam (Hazard Class 2)/Tolt River Regulated Basin West Dam (Hazard Class 2) in September 2016, Masonry Dam (Hazard Class 1A) in May 2011, and Culmbach Dam (Hazard Class 1A) in June 2010. Tabletop and Functional Exercises are not required for Hazard Class 2 dams per EDSO Guidelines, but are included in this report for reference.

2.3.2.8. Inundation Mapping

In order to determine the residences, other structures and the transportation network affected by the floodwaters resulting from an emergency event at the dam, the EAP must include an Inundation Map per EDSO Guidelines that clearly delineates the geographic extent of floodwaters in the event of a dam failure during both normal pool non-flood conditions (or “Sunny Day”), and when the dam reservoir is at its maximum storage elevation during extreme flood conditions. Inundation Maps should identify major roads and critical infrastructure facilities such as wastewater treatment plants, electrical substations, levees, and sewage pump stations. The included Inundation Map should also include the approximate time it takes after the dam failure for floodwaters to reach the first homes downstream of the dam, as well as any businesses or roads that could be affected by floodwaters. Figure 12 contains a summary of the Inundation Maps available in the reviewed EAPs.

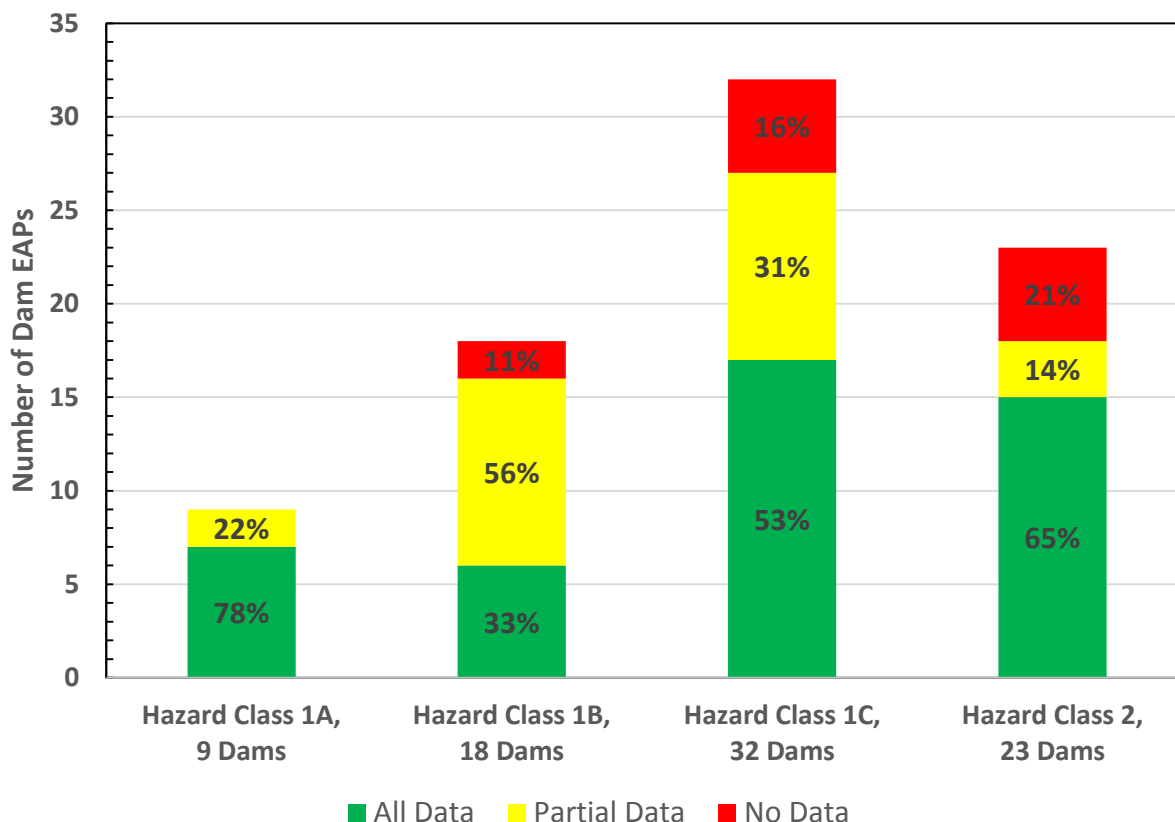


Figure 12. Completeness of Inundation Maps in the Dam EAPs Reviewed

Ten of the dams with reviewed EAPs did not have inundation mapping, including two Hazard Class 1B dams. All of the Hazard Class 1A dams had inundation mapping at some level. Inundation mapping was rated as partial information if the maps were not easily legible, did not contain sufficient detail to be quickly used in an emergency, did not contain the appropriate infrastructure information, or were completed prior to the last update to the Probable Maximum Precipitation (PMP) estimates for the Pacific Northwest in October 1994 in Hydrometeorological Report No. 57 (NWS 1994).

2.3.2.9. EAP Revisions

The EDSO Guidelines indicate Emergency Action Plans must be updated regularly to ensure that the information within the plan is correct and current so that it can be used quickly and effectively in an emergency situation. Notification charts must be updated to ensure emergency contact numbers are current, roles and responsibilities for the dam operators and emergency services officials need to remain current for successful coordination efforts, inundation mapping should be updated to include any new developed areas that could be affected by floodwaters, and downstream property information must be updated to make sure any new residents and/or property owners are included in the “lives at risk” metric used to estimate the dam’s Hazard Class.

Figure 13 identifies the time period since the most recent updates that have been made to the EAPs, delineated by Hazard Class. If an EAP did not contain any record of updates, the EAP's date of creation was used.

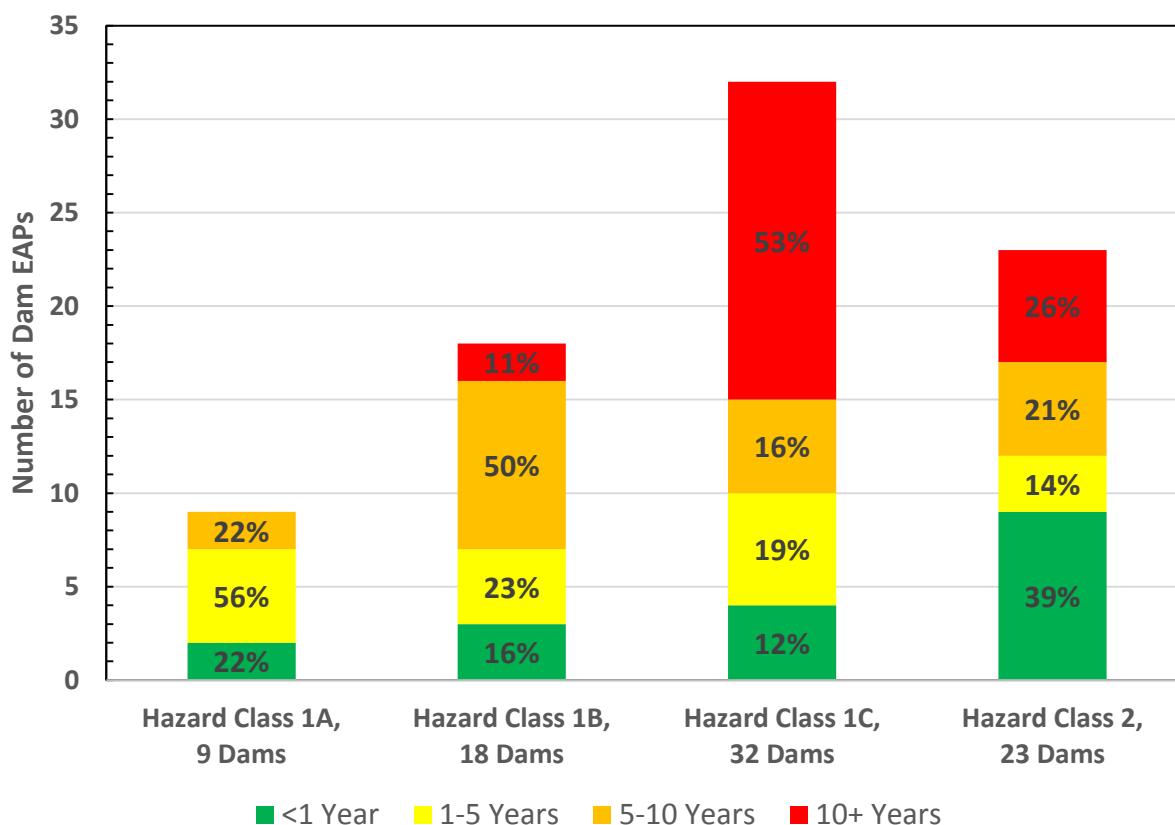


Figure 13. Number of Years since Dam EAPs Last Updated

Figure 13 shows that all of the Hazard Class 1A dams have had their EAPs updated in the last 10 years, with most of the Hazard Class 1B dams also updated in the last 10 years. Five of the Hazard Class 1A and 1B dam EAPs have been updated in the past year. However, over half of the dams with EAPs that were reviewed for this report have not been updated in the last 5 years. Over half of the Hazard Class 1C dams, 19 in total, have EAPs that have not been updated in more than 10 years. The out of date items would include the contact information for the notification flow charts that are essential for quickly and effectively executing an EAP.

2.4. Estimates for Costs to Update Gaps

In order to assist KCOEM in estimating the potential costs to dam owners that are needed to update the identified gaps in the EAPs as detailed in Section 2.3, this section includes a summary of the estimated costs to dam owners to update the associated EAPs for what are defined as small storage, medium storage, large storage, and very large storage dams. The costs are broken out in this manner due to dam storage size being a primary indicator of the potential complexity of updating various components of the EAP for a given dam, such as the inundation mapping and the tabletop exercises. Table 7 contains the dam size categories defined for this report based on

maximum acre-feet of storage. Table 8 presents the estimated costs for the different categories of component information separated out by the dam sizes in Table 7.

Table 7. Dam Sizes for Cost Estimating

Dam Size	Max Storage (ac-ft)
Small Storage	0 - 50
Medium Storage	50 – 10,000
Large Storage	10,000 – 50,000
Very Large Storage	50,000+

Table 8. Dam Sizes for Cost Estimating

EAP Component	Dam Size			
	Small Storage	Medium Storage	Large Storage	Very Large Storage
Administrative Updates: Basic Data, Contact Lists, Material Lists, etc	\$1,000	\$1,500	\$2,500	\$4,000
Procedural Updates: Roles & Responsibilities, Emergency Levels, etc	\$200	\$300	\$400	\$500
Technical Updates: Hydrology and Hydraulic Study, Inundation Mapping	\$30,000	\$75,000	\$150,000	\$250,000
Tabletop Exercises: Exercise development, facilitation, and after action reports	\$3,000+	\$4,500+	\$7,500+	\$15,000+

3. EVACUATION PLAN REVIEWS

3.1. Document Review

In conducting the assessment, Tetra Tech identified, consulted and reviewed the following plans relevant to the Warning and Evacuation functions:

- King County Comprehensive Emergency Management Plan (KCOEM, 2016)
- King County CEMP, Evacuation Incident Annex (KCOEM, 2014a)
- King County ESF 2 (Communications) Document (KCOEM, 2014b)
- King County OEM Duty Officer SOG: Dam Failure (KCOEM, 2017)
- King County Fire Procedure, Section 11 (KCOEM, 2015)
- Washington State Comprehensive Emergency Management Plan, Basic Plan (Washington State Department of Emergency Management, 2016a)
- Washington State CEMP, ESF#2 Annex (2016b)

The Warning and Evacuation function in King County is primarily detailed in two documents:

- Comprehensive Emergency Management Plan (CEMP) (KCOEM, 2016): provides broad guidance on concepts, policies and authorities. Outlines how the Evacuation function integrates into the larger emergency management organization.
- King County CEMP, Evacuation Incident Annex (KCOEM, 2014a): Primarily defines County agency/stakeholder roles and responsibilities; provides a 6-phase concept of operations.

The relationship of these two documents is shown below in Figure 14 along with other additional documents referenced.

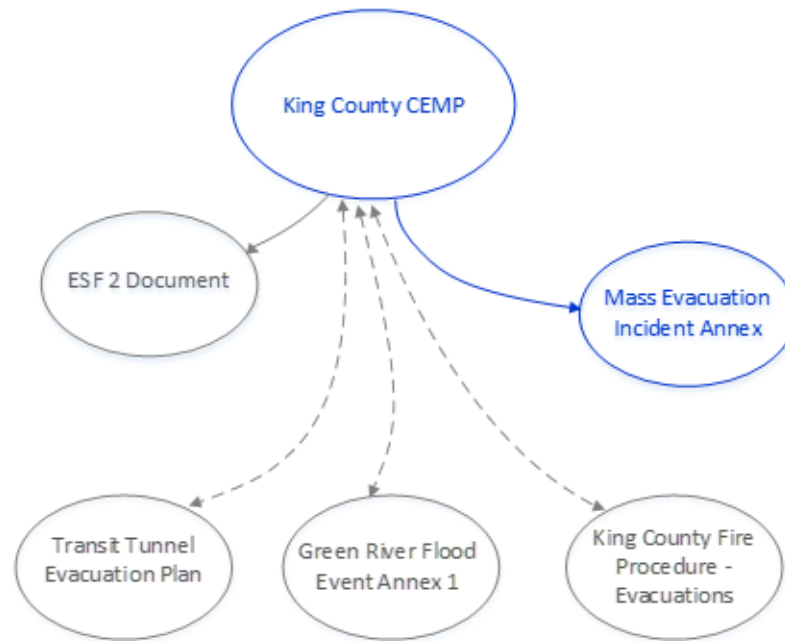


Figure 14. King County Evacuation Planning Documents Relationships

3.2. Methodology

Tetra Tech developed a customized Evacuation Plans crosswalk tool incorporating more than 65 emergency management industry standards, best practices, and guidelines. See Appendix B: Evacuation Plans Assessment Tool. For each evaluated element, the requirement/guidance is listed along with the location in the source document. Each element is scored as satisfactory, partially meets requirements/guidance, or needs improvement. For each element, a brief explanation is provided of the finding and the rationale if needed.

Tetra Tech conducted a basic Hazus analysis (GIS-based methodology that contains models for estimating potential losses due to natural disasters) of eight potential worst-case dam failure scenarios to identify the maximum number of residents that could be impacted in King County. This provides the maximum range of warning and evacuation capabilities required for this hazard – see Table 9 below.⁴ In this model, Mud Mountain and Howard Hanson provide the largest numbers of potentially affected populations at 24,880 and 20,845 respectively.

⁴ For each dam failure scenario, the number of residential buildings in the potential inundation area was determined by utilizing the general building stock compiled by Tetra Tech for the County's 2013 Regional Hazard Mitigation Plan. Estimates for the potentially affected population were developed by multiplying the Census QuickFacts King County persons per household 2011-2015 factor (2.45) by the number of residential buildings within the boundary of the dam inundation area. Note: This approach does not account for any new residential structures constructed since 2013.

Table 9. Hazus Model Summary of Potential Impacts of Major Dam Failure Scenarios

Dam Failure Scenario	Total Area (Acres)⁵	Residential Buildings in Inundation Area⁶	Estimated Population in Inundation Area⁷
Culmbach Dam	56,638	59	145
Howard Hanson Sunny Day (Normal High Pool)	39,241	2,545	6,235
Howard Hanson Probable Maximum Flood (Maximum Pool)	62,192	8,508	20,845
Lake Youngs Sunny Day	1,579	873	2,139
Lake Youngs Probable Maximum Flood	3,992	1,120	2,744
Mud Mountain Sunny Day	6,918	829	2,031
Mud Mountain Probable Maximum Flood (Top of Dam)	59,599	9,992	24,480
South Fork Tolt River Probable Maximum Flood	50,746	935	2,291

3.3. Key Findings

1. Dam failure represents a hazard that could require the evacuation of up to 25,000 County residents. While not the largest potential hazard, the topography and relative lack of roadways in the evacuation areas, and the potential for ongoing flood conditions at the onset of a dam safety emergency could impact the speed and effectiveness of evacuation operations.
2. King County is substantially prepared and has the majority of concepts, policies, authorities and tools in place to accomplish the warning mission in response to an actual or potential dam failure event.
3. The Evacuation Incident Annex contains most of the required/recommended elements. However, the Annex has not been validated via exercises or utilized in an actual incident. The Annex is not widely known to stakeholders. The recent revision of the County CEMP provides a notable opportunity to revise, socialize and exercise the Annex.
4. Integration of additional guidance and resources to address individuals with Access and Functional Needs (AFN) may be warranted. For example, procedures should be outlined

⁵ Total acreage includes inundation areas outside of King County.

⁶ Only considers buildings in King County portion of inundation area

⁷ Only considers population in King County portion of inundation area

for identifying and assisting those residents and visitors that may require evacuation assistance.

5. Additional work by KCOEM to identify and inventory current evacuation capabilities will allow for a more detailed gap analysis than possible in this report. The gap analysis could assist the County and its stakeholders to determine if they may be potentially challenged by shortages in trained personnel, equipment and supplies relative to a worst-case dam failure event.
6. Although Warning concepts are integrated into the Mass Evacuation Annex, there is the potential for a single point of failure at the KCOEM Duty Officer in receiving dam failure threat intelligence and executing the warning function. Dam failure Emergency Action Plans and potential inundation areas are not directly tied to the County's warning systems. See "Dam Failure Warning Process" below.

3.4. Dam Failure Warning Process

Given that warning is critical to the success of any evacuation effort, this section outlines warning factors relevant to the dam failure hazard. Currently, in the event of an actual or potential dam failure, the dam owner activates their Emergency Action Plan (EAP) and notifies key stakeholders including the KCOEM Duty Officer and/or the local PSAP (Public Safety Answering Point) which then notifies the KCOEM Duty Officer. Potential dam failure intelligence may also be developed by the King County Flood Warning Center. The Duty Officer follows the Standard Operating Guide (SOG) for Dam Failure. These actions include:

1. Notifying the OEM Director/Deputy Director
2. Preparing the CodeRed automated warning system
 - Select the audience that matches the EAP outflow (inundation map)
 - Select the appropriate pre-scripted warning message (imminent failure, structural problem, or correction)
3. Sending the warning message
4. Making notifications:
 - King County Flood Warning Center
 - Puget Sound Energy
 - Williams Pipeline

Per the Regional Hazard Mitigation Plan, "King County and its planning partners have established protocols for flood warning and response to imminent dam failure in the flood warning portion of its adopted emergency operations plan. These protocols are tied to the emergency action plans created by the dam owners."

However, in many cases, the dam EAPs are currently not available to KCOEM staff or are incomplete and the inundation maps are not pre-loaded into the automated warning systems. Hard copies of the available EAPs are located in the ECC. This requires the KCOEM Duty Officer to locate the specific dam EAP, evaluate the inundation map, and manually outline the

potential inundation area into the warning system. This could delay the warning and potentially omit some areas while including others that would not be impacted.

The ESF 2 (Communications) Annex states “The high risk population will require a variety of warning systems (e.g. siren, EAS, King County alerts RPIN, door-to-door) that can address the population’s diverse communications needs (e.g. auditory impairment, visual impairment, limited English proficiency).” However, it is unclear how the EAPs for each dam would directly correspond to the appropriate and available warning system for that specific geographic area.

4. MASS CARE & SHELTERING PLAN REVIEWS

4.1. Document Review

In conducting the assessment, Tetra Tech identified, consulted, and reviewed the following plans relevant to the Mass Care and Shelter function:

- King County Comprehensive Emergency Management Plan (KCOEM, 2016)
- King County CEMP, ESF 6 Annex – Mass Care, Emergency Assistance, Housing & Human Services (KCOEM, 2014c)
- King County CEMP, Regional Shelter Operations Annex (KCOEM, 2015)
- King County OEM Duty Officer SOG: Dam Failure (KCOEM, 2017)
- Washington State Comprehensive Emergency Management Plan, Basic Plan (Washington State Department of Emergency Management, 2016a)
- Washington State CEMP, ESF#6 Annex (Washington State Department of Emergency Management, 2016b)
- Washington State CEMP, Catastrophic Incident Annex (Washington State Department of Emergency Management, 2013)

The Mass Care & Shelter function in King County is primarily detailed in three documents:

- Comprehensive Emergency Management Plan (CEMP) (KCOEM, 2014a): Provides broad guidance on concepts, policies and authorities. Outlines how ESF-6 integrates into the larger emergency management organization.
- ESF-6 Document (KCOEM, 2014c): Primarily defines County agency/stakeholder roles and responsibilities; establishes the ‘Task Force’ approach to addressing key Mass Care & Shelter functions (ex. feeding).
- Regional Shelter Operations Annex (RSOA) (KCOEM, 2015): Provides detailed procedures, tools, and forms specific to development and operation of congregate and animal shelters that will serve more than one jurisdiction.

The relationship of these three documents is shown below in Figure 15 along with other additional documents referenced by these three.

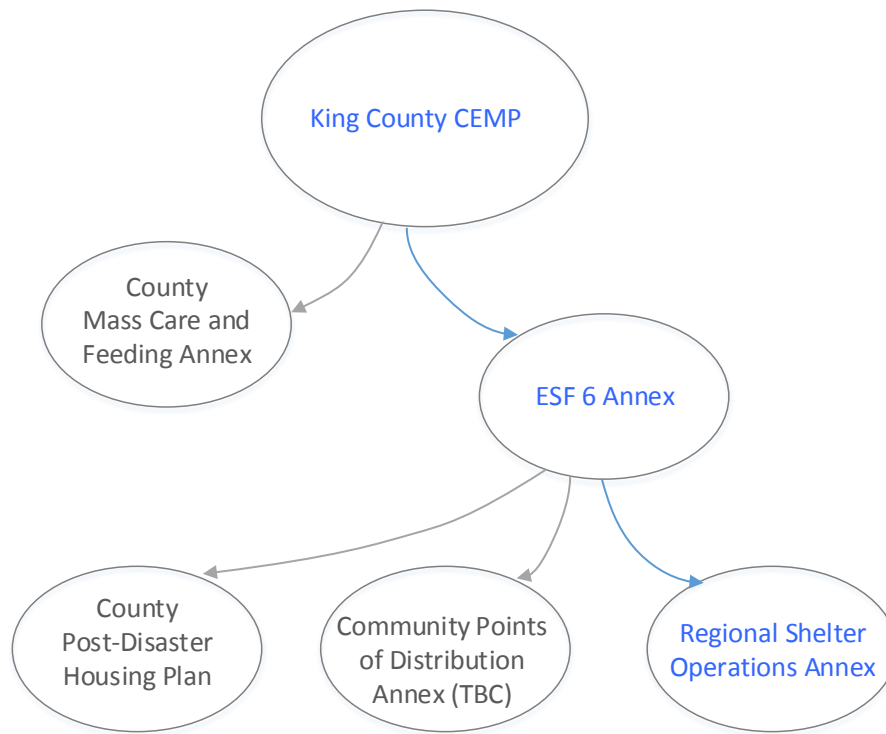


Figure 15. King County Mass Care & Shelter Planning Documents Relationships.

4.2. Methodology

Tetra Tech developed a customized Mass Care and Shelter Plans crosswalk tool incorporating more than 90 emergency management industry standards, best practices, and guidelines. See Appendix C: Mass Care and Shelter Plans Assessment Tool. For each evaluated element, the requirement/guidance is listed along with the location in the source document. Each element is scored as needs improvement, partially meets requirements/guidance or as satisfactory. For each element, a brief explanation is provided of the finding and the rationale if needed.

4.3. Key Findings

1. King County is substantially prepared and has the large majority of concepts, policies, authorities and tools in place to accomplish the mass care and shelter mission in response to an actual or potential dam failure event. However, ESF-6 Annex has not been validated via exercises or utilized in an actual incident. The Annex is not widely known to stakeholders. The recent revision of the County CEMP provides a notable opportunity to revise the ESF-6 Annex.
2. Integration of additional guidance and resources to address individuals with Access and Functional Needs (AFN) may be warranted.
3. Additional work by KCOEM to identify and inventory current mass care and shelter capabilities will allow for a more detailed gap analysis than possible in this report. The gap analysis could assist the County and its stakeholders to determine if they may be potentially challenged by shortages in trained personnel, equipment and supplies relative to a worst-case dam failure event.
4. In each planning document, the congregate sheltering function is the most developed. Mass feeding, distribution of supplies, and family reunification are not addressed at the same level of detail. There may also be an over-reliance on the American Red Cross for many functions.⁸

4.4. Defining the Scope of Mass Care and Shelter (ESF-6)

The County's current Mass Care and Shelter documents differ slightly in their scope of functions. For example, while adopting the ESF concept, the County's ESF 6 Annex indicates that the following services constitute Mass Care:

1. Sheltering
2. Pet and Livestock Sheltering
3. Post-Disaster Interim Housing
4. Community Points of Distribution (CPODs)
5. Coordination and support of ESF-8 re Alternate Care Facilities

⁸ Washington State, 2016 Cascadia Rising Exercise After Action Report, <https://www.documentcloud.org/documents/3152696-CR16-State-AAR-Final-Draft-Oct-21-2016.html>

The Washington State ESF-6 Annex aligns with the National Response Framework and indicates four primary functions:

1. Mass Care (sheltering, feeding, distribution of supplies, family reunification)
2. Emergency Assistance (coordination of voluntary organizations, donations, and volunteers, non-congregate and transitional sheltering, support to individuals that may require assistance in congregate shelters, support to mass evacuations, and care for service animals/pets)
3. Temporary Housing (rental, repair, and loan assistance, replacement or construction, provision of accessible housing, and access to other housing resources)
4. Human Services (loans/grants, nutrition assistance, crisis counseling, disaster unemployment, disaster legal services, child care, housing vouchers, etc.)

Finally, the National Mass Care Strategy defines six Mass Care components:

1. Sheltering
2. Feeding / Water / Sanitation
3. Distribution of emergency supplies
4. Family reunification services
5. Immediate health, behavioral health, social and spiritual care services
6. Access to information

5. PUBLIC EDUCATION

5.1. Document Review

In conducting our assessment, Tetra Tech identified, consulted, and reviewed the following potential sources of dam safety public education materials:

- King County Office of Emergency Management
- King County River and Floodplain Management Section
- Seattle Public Utilities
- Washington State Dept. of Emergency Management
- Washington State Dept. of Ecology
- FEMA Dam Safety Program and Emergency Management Institute
- Association of State Dam Safety Officials (ASDSO)
- Survey of the Effectiveness of Individual and Community Preparedness in King County (KCOEM, 2012)

5.2. Methodology

Tetra Tech reviewed the available hazard-specific public education and outreach approaches, materials, tools, methods, and other information to catalogue existing efforts and assess them against program goals. Programs, materials, and approaches were assessed in accordance with Chapter 7.7 of NFPA 1600 as well as the Public Awareness and Public Education for Disaster Risk Reduction (International Federation of Red Cross and Red Crescent Societies, 2011). The assessment considered four primary principles:

- Consistency and standard messaging
- Legitimacy and credibility
- Scalability
- Sustainability

The assessment reviewed tools including:

- Publications
- Curricula
- E-learning
- A/V materials
- Social media
- Telecommunications

5.3. Key Findings

1. Like most jurisdictions, the public education materials regarding dam safety for local residents in King County are not as extensive as for other natural hazards such as earthquakes and floods. Most of the materials available are not developed for any specific dams - Seattle Public Utilities is the exception. See Table 10 below for a list of all available dam safety public education materials.
2. No dam safety public education materials are available in King County in languages other than English and are not available in other formats (i.e. Braille, recording).
3. Dam failure inundation zone maps are not generally available to the public. The lack of such maps is a significant factor in residents not knowing that they live in a dam failure inundation zone.
4. The public has very little information available on dam failure inundation zones. Absent a risk being brought to their attention, most residents do not seek out this information, which is not generally available to them in any case.
5. To successfully educate the public about the risks associated with dam failure, local agencies and jurisdictions would need to move beyond the traditional passive provision of information. A shift in culture would be needed that would engage dam owners, safety professionals, individuals and property owners at risk. See “Dam Safety and Public Education” below.
6. Perceptions regarding Dam Safety and other hazards were not assessed in the 2012 Community Preparedness Survey.

5.4. Dam Safety and Public Education

According to the Department of Ecology Inventory of Dams (DOE 2017), King County contains 127 dams that have the storage area to impound 10 acre-feet of water or more. Eight of those dams (including Mud Mountain Dam, which is located in both King and Pierce counties) are Hazard Class 1A (i.e. where a dam failure event could put over 300 lives at risk) which is the highest-hazard classification for state regulated dams. Twenty-five dams that can impound at least 10 acre-feet and are located in Pierce County or Snohomish County also have the potential to impact King County residents and property including Culmback Dam, a Hazard Class 1A dam located in Snohomish County. Despite the number of dams that could impact King County communities, concern over dam failure is not high, likely due to the relatively low probability of occurrence relative to other natural hazards or man-made threats. The Regional Hazard Mitigation Plan (RHMP) assessment rates dam failure as Low Risk.

Per the County’s RHMP, “Downstream populations are often not aware that they are located in a dam failure inundation area and do not know the risks associated with probable dam failure. Balancing the need to address security concerns and the need to inform the public of the risk associated with dam failure is a challenge for public officials.” The American Society of Dam Safety Officials (ADSDO) indicates that although administrators of state [dam safety] agencies

“may recognize the desirability of good public relations, they generally make no conscious effort to reach out to the public through a well-planned effort.”⁹

A key factor in the success of communicating risk is the ability to connect the individual with the sense of personal vulnerability to the hazard. Absent a clear visual indication of how dam failure zones could impact residents, residents are aware of only a generalized, low probability risk – i.e. not one that is specific to where they live.

As stated in Section 5.3, dam failure inundation maps are not generally publicly available. FERC-regulated dams may severely restrict access citing security concerns. Internal USACE guidance states that “Commands may release non-editable (static) inundation map data to the public ... for public safety and welfare purposes.”¹⁰ However, there are restrictions on the types of modeling data that may be released – this information is often categorized For Official Use Only (FOUO).

The Association of State Floodplain Managers (ASFPM) recommends that:

“Communication of the residual risk associated with structures, including dams, levees, diversions, and reservoirs, should be an explicit component of all aspects of proposed and current structural projects. It should include notification to all property owners of the risk (e.g., a notice in an annual water bill or tax bill) and other steps such as posting signs in all land areas “protected” by structures stating clearly that the area is protected by structures that may fail or be overtopped, that the area is a floodplain, and with indications of the depth of flooding when the structure fails or is overtopped. Communication to the property owners should provide clear information on their role if an evacuation is ordered.”¹¹

Fearing liability, private dam owners and even government agency dam owners are not eager to communicate risk. While most homeowners learn of flood hazards associated with large runoff events via local floodplain management programs and the NFIP program, being located in a dam flood inundation zone does not trigger a requirement for participation in NFIP. Additionally, dam failure can be deeper, faster, more sudden and more extensive than floodplain areas mapped under the NFIP. Absent a risk being brought to their attention, most residents do not seek out this information.

Given the absence of perceived risk, public education materials for dam safety are not in high demand. Relative to other hazards/threats, there are also few materials available. National Dam Safety Day is May 31st – the anniversary of the historic 1889 Johnstown Flood.

⁹ FEMA/ASDSO, Model State Dam Safety Program, 2007. <http://damfailures.org/wp-content/uploads/2015/06/Model-State-Dam-Safety-Program.pdf>

¹⁰ USACE, Circular No. 1165-2-215, Use and Dissemination of Dam and Levee Inundation Map Data, July 2013.

¹¹ ASFPM, National Flood Policies and Programs in Review – 2007 as quoted in the FEMA Review and Evaluation of the National Dam Safety Program, 2011. <https://www.fema.gov/media-library-data/20130726-1830-25045-3217/damsafetyreport.pdf>

The NAS report provides potential approaches for shifting the current culture towards a more comprehensive community-based resiliency effort. Figure 16 below summarizes the suggested framework.

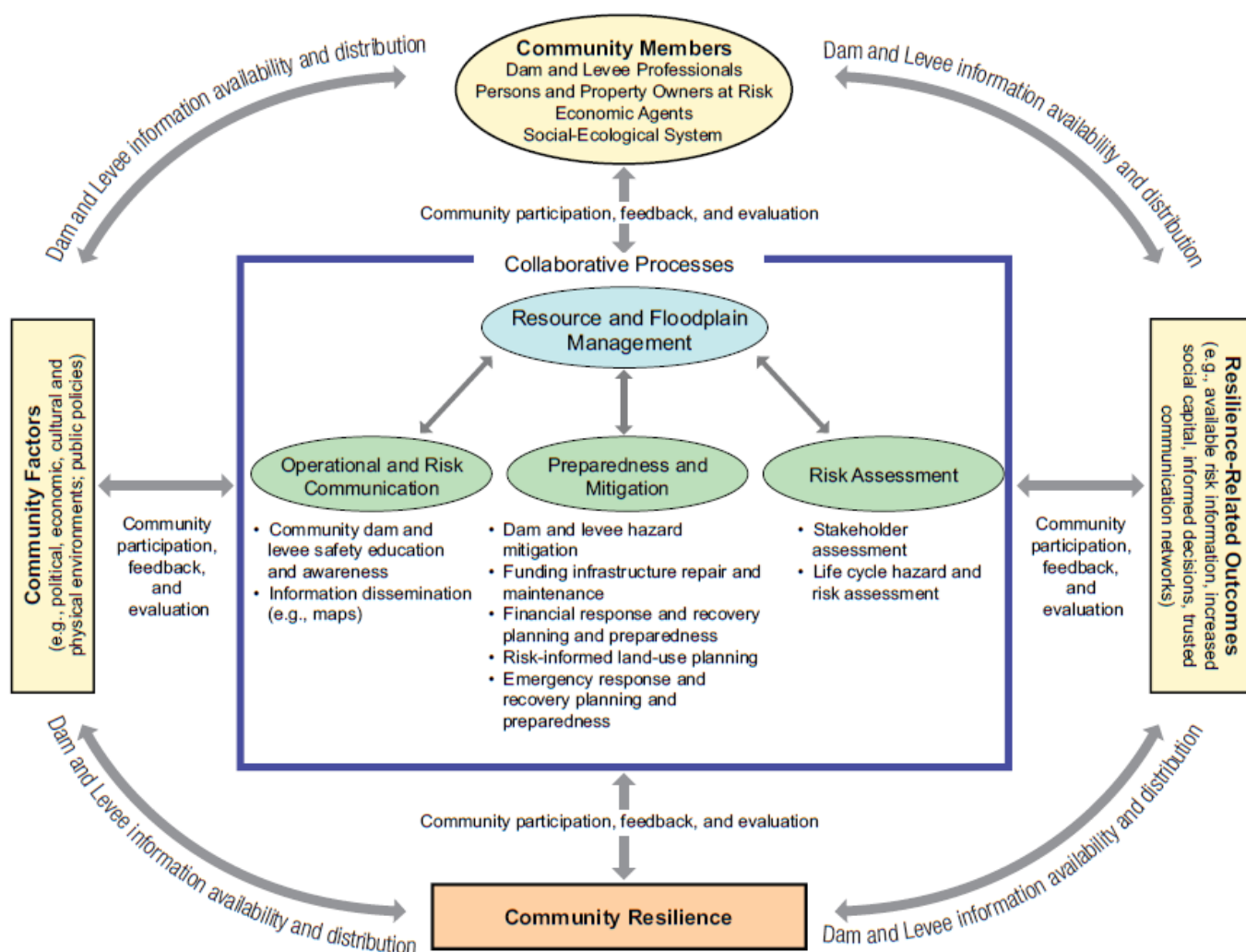


Figure 16. NAS Conceptual Framework for Resiliency-Focuses Collaboration Related to Dam and Levee Safety

The County's RHMP identifies Public Education as one of the selected County-wide Mitigation Actions (CW3). Specifically, "Continue to leverage/support/enhance ongoing, regional public education and awareness programs (such as "Take Winter by Storm" and "Make it Through") as a method to educate the public on risk, risk reduction and community resilience."

The Washington State CEMP states that local government is "Responsible for the public safety and welfare of the people in their jurisdiction, including whole community preparedness education..." The King County CEMP indicates that "Public education and personal preparedness are managed in a decentralized fashion by the cities of King County and within each King County Department. The 'whole community' concept is used. Efforts are made to reach the public with multiple media types, language formats, and culturally sensitive messages."

Table 10. Summary of Dam Safety Public Education Resources

Source	Title	Format	Consistency	Legitimacy	Scalability	Sustainability	Notes
King County OEM	Dam Failure	Bookmark handout	H	H	L	M	Infrequently requested/distributed
Seattle Public Utilities	Dam Safety Information for Tolt Reservoir	Website and PDF brochure	H	H	H	H	More info than Youngs Res; includes sirens and evacuation route map
Seattle Public Utilities	Dam Safety Information for Lake Youngs Reservoir	Website	H	H	H	H	
Washington Dept. of Ecology	Department	Website	H	H	H	H	No dam safety public ed material. Dam Owner Guidelines, inspections
Washington Dept. of Emergency Management	Department	Website	H	H	H	H	No dam safety-specific public education material
FEMA	Living with Dams: Know Your Risks	Online PDF	H	H	H	H	Consistent with ASDSO document
FEMA	Fact Sheet: Be Aware of Dam Failure in Your Community	Online PDF	H	H	H	H	2-page flyer, 2016
FEMA	Dam Safety	Website	M	H	M	M	National Dam Safety Program; National Dam Safety Awareness Day
FEMA	Training Aids for Dam Safety (TADS)	Self-instruction – DVD order	H	H	L	L	21 modules for engineers, technicians, dam owners, safety program managers, and the public, 2009
FEMA	Dam Sector: Crisis Management Overview Course	Online Course (IS-870)	H	H	H	H	Intended for public safety/emergency managers
FEMA	Community Dam Safety, Preparedness and Mitigation	Resident Course (E0291)	H	H	L	L	Resident 4-day course in Emmitsburg, MD. Offered infrequently

Table 10. Summary of Dam Safety Public Education Resources (cont.)

Source	Title	Format	Consistency	Legitimacy	Scalability	Sustainability	Notes
Dam Safety Action	Organization	Website	M	M	L	L	Advocates for development of EAPs
ASDSO	Living with Dams: Know Your Risk	eBook	H	H	H	H	Consistent with FEMA document, advice on approximating inundation zones may not be applicable to King County with its highly varied topography

Qualitative Evaluations for Consistency/Legitimacy/Scalability/Sustainability: H=High, M=Medium, L=Low

6. SUMMARY AND RECOMMENDATIONS

A summary of the completed reviews of the Emergency Action Plans, Evacuation Plans, Sheltering and Care Plans, and Public Education related to potential dam emergencies is presented in this section. Recommended actions to address the gaps identified in the reviews are described along with estimated costs to implement the recommendations.

6.1. Gap Analysis Review Summary

A summary for each of the gap analysis reviews performed are detailed below.

6.1.1. Summary of EAP Reviews

After performing a gap analysis on the available emergency action plans (EAPs) for 82 dams in and around King County, several consistent gaps are apparent that could affect a dam facility owner's readiness and ability to respond to a dam failure emergency. The most immediate gaps are listed below:

1. Many EAPs are out-of-date:

To respond effectively in a potential emergency situation, information in a dam's EAP needs to be current. The EDSO Guidelines recognize this and have specific requirements for reviewing and updating the EAP (EDSO 2013):

"The EAP should be reviewed and updated annually, including:

- *Calling all contacts on the notification charts in the EAP to verify that names and phone numbers are current.*
- *Contacting the Local Emergency Management Agency to verify where the EAP is kept and if responsibilities as described in the EAP are understood.*
- *Calling the locally available resources to verify the phone numbers, addresses, and services are current.*
- *Reviewing information on the people and structures at risk and incorporate changes in development within the flood inundation area."*

Only 18 of the dam EAPs reviewed have been updated within the last year, and over half of the dam (46) EAPs reviewed have not been revised in the last 5 years including the 13 dams classified as Hazard Class 1A or 1B listed in Table 11. The administrative and procedural information within the EAPs should be reviewed annually and kept up-to-date in order for it to be effective during an emergency.

During the process of contacting dam owners for EAPs that were not on file with the EDSO, the City of Bellevue provided an EAP for the Lakemont Detention Pond (formerly known as the High Park Detention Pond). The City stated that the EAP was outdated but that based on the inquiry, they would be developing an update to the EAP including reviewing the contact information for any revisions that should occur. The City also stated they would be checking to see if any of their other facilities might be classified as dams (Per. Com. Lane 6/30/2017).

For efficiency of review, the dam EAPs were obtained from three sources in the following order: KCWLRD, EDSO, and by contacting the dam owners directly. It is possible that if the versions of the EAPs that KCWLRD or EDSO have on file are not the most recent versions, the gaps for these EAPs may be overstated (Per Com. Lattimore 8/8/2017). However, the EDSO Guidelines also state that “*The local emergency manager should take part in the annual review, and all updates should be promptly distributed to all plan holders*” (EDSO 2013), and therefore if EAP holders do not have the most recent updates to the EAP this would also constitute a gap that should be rectified.

Table 11. Hazard Class 1A & 1B Dams w/ No EAP Update in more than 5 years

Dam Name	Owner	Hazard Class	EAP Date Created/ Previous	EAP Date Revised	Max Storage (ac-ft)	Dam Height (ft)
Green Lake (Roosevelt) Reservoir	Seattle Public Utilities	1A	3/2011	N/A	181	25
Issaquah Highlands WSDOT Detention Pond Dam	City of Issaquah	1A	10/2009	N/A	53	22
Panther Lake Detention Dam	Federal Way National Little League	1B	5/2000	9/2007	339	12
Lake Forest Park Reservoir	Seattle Public Utilities	1B	3/2011	N/A	208	40
Panther Lake Ballfield Dam	Federal Way National Little League	1B	5/2000	9/2007	102	15
Bitter Lake Reservoir	Seattle Public Utilities	1B	3/2011	N/A	71	31
Issaquah Highlands Upper Reid Detention Pond Dam	City of Issaquah	1B	10/2009	N/A	69	38
Volunteer Park Reservoir	Seattle Public Utilities	1B	3/2011	N/A	69	42
Microsoft Issaquah Highlands SW Pond	Microsoft Corporation	1B	4/15/2008	7/8/2009	43	20
Cedar Way Stormwater Detention Dam	City of Mountlake Terrace	1B	1/2010	N/A	40	30
High Point Stormwater Pond	City of Bellevue	1B	12/31/1997	6/2001	30	13
Panther Lk. First Ave. Detention Pond	Federal Way National Little League	1B	5/2000	9/2007	18	9

Table 11. Hazard Class 1A & 1B Dams w/ No EAP Update in more than 5-years (cont.)

Dam Name	Owner	Hazard Class	EAP Date Created/ Previous	EAP Date Revised	Max Storage (ac-ft)	Dam Height (ft)
Newcastle Stormwater Pond 3 Dam	City of Newcastle	1B	8/2006	N/A	13	12

2. Lack of Tabletop or Functional Exercises, Training/Orientations:

The EDSO Guidelines specify that high hazard dams should conduct tabletop and functional exercises, with specific reference to their frequency as follows: “*As tabletop and functional exercises are typically complex they should be conducted about every five years, or when a significant change has taken place to the dam or surround area*” (EDSO 2013).

Only three of the 60 high hazard dams (Hazard Class 1A, 1B, and 1C) with reviewed EAPs had any record of a tabletop or functional exercise that had been conducted, with two other significant hazard dams (Hazard Class 2) included as part of the tabletop exercises conducted for the South Fork Tolt River Project. Of these exercises, only the South Fork Tolt River Project has conducted them within the last five years. The South Fork Tolt River Project is also the only EAP that contains documented information regarding annual training or orientations.

Table 12 lists the five dams with Tabletop Exercise information located during the EAP review process.

Table 12. Tabletop/Functional Exercises in Reviewed EAPs

Dam Name	Owner	Hazard Class	Date of Last Tabletop /Functional Exercise?	Max Storage (ac-ft)	Dam Height (ft)
Culmback Dam	Snohomish PUD	1A	6/23/2010	200,000	270
Masonry Dam (Cedar Falls Project)	Seattle City Light / Seattle Public Utilities	1A	5/11/2011	175,000	225
Tolt River Dam (South Fork Tolt River Project)	Seattle Public Utilities / Seattle City Light	1A	9/24/2016	67,200	213
Tolt River Regulated Basin South Dam (South Fork Tolt River Project)	Seattle Public Utilities / Seattle City Light	2	9/24/2016	1,100	60
Tolt River Regulated Basin West Dam (South Fork Tolt River Project)	Seattle Public Utilities / Seattle City Light	2	9/24/2016	1,100	43

3. Inundation Mapping Possibly Out-of-Date:

While the EDSO Guidelines state that the EAP should be reviewed and updated annually, and that the information on people and structures at risk should be reviewed along with the incorporation of any changes in development within the inundated flood area, there are no specific guidelines defining how often the inundation mapping should be revised or how often the modeling data used to create the inundation mapping should be updated. In identifying best practices for this crucial component of an EAP, the Federal Energy Regulatory Commission (FERC) EAP guidelines were consulted which state:

“If there are significant changes to downstream development (e.g. new streets, bridges, subdivisions) that are not shown on the inundation maps and more-current base map information is available, the inundation maps should be updated. At a minimum, maps should be updated and reprinted during the EAP reprint cycle every five years” (FERC 2015).

Up-to-date inundation maps are critical to emergency response efforts by KCOEM as the mapping is used to identify the structures and roads that would be inundated by flood waters under different types of dam failure scenarios. These maps must be updated with any new structures and developments downstream of the dam that would be affected by flood waters from a dam failure event in order for local emergency managers to know which areas should be evacuated and how long it will take for the floodwaters reach those areas.

Sixty of the 82 dams with reviewed EAPs have not had their inundation mapping created or updated in the last five years. In addition, six of the nine Hazard Class 1A dams with reviewed EAPs have not had their inundation mapping updated in the last five years (see Table A-5 in Appendix A).

6.1.2. Summary of Evacuation Plan Reviews

1. Dam failure is a notable but underappreciated hazard.

Dam failure represents a hazard that could require the evacuation of up to 25,000 County residents. Like most jurisdictions in the United States, residents and local agencies are not aware of the number of potential sources of dam failure and the areas that could be impacted during an incident. Timely evacuation from areas at risk would be impacted by the lack of understanding regarding the potential severity and speed with which an incident could impact a community.

2. Evacuation plans are in place but not validated.

King County has developed most required and recommended evacuation plans and procedures. However the County lacks recent large-scale evacuation experience and has not exercised the Evacuation Incident Annex with county stakeholders.

3. Evacuation is dependent on a potentially vulnerable warning system.

Successful evacuation of those at risk is dependent on the timely and accurate dissemination of warning information. The County’s current use of the KCOEM Duty Officer generally provides sufficient capabilities for most hazards. However, should the Duty Officer be unavailable, out of contact, suffer communications failure, or be

committed to another emergency operation, dam failure evacuation warnings could be delayed.

6.1.3. Summary of Mass Care & Shelter Plan Reviews

1. Mass Care is more than sheltering.

In each planning document, the congregate sheltering function is the most developed. Mass feeding, distribution of supplies, and family reunification are not addressed at the same level of detail. There may also be an over-reliance on the American Red Cross for many functions.

2. Mass Care & Shelter plans are in place but not validated.

King County is substantially prepared and has the large majority of concepts, policies, authorities and tools in place to accomplish the mass care and shelter mission in response to an actual or potential dam failure event. However, ESF-6 Annex has not been validated via exercises or utilized in an actual incident.

3. Mass Care & Shelter capabilities are not fully defined.

County and stakeholder jurisdictions and agencies do not have a comprehensive inventory of mass care & shelter capabilities including shelter staff, shelter equipment, mass feeding/hydration services, animal services and materials that would support individuals with Access and Functional Needs. An assessment of what may be needed versus what is available would identify any potential gaps relative to a dam failure incident.

6.2. Recommendations

Below are the prioritized recommendations based on the reviews of the available Emergency Action Plans, Evacuation Plans, Mass Care and Sheltering Plans, and Public Education Efforts.

6.2.1. EAP Recommendations

Recommendations developed from the review of available EAPs were prioritized as High, Medium, and Low based on their potential to improve the dam owner's readiness in the event of an unusual or emergency situation. In some cases, the dam Hazard Classifications were used to prioritize the recommendations so that dams with greater potential for loss of life were given higher priority. Approximate cost estimates for the dam owner carrying out the recommendations are included for each recommendation and are separated out by dam size defined by maximum storage area behind the dam as detailed in Section 2.4 and displayed in Table 13. The cost estimates are generic and intended to provide a general idea of the order of magnitude associated with the recommendations.

Table 13. Dam Sizes for Cost Estimating

Dam Size	Max Storage (ac-ft)
Small Storage	0 - 50
Medium Storage	50 – 10,000

Table 13. Dam Sizes for Cost Estimating (cont.)

Dam Size	Max Storage (ac-ft)
Large Storage	10,000 – 50,000
Very Large Storage	50,000+

HIGH Priority

1. ***EAP Text Revision and Updating (All Hazard Classes)***: Each of the 64 EAPs that has not been revised within the last year should be reviewed and updated as described in the EDSO Guidelines (see Section 6.1.1). The verification of contact information in particular should be conducted immediately as effective communication during an emergency event between dam representatives, emergency management officials, and local law enforcement is of critical importance to the protection of any lives, critical infrastructure, and properties downstream of the dam. Revision lists should be updated for each EAP as well so all future EAP reviews and revisions can be cataloged within the EAP itself. Copies of the updated EAPs should then be kept on file at both the EDSO and with KCOEM (See Table A-3 in Appendix A for a complete list of dam EAPs recommended for revision and updating).

A preliminary cost estimate to dam owners for these revisions and updates based on the dam size classifications detailed in Table 14.

Table 14. Cost Estimate for Revising and Updating Text in EAPs Not Revised within the Last Year

Dam Size	Number of Dams	EAP Text Update Costs		Dam Size Total Costs
		Administrative	Procedural	
Small Storage	31	\$1,000	\$200	\$37,200
Medium Storage	29	\$1,500	\$300	\$52,200
Very Large Storage	4	\$4,000	\$500	\$18,000
Total Costs:				\$107,400

2. ***King County Active Assistance in Monitoring EAP Compliance (All Hazard Classes)***: Though it is not a responsibility assigned to KCOEM in the EDSO Guidelines, in order to ensure it can respond effectively in a potential dam emergency, the King County Dam Safety Officer (KCDSO) should take an active role in monitoring when EAPs are updated and periodic inspections are performed by the EDSO for all dams that have the potential to affect King County. This will help maintain King County emergency officials' awareness of the steps dam owners are taking to respond to a dam failure emergency. The KCDSO should also be active in coordinating with EDSO on obtaining updated EAPs from dam owners for dams that have the potential to affect King County lives and property and keeping them on file at KCOEM per EDSO Guidelines.

After discussions with KCOEM, no cost estimate is provided for this recommendation as it falls within the scope of the regular job duties for the King County Dam Safety Officer (Per Com. Dow 7/31/2017).

3. ***Inundation Mapping Gaps (Hazard Classes 1B, 1C, 2):*** Per the EDSO Guidelines, inundation mapping should be developed for the 12 dams listed in Table 15 that did not have any included in their EAP. Mapping products should follow the EDSO Guidelines for development of inundation maps. A cost estimate for dam owners to create inundation mapping for the dams listed in Table 15 is located in Table 16 (See Table A-4 in Appendix A for a complete list of dam EAPs with Inundation Mapping Gaps).

Table 15. Dams without Inundation Mapping in Reviewed EAPs

Dam Name	Owner	Hazard Class	Max Storage (ac-ft)	Dam Height (ft)
Lakemont Detention Pond (High Park Detention Pond)	City of Bellevue	1B	30	13
Johnson Pond Dam	King County WLRD	1B	25	15
Youngs Lake New Inlet Dam	Seattle Public Utilities	1C	16,838	25
Port of Seattle, Industrial Wastewater Lagoon #3	Port of Seattle	1C	256	31.5
South 336th St. Stormwater Det. Pond	Federal Way National Little League	1C	49	19
Kitts Corner Detention Pond	Federal Way National Little League	1C	46	12
Mill Pond Dam	City of Auburn	1C	16	10
Youngs Lake Cascades Dam	Seattle Public Utilities	2	12,320	16
Newcastle Railroad Embankment Dam	Seattle City Light	2	200	60
Des Moines Creek Reg Det Pond West Berm	Des Moines Creek Basin Committee	2	160	14
Des Moines Creek Reg Det Facility East Berm	Des Moines Creek Basin Committee	2	31	14
Des Moines Creek Stormwater Detention	Port of Seattle	2	23	18

Table 16. Cost Estimate to Create Inundation Mapping for Dams in Table 13

Dam Size	Number of Dams	Inundation Mapping Creation Costs	Dam Size Total Cost
Small Storage	7	\$30,000	\$210,000
Medium Storage	3	\$75,000	\$225,000
Large Storage	2	\$150,000	\$300,000
Total Cost:			\$735,000

4. ***Review Older Inundation Mapping (Hazard Class 1A):*** The EDSO Guidelines do not specify how often the inundation mapping within each EAP should be reviewed and updated, but FERC requires that the maps for their dams to be updated and reprinted at a

minimum of every 5 years (FERC 2015). In order to follow the best standards currently available, inundation mapping that has not been updated in over 5 years for all high hazard dams of Hazard Class 1A should receive a thorough review to determine if major downstream developments or critical infrastructure improvements would significantly change the inundation extents or the population and structures at risk from the current mapping products. Table 17 contains a list of the Hazard Class 1A dams that have inundation mapping that has not been updated in the last 5 years (See Table A-5 in Appendix A for a list of dams with inundation mapping recommended for review). It should be noted that updating of the EAP inundation mapping often does not involve updating the dam breach and associated downstream routing of the dam break flood. The dam break analysis need only be updated when there are changes that would significantly affect the analysis such as updated hydrology, modifications to the dam, changes in dam operation, or major changes in downstream conditions that would impact the passage of the dam break flood wave. Updating of the base mapping on which the inundation zone is displayed can be a relatively minor effort. Table 18 contains a cost estimate for dam owners to review the inundation mapping for the dams listed in Table 17.

Table 17. Hazard Class 1A Dams w/ Inundation Mapping Updated >5 years ago

Dam Name	Owner	Hazard Class	Max Storage (ac-ft)	Dam Height (ft)	Date of Inundation Mapping
Masonry Dam (Cedar Falls Project)	Seattle City Light/Seattle Public Utilities	1A	175,000	225	7/1996
Mud Mountain Dam	USACE	1A	156,000	425	6/2010
Youngs Lake Outlet Dam	Seattle Public Utilities	1A	18,908	30	7/2011
Green Lake (Roosevelt) Reservoir	Seattle Public Utilities	1A	181	25	12/1992
Issaquah Highlands WSDOT Detention Pond Dam	City of Issaquah	1A	53	22	12/2006
Madsen Creek West Basin Dam	King County WLRD Stormwater Services Section	1A	27	6.5	02/2005

Table 18. Cost Estimate for Reviewing Inundation Mapping for Dams in Table 17

Dam Size	Number of Dams	Inundation Mapping Review Costs	Dam Size Total Cost
Small Storage	1	\$2,000	\$2,000
Medium Storage	2	\$3,500	\$7,000
Large Storage	1	\$5,000	\$5,000
Very Large Storage	2	\$10,000	\$20,000
Total Cost:			\$34,000

5. **Conduct Tabletop Exercises (Hazard Classes 1A, 1B, 1C):** According to the EDSO Guidelines detailed in Section 6.1.1, all high hazard dams (Hazard Classes 1A, 1B, and 1C) should conduct tabletop exercises every 5 years or after any significant changes have occurred to the dam or surrounding area. 56 of the high hazard dams with EAPs reviewed for this report have not conducted tabletop exercises within the last 5 years. A detailed report that identifies the exercises, participants, dates of the exercises, and includes recommendations for updates to the existing EAP that should be completed in order to improve readiness to properly respond to an emergency event. The summary report should be included in all future copies of the EAP (See Table A-6 in Appendix A for a complete list of dams that are recommended to conduct tabletop exercises).

A cost estimate for dam owners to conduct tabletop exercises for the dams listed in Appendix A Table A-6 is located in Table 19:

A recommended addition to these costs is for KCOEM to provide technical support for tabletop exercises and training for their EAPs through a coordinator on the KCOEM staff. A preliminary cost estimate provided by KCOEM officials for this effort for the 56 dams in Table 19 is shown in Table 20, with an estimated time of 75 months to complete the work for one part-time coordinator.

Table 19. Cost Estimate for Conducting Tabletop Exercises

Dam Size	Number of Dams	Number of People Involved	Estimated Tabletop Exercise Costs			Total Estimated Tabletop Exercise Costs
			Average Cost Per Person	Exercise Development	After-Action Report	
Small Storage	23	2	\$1,000	\$500	\$500	\$69,000
Medium Storage	24	3	\$1,000	\$750	\$750	\$108,000
Large Storage	6	5	\$1,000	\$1,250	\$1,250	\$45,000
Very Large Storage	3	10	\$1,000	\$2,500	\$2,500	\$45,000
Total Costs:						\$267,000

Table 20. Cost Estimate for KCOEM to Assist Dam Owners with Tabletop Exercises for Dams in Table 19

Total Number of Dams	KCOEM Assistance Cost Per Dam	Total KCOEM Assistance Costs
56	\$2,500	\$140,000
Total Costs:		\$140,000

MEDIUM Priority

6. **Inundation Mapping Gaps (Hazard Class 1A):** The reviewed copy of the EAP for Howard Hanson dam has inundation mapping that is difficult to decipher with many of the colors appearing washed out and blending with each other, making the inundation areas difficult to discern and roads and other critical infrastructure difficult to locate. It is possible that only the copy of the EAP that was reviewed has these issues, but all other

EAPs for Howard Hanson that have been distributed should have their mapping products reviewed to determine how widespread the readability problems are with the mapping products.

Total Estimated Cost: \$1,000-\$5,000

7. **Conduct Annual Training/Orientations (Hazard Classes 1A, 1B, 1C, 2):** Training and orientations should be conducted at all dams per the EDSO Guidelines). As detailed in Section 2.3.2.7, more than half of the EAPs contained no documentation of training or orientations that had been conducted with dam sizes ranging from Small Storage to Very Large Storage. The EDSO Guidelines) state that periodic training is necessary to make sure that everyone involved with the EAP is familiar with every element of it.

Total Estimated Costs: \$250 (Small Dams) -\$2,000 (Very Large Dams)

8. **Review Older Inundation Mapping (Hazard Classes 1B, 1C):** Inundation mapping has not been updated in over 5 years for 36 high hazard dams of Hazard Classes 1B and 1C with dam sizes ranging from Small Storage to Medium Storage. The inundation mapping for each of these dams should receive a thorough review to determine if any major downstream developments or critical infrastructure improvements would significantly change the inundation extents for the current mapping products (See Appendix A Table A-5 for a complete list of dams that have inundation mapping recommended for thorough review).

Total Estimated Costs: \$2,000 (Small Dams) - \$3,500 (Medium Dams)

LOW Priority

9. **Inundation Mapping Gaps (Hazard Class 1B, 1C, 2):** There are 20 high hazard dams (Hazard Classes 1B and 1C) and 3 significant hazard dams (Hazard Class 2) with dam sizes ranging from Small Storage to Medium Storage that have gaps identified in their inundation mapping as part of the review process and need to be updated to follow EDSO Guidelines (See Table A-4 in Appendix A for a complete list of dams that have inundation mapping gaps).

Total Estimated Costs: \$30,000 (Small Dams) – \$75,000 (Medium Dams)

10. **Review Older Inundation Mapping (Hazard Class 2):** Inundation mapping has not been updated in over 5 years for 7 significant hazard (Hazard Class 2) dams with dam sizes ranging from Small Storage to Medium Storage. The inundation mapping for each dam EAP should receive a thorough review to determine if any major downstream developments or critical infrastructure improvements would significantly change the inundation extents for the current mapping products (See Appendix A Table A-5 for a complete list of dams that have inundation mapping recommended for through and in-depth review).

Total Estimated Costs: \$2,000 (Small Dams) - \$3,500 (Medium Dams)

11. **Conduct Tabletop Exercises (Hazard Class 2):** Twenty-one significant hazard dams of Hazard Class 2 with dam sizes ranging from Small Storage to Large Storage have not been included in any previous tabletop exercises and should conduct an exercise that involves all relevant dam staff and emergency services personnel. Hazard Class 2 dams are not required according to the EDSO Guidelines, but the exercises do provide an

extremely valuable opportunity to assess the effectiveness of the EAP in a simulated emergency event and locate any deficiencies that might lead to problems during a real dam failure scenario. A detailed report that summarizes the exercises and includes recommendations for updates to the existing EAP should be completed in order to improve readiness to an emergency event. The summary report should be included in all future copies of the EAP (See Appendix A Table A-6 for a complete list of dams recommended to conduct tabletop exercises).

Total Estimated Costs: \$3,000 (Small Dams) - \$15,000 (Large Dams)

6.2.2. Evacuation Plan Recommendations

HIGH Priority

1. ***Inundation Mapping in CodeRed:*** Pre-load the EAP inundation maps into the KCOEM CodeRed automated warning system. Consider developing pre-scripted warning and evacuation messages specific to each dam including details on how much time is available to evacuate, how to evacuate (routes, vertically, etc.), evacuee reception centers, and sources of additional information.

A cost estimate for this effort is provided in Table 21. Ongoing, annual costs to maintain and validate pre-loaded warning areas and scripts in the CodeRed system and train staff are estimated to be 50% of initial costs or \$6,280.

Table 21. Cost Estimate for Incorporating EAP inundation maps into CodeRed system

Task	Staff	Hours	Estimated Cost¹²
Import GIS inundation maps into CodeRed	EM Program Manager	12	\$ 875
	EM Program Coordinator	40	\$2,589
Validate/test pre-loaded warning areas	EM Program Manager	8	\$ 583
	EM Program Coordinator	20	\$1,295
Develop dam-specific warning message scripts	EM Program Manager	12	\$ 875
	EM Program Coordinator	40	\$2,589
Coordinate maps and scripts with potentially impacted jurisdictions	EM Program Manager	16	\$1,166
	EM Program Coordinator	40	\$2,589
Total Estimated Cost:			\$12,560

2. ***Alternate Notification Method:*** Develop an alternate method for a dam owner notification to result in public warning should the KCOEM Duty Officer fail to receive the notification.

¹² Assumes Step 7 for each staff position and an hourly rate benefit overhead factor of 56%.

Table 22. Cost Estimate for developing alternate method and tools for conducting public warning

Task	Staff	Hours	Estimated Cost ¹³
Identify potential alternate warning methods	EM Program Manager	4	\$ 291
	EM Program Coordinator	8	\$ 518
Develop/revise warning procedures/tools	EM Program Manager	4	\$ 291
	EM Program Coordinator	12	\$ 776
Coordinate alternate warning methods with EAPs and stakeholders	EM Program Manager	8	\$ 583
	EM Program Coordinator	40	\$2,589
Total Estimated Cost:			\$5,048

3. ***Incorporate AFN Requirements/ Best Practices:*** Consider broad incorporation of AFN requirements and suggested best practices in each warning and evacuation element/service area. Evaluate potential for adopting procedures and tools from other jurisdictions. Review should be conducted in coordination with, and with input from, people within AFN communities.

Table 23. Cost Estimate for incorporating AFN requirements/best practices

Task	Staff	Hours	Estimated Cost ¹⁴
Research and identify AFN requirements and best practices for warning and evacuation	EM Program Manager	4	\$ 291
	EM Program Coordinator	40	\$2,589
Develop/revise plans and procedures	EM Program Manager	20	\$1,458
	EM Program Coordinator	40	\$2,589
Coordinate with AFN communities	EM Program Manager	8	\$ 583
	EM Program Coordinator	40	\$2,589
Total Estimated Cost:			\$10,100

MEDIUM Priority

4. ***Incorporate Threat Summaries:*** Consider incorporating quantified dam failure threat summaries into the County's CEMP and consider including dam inundation maps to provide visual indicator of potential effects.
5. ***Conduct Evacuation Capabilities Assessment:*** Consider conducting a formal Evacuation Capabilities Assessment to identify and quantify capabilities as well as potential resource shortfalls. Assess status of related Memoranda of Understanding (MOUs) and contracts.

¹³ Assumes Step 7 for each staff position and an hourly rate benefit overhead factor of 56%.

¹⁴ Assumes Step 7 for each staff position and an hourly rate benefit overhead factor of 56%.

Table 24. Cost Estimate for conducting Evacuation Capabilities Assessment and assessing MOUs

Task	Staff	Hours	Estimated Cost¹⁵
Identify/Develop Evacuation Capabilities Tool	EM Program Manager	4	\$ 291
	EM Program Coordinator	8	\$ 518
Identify evacuation resources	EM Program Manager	4	\$ 291
	EM Program Coordinator	24	\$1,554
Coordinate with affected jurisdictions/stakeholders	EM Program Manager	4	\$ 291
	EM Program Coordinator	16	\$1,035
Identity/Assess supporting MOUs	EM Program Manager	4	\$ 291
	EM Program Coordinator	8	\$ 518
Total Estimated Cost:			\$4,789

6. **Revise Mass Evacuation Incident Annex:** Consider revising the Mass Evacuation Incident Annex to incorporate the following elements:
- Organize the Concept of Operations section by Evacuation Phase.
 - Consider the question of mandatory vs. voluntary evacuation and incorporate into policy section. If needed, delineate authorities to order and enforce mandatory evacuations.
 - Clarify the role of RCECC and communications methods (ex. RCECC and ICPs and Evacuation Sites). Consider diagramming potential agency/organization relationships. Consider identifying RCECC position(s) responsible for this function and add to position checklists.
 - Address the need to identify and communicate target destinations to evacuees in order to align evacuation flows with traffic controls and to prepare evacuation reception centers or shelters.
 - Incorporate additional guidance regarding procedures and tools for addressing needs of children and others requiring caregivers or other assistance during an evacuation.
 - Consider participation in the National Mass Evacuation Tracking System.
 - Incorporate additional guidance regarding animal evacuation procedures and tools (ex. certain animals are allowed on public transportation if contained).
 - Consider identifying a specific agency coordinator and authority empowered to make decision to re-enter. Identify re-entry options and potential control measures (ex. residents only w/ ID)
 - Add a list of potential Essential Elements of Information (EEIs) to guide information collection.
 - Expand glossary to support a broader audience.

Contractor costs to revise a Mass Evacuation Annex range from \$25,000 to \$45,000.

¹⁵ Assumes Step 7 for each staff position and an hourly rate benefit overhead factor of 56%.

Table 25. Cost Estimate for revising the Mass Evacuation Incident Annex

Task	Staff	Hours	Estimated Cost ¹⁶
Identify gaps/required changes/references	EM Program Manager	16	\$1,166
	EM Program Coordinator	4	\$ 258
Coordinate with affected jurisdictions/stakeholders	EM Program Manager	16	\$1,166
	EM Program Coordinator	32	\$2,070
Develop draft revision and circulate for comment	EM Program Manager	16	\$1,166
	EM Program Coordinator	72	\$4,661
Finalize Annex and distribute/socialize	EM Program Manager	16	\$1,166
	EM Program Coordinator	40	\$2,589
Total Estimated Cost:			\$14,242

7. ***Incorporate Evacuation Function:*** Incorporate the Evacuation function into future county-wide or regional exercises.
8. ***Identify/Evaluate Evacuation Routes/Times:*** Identify and evaluate potential evacuation routes and model estimated vehicle evacuation times. Consider using the Virginia Real time evacuation Planning Model (RtePM)¹⁷ to evaluate vehicle traffic flow and alternate routes/destinations.
9. ***Identify/Evaluate Evacuation Centers:*** Identify and evaluate potential evacuation centers in coordination with stakeholder organizations/agencies. Enter and maintain evacuation center data in the National Shelter System (NSS).

6.2.3. Mass Care and Sheltering Plan Recommendations

HIGH Priority

1. ***Determine Care/Shelter Mission Requirements:*** Using estimates from the Level 2 Hazus analysis of potential worst-case scenario impacts, determine the potential care and shelter mission requirements.

¹⁶ Assumes Step 7 for each staff position and an hourly rate benefit overhead factor of 56%.

¹⁷ Virginia real time evacuation Planning Model (RtePM), <http://rtepm.vmasc.odu.edu/>

Table 26. Cost Estimate for determining care & shelter requirements

Task	Staff	Hours	Estimated Cost ¹⁸
Forecast general population shelter demand and locations	EM Program Manager	4	\$ 291
	EM Program Coordinator	8	\$ 518
Forecast mass feeding/hydration demand	EM Program Manager	4	\$ 291
	EM Program Coordinator	8	\$ 518
Forecast pet/livestock shelter demand and locations	EM Program Manager	4	\$ 291
	EM Program Coordinator	8	\$ 518
Develop target capabilities report	EM Program Manager	4	\$ 291
	EM Program Coordinator	4	\$ 259
Total Estimated Cost:			\$2,977

2. **Conduct Formal Shelter Needs Assessment:** A formal Shelter Needs Assessment to identify and quantify capabilities as well as potential resource shortfalls using a process such as the San Francisco Urban Area Security Initiative Local Government Care and Shelter Gap Identification Tool should be conducted. Assess status of related MOUs/contracts.

Table 27. Cost Estimate for conducting Shelter Needs Assessment and assessing MOUs

Task	Staff	Hours	Estimated Cost ¹⁹
Identify available Shelter Needs Capabilities Tool	EM Program Manager	4	\$ 291
	EM Program Coordinator	4	\$ 259
Coordinate with affected jurisdictions/stakeholders	EM Program Manager	4	\$ 291
	EM Program Coordinator	16	\$1,035
Conduct Assessment / Develop Findings	EM Program Manager	4	\$ 291
	EM Program Coordinator	20	\$1,295
Assess MOUs and identify gaps	EM Program Manager	4	\$ 291
	EM Program Coordinator	4	\$ 259
Total Estimated Cost:			\$4,012

3. **Incorporate AFN Requirements/Best Practices:** Consider broad incorporation of AFN requirements and suggested best practices in each element and service area within ESF 6. Evaluate potential for adopting procedures and tools from other jurisdictions. Review should be conducted in coordination with, and with input from people within AFN communities.

¹⁸ Assumes Step 7 for each staff position and an hourly rate benefit overhead factor of 56%.

¹⁹ Assumes Step 7 for each staff position and an hourly rate benefit overhead factor of 56%.

Table 28. Cost Estimate for addressing AFN requirements and best practices

Task	Staff	Hours	Estimated Cost ²⁰
Identify requirements best practices	EM Program Manager	40	\$2,915
	EM Program Coordinator	60	\$3,884
Coordinate with jurisdictions, stakeholders, and AFN groups	EM Program Manager	16	
	EM Program Coordinator	32	\$1,166 \$2,071
Revise ESF-6 Annex, associated procedures/tools	EM Program Manager	30	\$2,186
	EM Program Coordinator	60	\$3,884
Conduct stakeholder awareness training	EM Program Manager	24	\$1,749
	EM Program Coordinator	24	\$1,553
Total Estimated Cost:			\$19,048

4. **Exercise/Evaluate Region Shelter Operations Annex:** Consider exercising the Regional Shelter Operations Annex and evaluate the capabilities for non-impacted jurisdictions to host evacuees. Evaluate the capability to sequence the opening of shelters to align with public information and traffic control in order to direct the movement of evacuees to shelters that have capacity.

Contractor costs to develop and administer a county-wide tabletop exercise range from \$25,000 to \$45,000. Contractor costs to develop and administer a county-wide functional exercise range from \$35,000 to \$65,000.

MEDIUM Priority

5. **Revise ESF-6 Annex:** Consider revising the ESF-6 Annex to incorporate the following elements:
- Align document scope and organization with State ESF#6 – expand on Emergency Assistance and Human Services sections. Ensure the referenced Post-Disaster Housing Plan is complete. Clarify relationship of ESF 6 Annex, Mass Care Annex, and Regional Shelter Operations Annex. See "Defining the Scope of Mass Care and Shelter" below.
 - Revise "Purpose" statement to address intent of the ESF 6 Annex and add roles currently in "Scope" section.
 - Revise "Situation" section to define ESF 6 functions as per the CEMP.
 - Expand Mass Feeding element to provide scope and operational detail similar to shelter or C-POD operations.
 - Add role for legal counsel to address issues such as determination of fiscal liability for actual or potential dam failure response.

²⁰ Assumes Step 7 for each staff position and an hourly rate benefit overhead factor of 56%.

- f. Evaluate the potential for integrating volunteer organization resources into ESF 6 function.
- g. Clarify use of “Post-Disaster” in ESF 6 Annex and Regional Shelter Operations Annex.
- h. Summarize relevant specific legal requirements for multiple specific groups (ex. victims of domestic abuse).
- i. Incorporate additional guidance regarding procedures and tools for addressing needs of children.
- j. Assign responsibility for injured/missing notifications to a County department.
- k. Add a list of potential Essential Elements of Information (EEIs) to guide information management.
- l. Expand glossary to support a larger audience.

Contractor costs to revise an ESF-6 Annex range from \$25,000 to \$45,000

Table 29. Cost Estimate for revising the ESF-6 Annex

Task	Staff	Hours	Estimated Cost ²¹
Identify gaps/required changes/references	EM Program Manager	16	\$1,166
	EM Program Coordinator	16	\$1,035
Coordinate with affected jurisdictions/stakeholders	EM Program Manager	16	\$1,166
	EM Program Coordinator	60	\$3,884
Develop draft revision and circulate for comment	EM Program Manager	32	\$2,332
	EM Program Coordinator	72	\$4,661
Finalize Annex and distribute/socialize	EM Program Manager	24	\$1,749
	EM Program Coordinator	40	\$2,589
Total Estimated Cost:			\$18,582

6. **Identify/Evaluate ARC/Non-ARC Sites:** Identify and evaluate potential ARC and non-ARC shelter sites in coordination with stakeholder organizations/agencies. Enter and maintain shelter data in the National Shelter System (NSS).
7. **Incorporate Mass Care/Shelter Function:** Incorporate the Mass Care & Shelter function into future county-wide or regional exercises. Consider an annual Mass Care & Shelter workshop to orient new agency staff and cross-level updates in planning, training, exercises, and equipment.
8. **Identify Demand/Appropriateness for Mega-Shelter:** Identify the potential demand for and appropriateness for mega-shelter facilities and associated logistics support.
9. **Establish Procedures/Guide for Shelters:** Consider adopting established standard operating procedures or field operations guides (FOGs) that detail the set-up, operation and demobilization procedures for shelters.

²¹ Assumes Step 7 for each staff position and an hourly rate benefit overhead factor of 56%.

10. **Select Operational Standard County-wide:** Select an operational standard (ex. ARC Shelter Guide) and encourage training and exercises to that standard for all jurisdictions in the County.
11. **Identify Support Staff needed for Mass Care/Shelter operations:** Identify categories and quantity of staff needed to support all Mass Care and Shelter operations as part of formal Shelter Needs Assessment. Assign responsibility for identifying and training staff to County departments such as the Emergency Management Coordination Committee (EMCC). Develop additional training and exercise events specific to Mass Care & Shelter function tied to results of Formal Shelter Needs Assessment. Incorporate in multi-year TEP and assess as part of annual THIRA.

6.2.4. Public Education Recommendations

HIGH Priority

1. **Develop Cohesive/Sustained Public Ed Program County-wide:** Consider developing a more cohesive and sustained County dam safety public education program and integrate with current all-hazards efforts. Potential dam safety-specific strategies include:
 - a. Develop and make available dam failure inundation zone maps in an accessible format such as King County's iMap web site.
 - b. Develop standardized dam failure preparedness and response information in multiple languages and formats.
 - c. Develop public education outreach strategies that target AFN populations including those with limited English proficiency.
 - d. Consider incorporating dam failure into the Seattle and King County Ready hazard awareness web site.²²
 - e. Conduct community workshops in major dam inundation areas.
 - f. Exercise CodeRed warning system with delivery of test messages into major dam inundation areas. Evaluate effectiveness of delivery into each area and resident response to the test message.
 - g. Coordinate public education efforts with local jurisdictions, dam owners, and other stakeholders.
 - h. Review the National Academy of Science (NAS) report on Dam and Levee Safety and Community Resilience (2012). Chapters 3 and 4 outline key programmatic considerations and recommendations.

Ongoing, annual costs to maintain a full set of public education materials/resources and conduct outreach are estimated to be 50% of initial costs or approximately \$10,000.

²² Seattle and King County Ready, Beta Version, <https://hazardready.org/seattle/>

Table 30. Cost Estimate for developing initial dam failure public education program

Task	Staff	Hours	Estimated Cost²³
Develop/prepare Inundation Maps	EM Program Manager	8	\$ 583
	EM Program Coordinator	24	\$1,554
Develop dam failure preparedness content	EM Program Manager	8	\$ 583
	EM Program Coordinator	24	\$1,554
Develop AFN strategies/materials	EM Program Manager	24	\$1,749
	EM Program Coordinator	16	\$1,036
Incorporate dam failure into King County Ready website	EM Program Manager	4	\$ 291
	EM Program Coordinator	16	\$1,036
Exercise/evaluate warning system	EM Program Manager	16	\$1,166
	EM Program Coordinator	60	\$3,884
Coordinate with local jurisdictions/stakeholders	EM Program Manager	8	\$ 583
	EM Program Coordinator	16	\$1,036
Conduct public education outreach	EM Program Manager	16	\$1,166
	EM Program Coordinator	60	\$3,884
Total Estimated Cost:			\$20,105

2. **Quantify Ongoing Preparedness Attitudes and Preparedness Levels of Public:** Measure public attitudes towards preparedness and individual levels of preparedness via surveys or a formal public preparedness study.

- a. Conduct an annual phone survey similar to the 2012 Survey of the Effectiveness of Individual and Community Preparedness in King County or a focus group survey similar to the 2004 KCOEM Disaster and Emergency Preparedness Survey²⁴. Note: these approaches should be adjusted to ensure that attitudes and capabilities of AFN populations are represented. These surveys should be all-hazard and not limited to dam safety.
- b. Consider incorporating metrics regarding disaster preparedness attitudes and readiness into other ongoing annual County Community Surveys.

Ongoing contractor costs to develop and administer an annual community disaster preparedness survey range from \$35,000 to \$80,000. Costs to participate in the existing County community survey program would need to be identified in consultation with the sponsoring County department.

²³ Assumes Step 7 for each staff position and an hourly rate benefit overhead factor of 56%.

²⁴

http://www.kingcounty.gov/safety/prepare/residents_business/PersonalPreparedness/~media/safety/prepare/documents/PubEd/Research/2004HebertResearch.ashx

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APPENDIX A

Additional EAP Review Data

LIST OF TABLES

Table A-1. All Dams with EAPs Reviewed for Gap Analysis Report. A-1

Table A-2. Detailed EAP Component Review A-7

Table A-3. Dam EAPs Recommended for Text Revision and Updating. A-15

Table A-4. Dam EAPs with Inundation Mapping Gaps and Recommended for Revision..... A-20

Table A-5. Dam EAPs with Inundation Mapping Older than 5 Years and Recommended for Review.
..... A-23

Table A-6. Dam EAPs Recommended for Conducting Tabletop Exercises. A-27

Table A-1. All Dams with EAPs Reviewed for Gap Analysis Report

Dam Name	State ID No.	County	Owner Type	Owner	Hazard Class	Max Storage (ac-ft)	Dam Height (ft)
Culmback Dam	SN 07-208	Snohomish	Public	Snohomish PUD	1A	200,000	270
Masonry Dam (Cedar Falls Project)	KI 08-255	King	Public	Seattle City Light/Seattle Public Utilities	1A	175,000	225
Mud Mountain Dam	PI 10-300	King/Pierce	Federal	USACE	1A	156,000	425
Howard A. Hanson	KI 09-298	King	Federal	USACE	1A	136,700	235
Tolt River Dam	KI 07-177	King	Public	Seattle Public Utilities/ Seattle City Light	1A	67,200	213
Youngs Lake Outlet Dam	KI9-254	King	Public	Seattle Public Utilities	1A	18,908	30
Green Lake (Roosevelt) Reservoir	KI 08-0212	King	Public	Seattle Public Utilities	1A	181	25
Issaquah Highlands WSDOT Detention Pond Dam	KI 8-707	King	Public	City of Issaquah	1A	53	22
Madsen Creek West Basin Dam	KI 08-1862	King	Public	King County WLRD Stormwater Services Section	1A	27	6.5
Tapps Lake Dike No. 4	PI 10-296	Pierce	Private	Cascade Water Alliance	1B	58,340	45
Tapps Lake Dike No. 6	PI 10-423	Pierce	Private	Cascade Water Alliance	1B	43,000	26
Tapps Lake Dike No. 5	PI 10-422	Pierce	Private	Cascade Water Alliance	1B	40,000	24
Crystal Lake Dam	KI 08-0195	King	Private	Crystal Lake Inc.	1B	478	7
Panther Lake Detention Dam	KI10-1733	King	Private	Federal Way National Little League	1B	339	12
Welcome Lake Dam	KI 08-0194	King	Private	Lake of the Woods HOA	1B	260	25
Lake Forest Park Reservoir	KI 08-217	King	Public	Seattle Public Utilities	1B	208	40

Table A-1. All Dams with EAPs Reviewed for Gap Analysis Report (cont.)

Dam Name	State ID No.	County	Owner Type	Owner	Hazard Class	Max Storage (ac-ft)	Dam Height (ft)
Panther Lake Ballfield Dam	KI10-1737	King	Private	Federal Way National Little League	1B	102	15
Bitter Lake Reservoir	KI 08-0213	King	Public	Seattle Public Utilities	1B	71	31
Issaquah Highlands Upper Reid Detention Pond Dam	KI 8-680	King	Public	City of Issaquah	1B	69	38
Volunteer Park Reservoir	KI 08-210	King	Public	Seattle Public Utilities	1B	69	42
Microsoft Issaquah Highlands SW Pond	KI 08-1917	King	Private	Microsoft Corporation	1B	43	20
Cedar Way Stormwater Detention Dam	SN 8-1404	Snohomish	Public	City of Mountlake Terrace	1B	40	30
High Point Stormwater Pond	KI 08-1651	King	Public	City of Bellevue	1B	30	13
Johnson Pond Dam	KI 08-1999	King	Public	King County WLRD	1B	25	15
High Point Stormwater Pond	KI 09-1869	King	Public	Seattle Housing Authority	1B	22	15.5
Panther Lk. First Ave. Detention Pond	KI10-1747	King	Private	Federal Way National Little League	1B	18	9
Newcastle Stormwater Pond 3 Dam	KI 08-1908	King	Public	City of Newcastle	1B	13	12
369th St. Detention Pond	KI 110-1811	King	Private	Enchanted Parks	1C	Unknown	17.8
Corliss Enumclaw Gravel Pit	NONE	King	Private	Corliss Resources Inc.	1C	Unknown	8
Tapps Lake Dike No. 11	PI 10-427	Pierce	Private	Cascade Water Alliance	1C	38,000	23
Tapps Lake Dike No. 3	PI 10-421	Pierce	Private	Cascade Water Alliance	1C	28,000	15

Table A-1. All Dams with EAPs Reviewed for Gap Analysis Report (cont.)

Dam Name	State ID No.	County	Owner Type	Owner	Hazard Class	Max Storage (ac-ft)	Dam Height (ft)
Youngs Lake New Inlet Dam	KI9-415	King	Public	Seattle Public Utilities	1C	16,838	25
Lake Margaret Dam	KI 07-236	King	Private	Lake Margaret Community Purposes Club	1C	1,200	39
Lake Marcel Dam	KI 07-0200	King	Private	Lake Marcel Community Club	1C	350	24
Tuck Lake Dam	K107-180	King	Private	Lake Tuck HOA	1C	290	51
Port of Seattle, Industrial Wastewater Lagoon #3	KI 9-671	King	Public	Port of Seattle	1C	256	31.5
Kayak Lake Dam	SN 07-0199	Snohomish	Private	Mountain View Community Club	1C	230	28
Yellow Lake Dam	KI 08-559	King	Public	King County WLRD Stormwater Services Section	1C	220	14
Icon Materials Auburn Sediment Pond	KI 10-683	King	Private	Icon Materials	1C	200	120
Redmond Ridge Drive EC 4N Roadway Dam	KI 08-1837	King	Public	King County WLRD	1C	148	7
Upper Mill Creek Stormwater Detention Dam	KI 09-0582	King	Public	City of Kent	1C	100	14
Issaquah Highlands South Detention Pond Dam	KI 08-0688	King	Public	City of Issaquah	1C	68	27
Redmond Ridge Cedar Dam	KI 08-1802	King	Public	City of Redmond	1C	62	26
Trossachs Detention Facility PC-2	KI 07-1833	King	Public	City of Sammamish	1C	55	17
Genesee Detention Dam	KI 09-380	King	Public	City of Seattle Parks Dept	1C	52	32

Table A-1. All Dams with EAPs Reviewed for Gap Analysis Report (cont.)

Dam Name	State ID No.	County	Owner Type	Owner	Hazard Class	Max Storage (ac-ft)	Dam Height (ft)
Redmond Ridge East SRN2 Dam	KI 07-1892	King	Private	Redmond Ridge East LLC	1C	52	13.5
South 336th St. Stormwater Det. Pond	KI 10-1767	King	Private	Federal Way National Little League	1C	49	19
Kitts Corner Det. Pond	KI 10-1754	King	Private	Federal Way National Little League	1C	46	12
Redmond Ridge East Pond SRS 1 No. 1	KI 07-1922	King	Private	Redmond Ridge East LLC	1C	39	10
Silver Firs Detention Pond No. 3	SN 08-1792	Snohomish	Private	Silver Firs Community Association	1C	36	14
Issaquah Highlands NPE Pond Dam	KI 08-1867	King	Public	City of Issaquah	1C	36	23
Sea-Tac Airport Pond M	KI 09-2038	King	Public	Port of Seattle	1C	27	11
South Ridge Stormwater Detention Dam	KI 08-1820	King	Private	Agynbyte LLC	1C	25	10
Issaquah Highlands NP2 Det. Pond Dam	KI 08-1858	King	Public	City of Issaquah	1C	24	28
Mill Creek Canyon Stormwater Detention Dam	KI 09-1443	King	Public	City of Kent	1C	18	15
Snoqualmie Ridge Douglas Ave. Pond D1 Dam	KI 07-1804	King	Public	City of Snoqualmie	1C	18	10
Trossachs Pond PC-3	KI 07-1787	King	Public	City of Sammamish	1C	18	15
Mill Pond Dam	KI 10-1716	King	Public	City of Auburn	1C	16	10
Shoreview Park North Pond Dam Embankment	KI 08-1782	King	Public	City of Shoreline	1C	14	41
Tapps Lake Dike No. 8	PI 10-424	Pierce	Private	Cascade Water Alliance	2	34,000	20

Table A-1. All Dams with EAPs Reviewed for Gap Analysis Report (cont.)

Dam Name	State ID No.	County	Owner Type	Owner	Hazard Class	Max Storage (ac-ft)	Dam Height (ft)
Tapps Lake Dike No. 10	PI 10-426	Pierce	Private	Cascade Water Alliance	2	32,000	19
Tapps Lake Dike No. 2B	PI 10-420	Pierce	Private	Cascade Water Alliance	2	28,000	16
Tapps Lake Dike No. 9	PI 10-425	Pierce	Private	Cascade Water Alliance	2	26,000	15
Tapps Lake Dike No. 12	PI 10-428	Pierce	Private	Cascade Water Alliance	2	25,000	14
Tapps Lake Dike No. 1	PI 10-418	Pierce	Private	Cascade Water Alliance	2	22,000	18
Tapps Lake Dike No. 2A	PI 10-419	Pierce	Private	Cascade Water Alliance	2	20,000	9
Youngs Lake Cascades Dam	KI9-209	King	Public	Seattle Public Utilities	2	12,320	16
Tapps Lake Dike No. 13	PI 10-429	Pierce	Private	Cascade Water Alliance	2	10,000	6
Tolt River Regulated Basin South Dam	KI 07-238	King	Public	Seattle Public Utilities/ Seattle City Light	2	1,100	60
Tolt River Regulated Basin West Dam	KI 07-237	King	Public	Seattle Public Utilities/ Seattle City Light	2	1,100	43
Newcastle Railroad Embankment Dam	KI 08-0648	King	Public	Seattle City Light	2	200	60
Des Moines Ck Reg Det Pond West Berm	KI 09-692	King	Public	Des Moines Creek Basin Committee	2	160	14
Lake Kittyprince Dam	KI 07-0201	King	Public	WA DNR	2	96	15
Klahanie Dam No. 13	KI 08-0602	King	Public	City of Sammamish	2	56	13
Garrison Creek Dam	KI 09-650	King	Public	City of Kent Public Works	2	40	45

Table A-1. All Dams with EAPs Reviewed for Gap Analysis Report (cont.)

Dam Name	State ID No.	County	Owner Type	Owner	Hazard Class	Max Storage (ac-ft)	Dam Height (ft)
Des Moines Ck Reg Det Facility East Berm	KI 09-693	King	Public	Des Moines Creek Basin Committee	2	31	14
Klahanie Dam No. 1	KI 08-1484	King	Public	City of Sammamish	2	28	10
SeaTac Airport Pond G	KI 09-1972	King	Public	Port of Seattle	2	27	10.5
Des Moines Creek Stormwater Detention	KI 09-1649	King	Public	Port of Seattle	2	23	18
Boeing Creek M1 Dam	KI 08-0483	King	Public	City of Shoreline	2	14	36
Quadrant Corp. Parcel 1-East Pond	KI 10-1815	King	Public	King County	2	13	10
Lakeland South Pond No. 1	PI 10-1845	Pierce	Public	City of Auburn	2	12	13

Table A-2. Detailed EAP Component Review

Legend for highlighted cells	Columns 1 through 9:	= Complete		= Partial				= Missing						
	Column 10:	= <1 Year		= 1-5 Years				= 1-5 Years				= 10+ Years		
Dam Name	Owner	Hazard Class	Max Storage (ac-ft)	Dam Height (ft)	[1] Roles and Resp.	[2] Event Detection	[3] Emergency Lev. Determin.	[4] Notif. and Comm.	[5] Expected Actions	[6] Event Termination	[7] Inundation Mapping	[8] Training	[9] Tabletop Exercises	[10] EAPs Last Updated
Culmback Dam	Snohomish PUD	1A	200,000	270										
Masonry Dam (Cedar Falls Project)	Seattle City Light/Seattle Public Utilities	1A	175,000	225										
Mud Mountain Dam	USACE	1A	156,000	425										
Howard A. Hanson	USACE	1A	136,700	235										
Tolt River Dam	Seattle Public Utilities/ Seattle City Light	1A	67,200	213										
Youngs Lake Outlet Dam	Seattle Public Utilities	1A	18,908	30										
Green Lake (Roosevelt) Reservoir	Seattle Public Utilities	1A	181	25										
Issaquah Highlands WSDOT Detention Pond Dam	City of Issaquah	1A	53	22										
Madsen Creek West Basin Dam	King County WLRD Stormwater Services Section	1A	27	6.5										
Tapps Lake Dike No. 4	Cascade Water Alliance	1B	58,340	45										

Table A-2. Detailed EAP Component Review Data (cont.)

Legend for highlighted cells	Columns 1 through 9:	= Complete		= Partial				= Missing						
	Column 10:	= <1 Year		= 1-5 Years				= 1-5 Years				= 10+ Years		
Dam Name	Owner	Hazard Class	Max Storage (ac-ft)	Dam Height (ft)	[1] Roles and Resp.	[2] Event Detection	[3] Emergency Lev. Determ.	[4] Notif. and Comm.	[5] Expected Actions	[6] Event Termination	[7] Inundation Mapping	[8] Training	[9] Tabletop Exercises	[10] EAPs Last Updated
Tapps Lake Dike No. 6	Cascade Water Alliance	1B	43,000	26										
Tapps Lake Dike No. 5	Cascade Water Alliance	1B	40,000	24										
Crystal Lake Dam	Crystal Lake Inc.	1B	478	7										
Panther Lake Detention Dam	Federal Way National Little League	1B	339	12										
Welcome Lake Dam	Lake of the Woods HOA	1B	260	25										
Lake Forest Park Reservoir	Seattle Public Utilities	1B	208	40										
Panther Lake Ballfield Dam	Federal Way National Little League	1B	102	15										
Bitter Lake Reservoir	Seattle Public Utilities	1B	71	31										
Volunteer Park Reservoir	Seattle Public Utilities	1B	69	42										
Issaquah Highlands Upper Reid Detention Pond Dam	City of Issaquah	1B	69	38										
Microsoft Issaquah Highlands SW Pond	Microsoft Corporation	1B	43	20										

Table A-2. Detailed EAP Component Review Data (cont.)

Legend for highlighted cells	Columns 1 through 9:	= Complete		= Partial				= Missing						
	Column 10:	= <1 Year		= 1-5 Years				= 1-5 Years				= 10+ Years		
Dam Name	Owner	Hazard Class	Max Storage (ac-ft)	Dam Height (ft)	[1] Roles and Resp.	[2] Event Detection	[3] Emergency Lev. Determ.	[4] Notif. and Comm.	[5] Expected Actions	[6] Event Termination	[7] Inundation Mapping	[8] Training	[9] Tabletop Exercises	[10] EAPs Last Updated
Cedar Way Stormwater Detention Dam	City of Mountlake Terrace	1B	40	30										
Lakemont Detention Pond	City of Bellevue	1B	30	13										
Johnson Pond Dam	King County WLRD	1B	25	15										
High Point Stormwater Pond	Seattle Housing Authority	1B	22	15.5										
Panther Lk. First Ave. Detention Pond	Federal Way National Little League	1B	18	9										
Newcastle Stormwater Pond 3 Dam	City of Newcastle	1B	13	12										
Tapps Lake Dike No. 11	Cascade Water Alliance	1C	38,000	23										
Tapps Lake Dike No. 3	Cascade Water Alliance	1C	28,000	15										
Youngs Lake New Inlet Dam	Seattle Public Utilities	1C	16,838	25										
Lake Margaret Dam	Lake Margaret Community Purposes Club	1C	1,200	39										
Lake Marcel Dam	Lake Marcel Community Club	1C	350	24										
Tuck Lake Dam	Lake Tuck HOA	1C	290	51										

Table A-2. Detailed EAP Component Review Data (cont.)

Legend for highlighted cells	Columns 1 through 9:	= Complete		= Partial				= Missing						
	Column 10:	= <1 Year		= 1-5 Years				= 1-5 Years				= 10+ Years		
Dam Name	Owner	Hazard Class	Max Storage (ac-ft)	Dam Height (ft)	[1] Roles and Resp.	[2] Event Detection	[3] Emergency Lev. Determ.	[4] Notif. and Comm.	[5] Expected Actions	[6] Event Termination	[7] Inundation Mapping	[8] Training	[9] Tabletop Exercises	[10] EAPs Last Updated
Port of Seattle, Industrial Wastewater Lagoon #3	Port of Seattle	1C	256	31.5										
Kayak Lake Dam	Mountain View Community Club	1C	230	28										
Yellow Lake Dam	King County WLRD Stormwater Services Section	1C	220	14										
Icon Materials Auburn Sediment Pond	Icon Materials	1C	200	120										
Redmond Ridge Drive EC 4N Roadway Dam	King County WLRD	1C	148	7										
Upper Mill Creek Stormwater Detention Dam	City of Kent	1C	100	14										
Issaquah Highlands South Detention Pond Dam	City of Issaquah	1C	68	27										
Redmond Ridge Cedar Dam	City of Redmond	1C	62	26										

Table A-2. Detailed EAP Component Review Data (cont.)

Legend for highlighted cells	Columns 1 through 9:	= Complete		= Partial				= Missing						
	Column 10:	= <1 Year		= 1-5 Years				= 1-5 Years				= 10+ Years		
Dam Name	Owner	Hazard Class	Max Storage (ac-ft)	Dam Height (ft)	[1] Roles and Resp.	[2] Event Detection	[3] Emergency Lev. Determ.	[4] Notif. and Comm.	[5] Expected Actions	[6] Event Termination	[7] Inundation Mapping	[8] Training	[9] Tabletop Exercises	[10] EAPs Last Updated
Trossachs Detention Facility PC-2	City of Sammamish	1C	55	17										
Genesee Detention Dam	City of Seattle Parks Dept	1C	52	32										
Redmond Ridge East SRN2 Dam	Redmond Ridge East LLC	1C	52	13.5										
South 336th St. Stormwater Det. Pond	Federal Way National Little League	1C	49	19										
Kitts Corner Det. Pond	Federal Way National Little League	1C	46	12										
Redmond Ridge East Pond SRS 1 No. 1	Redmond Ridge East LLC	1C	39	10										
Issaquah Highlands NPE Pond Dam	City of Issaquah	1C	36	23										
Silver Firs Detention Pond No. 3	Silver Firs Community Association	1C	36	14										
Sea-Tac Airport Pond M	Port of Seattle	1C	27	11										
South Ridge Stormwater Detention Dam	Agnynbyte LLC	1C	25	10										

Table A-2. Detailed EAP Component Review Data (cont.)

Legend for highlighted cells	Columns 1 through 9:	= Complete		= Partial				= Missing						
	Column 10:	= <1 Year		= 1-5 Years				= 1-5 Years				= 10+ Years		
Dam Name	Owner	Hazard Class	Max Storage (ac-ft)	Dam Height (ft)	[1] Roles and Resp.	[2] Event Detection	[3] Emergency Lev. Determ.	[4] Notif. and Comm.	[5] Expected Actions	[6] Event Termination	[7] Inundation Mapping	[8] Training	[9] Tabletop Exercises	[10] EAPs Last Updated
Issaquah Highlands NP2 Det. Pond Dam	City of Issaquah	1C	24	28										
Mill Creek Canyon Stormwater Detention Dam	City of Kent	1C	18	15										
Trossachs Pond PC-3	City of Sammamish	1C	18	15										
Snoqualmie Ridge Douglas Ave. Pond D1 Dam	City of Snoqualmie	1C	18	10										
Mill Pond Dam	City of Auburn	1C	16	10										
Shoreview Park North Pond Dam Embankment	City of Shoreline	1C	14	41										
369th St. Detention Pond	Enchanted Parks	1C	Unknown	17.8										
Corliss Enumclaw Gravel Pit	Corliss Resources Inc.	1C	Unknown	8										
Tapps Lake Dike No. 8	Cascade Water Alliance	2	34,000	20										
Tapps Lake Dike No. 10	Cascade Water Alliance	2	32,000	19										
Tapps Lake Dike No. 2B	Cascade Water Alliance	2	28,000	16										

Table A-2. Detailed EAP Component Review Data (cont.)

Legend for highlighted cells	Columns 1 through 9:	= Complete		= Partial				= Missing						
	Column 10:	= <1 Year		= 1-5 Years				= 1-5 Years				= 10+ Years		
Dam Name	Owner	Hazard Class	Max Storage (ac-ft)	Dam Height (ft)	[1] Roles and Resp.	[2] Event Detection	[3] Emergency Lev. Determ.	[4] Notif. and Comm.	[5] Expected Actions	[6] Event Termination	[7] Inundation Mapping	[8] Training	[9] Tabletop Exercises	[10] EAPs Last Updated
Tapps Lake Dike No. 9	Cascade Water Alliance	2	26,000	15										
Tapps Lake Dike No. 12	Cascade Water Alliance	2	25,000	14										
Tapps Lake Dike No. 1	Cascade Water Alliance	2	22,000	18										
Tapps Lake Dike No. 2A	Cascade Water Alliance	2	20,000	9										
Youngs Lake Cascades Dam	Seattle Public Utilities	2	12,320	16										
Tapps Lake Dike No. 13	Cascade Water Alliance	2	10,000	6										
Tolt River Regulated Basin South Dam	Seattle Public Utilities/ Seattle City Light	2	1,100	60										
Tolt River Regulated Basin West Dam	Seattle Public Utilities/ Seattle City Light	2	1,100	43										
Newcastle Railroad Embankment Dam	Seattle City Light	2	200	60										
Des Moines Ck Reg Det Pond West Berm	Des Moines Creek Basin Committee	2	160	14										
Lake Kittyprince Dam	WA DNR	2	96	15										

Table A-2. Detailed EAP Component Review Data (cont.)

Legend for highlighted cells	Columns 1 through 9:	= Complete		= Partial				= Missing						
	Column 10:	= <1 Year		= 1-5 Years				= 1-5 Years				= 10+ Years		
Dam Name	Owner	Hazard Class	Max Storage (ac-ft)	Dam Height (ft)	[1] Roles and Resp.	[2] Event Detection	[3] Emergency Lev. Determ.	[4] Notif. and Comm.	[5] Expected Actions	[6] Event Termination	[7] Inundation Mapping	[8] Training	[9] Tabletop Exercises	[10] EAPs Last Updated
Klahanie Dam No. 13	City of Sammamish	2	56	13										
Garrison Creek Dam	City of Kent Public Works	2	40	45										
Des Moines Ck Reg Det Facility East Berm	Des Moines Creek Basin Committee	2	31	14										
Klahanie Dam No. 1	City of Sammamish	2	28	10										
SeaTac Airport Pond G	Port of Seattle	2	27	10.5										
Des Moines Creek Stormwater Detention	Port of Seattle	2	23	18										
Boeing Creek M1 Dam	City of Shoreline	2	14	36										
Quadrant Corp. Parcel 1-East Pond	King County	2	13	10										
Lakeland South Pond No. 1	City of Auburn	2	12	13										

Table A-3. Dam EAPs Recommended for Text Revision and Updating

Dam Name	State ID No.	County	Owner Type	Owner	Hazard Class	Max Storage (ac-ft)	Dam Height (ft)	Most Recent EAP Date
Masonry Dam (Cedar Falls Project)	KI 08-255	King	Public	Seattle City Light/Seattle Public Utilities	1A	175,000	225	1/2014
Mud Mountain Dam	PI 10-300	King/Pierce	Federal	USACE	1A	156,000	425	7/2016
Howard A. Hanson	KI 09-298	King	Federal	USACE	1A	136,700	235	6/2016
Tolt River Dam	KI 07-177	King	Public	Seattle Public Utilities/ Seattle City Light	1A	67,200	213	2/2016
Green Lake (Roosevelt) Reservoir	KI 08-0212	King	Public	Seattle Public Utilities	1A	181	25	3/2011
Issaquah Highlands WSDOT Detention Pond Dam	KI 8-707	King	Public	City of Issaquah	1A	53	22	10/2009
Madsen Creek West Basin Dam	KI 08-1862	King	Public	King County WLRD Stormwater Services Section	1A	27	6.5	9/2012
Crystal Lake Dam	KI 08-0195	King	Private	Crystal Lake Inc.	1B	478	7	1/2014
Panther Lake Detention Dam	KI10-1733	King	Private	Federal Way National Little League	1B	339	12	9/2007
Welcome Lake Dam	KI 08-0194	King	Private	Lake of the Woods HOA	1B	260	25	8/2012
Lake Forest Park Reservoir	KI 08-217	King	Public	Seattle Public Utilities	1B	208	40	3/2011
Panther Lake Ballfield Dam	KI10-1737	King	Private	Federal Way National Little League	1B	102	15	9/2007
Bitter Lake Reservoir	KI 08-0213	King	Public	Seattle Public Utilities	1B	71	31	3/2011
Issaquah Highlands Upper Reid Detention Pond Dam	KI 8-680	King	Public	City of Issaquah	1B	69	38	10/2009
Volunteer Park Reservoir	KI 08-210	King	Public	Seattle Public Utilities	1B	69	42	3/2011

Table A-3. Dam EAPs Recommended for Text Revision and Updating (cont.)

Dam Name	State ID No.	County	Owner Type	Owner	Hazard Class	Max Storage (ac-ft)	Dam Height (ft)	Most Recent EAP Date
Microsoft Issaquah Highlands SW Pond	KI 08-1917	King	Private	Microsoft Corporation	1B	43	20	7/2009
Cedar Way Stormwater Detention Dam	SN 8-1404	Snohomish	Public	City of Mountlake Terrace	1B	40	30	1/2010
Lakemont Detention Pond	KI 08-1651	King	Public	City of Bellevue	1B	30	13	6/2001
Johnson Pond Dam	KI 08-1999	King	Public	King County WLRD	1B	25	15	10/2012
High Point Stormwater Pond	KI 09-1869	King	Public	Seattle Housing Authority	1B	22	15.5	12/2015
Panther Lk. First Ave. Detention Pond	KI10-1747	King	Private	Federal Way National Little League	1B	18	9	9/2007
Newcastle Stormwater Pond 3 Dam	KI 08-1908	King	Public	City of Newcastle	1B	13	12	8/2006
369th St. Detention Pond	KI 110-1811	King	Private	Enchanted Parks	1C	Unknown	17.8	12/1999
Corliss Enumclaw Gravel Pit	NONE	King	Private	Corliss Resources Inc.	1C	Unknown	8	3/2006
Lake Margaret Dam	KI 07-236	King	Private	Lake Margaret Community Purposes Club	1C	1,200	39	12/2001
Lake Marcel Dam	KI 07-0200	King	Private	Lake Marcel Community Club	1C	350	24	4/2016
Tuck Lake Dam	K107-180	King	Private	Lake Tuck HOA	1C	290	51	12/2004
Port of Seattle, Industrial Wastewater Lagoon #3	KI 9-671	King	Public	Port of Seattle	1C	256	31.5	10/2002
Kayak Lake Dam	SN 07-0199	Snohomish	Private	Mountain View Community Club	1C	230	28	1/2013

Table A-3. Dam EAPs Recommended for Text Revision and Updating (cont.)

Dam Name	State ID No.	County	Owner Type	Owner	Hazard Class	Max Storage (ac-ft)	Dam Height (ft)	Most Recent EAP Date
Yellow Lake Dam	KI 08-559	King	Public	King County WLRD Stormwater Services Section	1C	220	14	12/2004
Icon Materials Auburn Sediment Pond	KI 10-683	King	Private	Icon Materials	1C	200	120	11/2014
Redmond Ridge Drive EC 4N Roadway Dam	KI 08-1837	King	Public	King County WLRD	1C	148	7	2/2004
Upper Mill Creek Stormwater Detention Dam	KI 09-0582	King	Public	City of Kent	1C	100	14	8/1996
Issaquah Highlands South Detention Pond Dam	KI 08-0688	King	Public	City of Issaquah	1C	68	27	10/2009
Redmond Ridge Cedar Dam	KI 08-1802	King	Public	City of Redmond	1C	62	26	5/2002
Trossachs Detention Facility PC-2	KI 07-1833	King	Public	City of Sammamish	1C	55	17	2/2003
Redmond Ridge East SRN2 Dam	KI 07-1892	King	Private	Redmond Ridge East LLC	1C	52	13.5	11/2008
South 336th St. Stormwater Det. Pond	KI 10-1767	King	Private	Federal Way National Little League	1C	49	19	1/1997
Kitts Corner Det. Pond	KI 10-1754	King	Private	Federal Way National Little League	1C	46	12	1/1997
Redmond Ridge East Pond SRS 1 No. 1	KI 07-1922	King	Private	Redmond Ridge East LLC	1C	39	10	8/2014
Silver Firs Detention Pond No. 3	SN 08-1792	Snohomish	Private	Silver Firs Community Association	1C	36	14	4/2007
Issaquah Highlands NPE Pond Dam	KI 08-1867	King	Public	City of Issaquah	1C	36	23	10/2009
Sea-Tac Airport Pond M	KI 09-2038	King	Public	Port of Seattle	1C	27	11	4/2016
South Ridge Stormwater Detention Dam	KI 08-1820	King	Private	Agynbyte LLC	1C	25	10	1/2001

Table A-3. Dam EAPs Recommended for Text Revision and Updating (cont.)

Dam Name	State ID No.	County	Owner Type	Owner	Hazard Class	Max Storage (ac-ft)	Dam Height (ft)	Most Recent EAP Date
Issaquah Highlands NP2 Det. Pond Dam	KI 08-1858	King	Public	City of Issaquah	1C	24	28	1/2009
Mill Creek Canyon Stormwater Detention Dam	KI 09-1443	King	Public	City of Kent	1C	18	15	8/1996
Snoqualmie Ridge Douglas Ave. Pond D1 Dam	KI 07-1804	King	Public	City of Snoqualmie	1C	18	10	2/2014
Trossachs Pond PC-3	KI 07-1787	King	Public	City of Sammamish	1C	18	15	1/2004
Mill Pond Dam	KI 10-1716	King	Public	City of Auburn	1C	16	10	1/2010
Shoreview Park North Pond Dam Embankment	KI 08-1782	King	Public	City of Shoreline	1C	14	41	7/2007
Tolt River Regulated Basin South Dam	KI 07-238	King	Public	Seattle Public Utilities/ Seattle City Light	2	1,100	60	2/2016
Tolt River Regulated Basin West Dam	KI 07-237	King	Public	Seattle Public Utilities/ Seattle City Light	2	1,100	43	2/2016
Newcastle Railroad Embankment Dam	KI 08-0648	King	Public	Seattle City Light	2	200	60	3/1995
Des Moines Ck Reg Det Pond West Berm	KI 09-692	King	Public	Des Moines Creek Basin Committee	2	160	14	8/2009
Lake Kittyprince Dam	KI 07-0201	King	Public	WA DNR	2	96	15	10/2015
Klahanie Dam No. 13	KI 08-0602	King	Public	City of Sammamish	2	56	13	12/1997
Garrison Creek Dam	KI 09-650	King	Public	City of Kent Public Works	2	40	45	6/1996
Des Moines Ck Reg Det Facility East Berm	KI 09-693	King	Public	Des Moines Creek Basin Committee	2	31	14	8/2009
Klahanie Dam No. 1	KI 08-1484	King	Public	City of Sammamish	2	28	10	6/2000
SeaTac Airport Pond G	KI 09-1972	King	Public	Port of Seattle	2	27	10.5	11/2009

Table A-3. Dam EAPs Recommended for Text Revision and Updating (cont.)

Dam Name	State ID No.	County	Owner Type	Owner	Hazard Class	Max Storage (ac-ft)	Dam Height (ft)	Most Recent EAP Date
Des Moines Creek Stormwater Detention	KI 09-1649	King	Public	Port of Seattle	2	23	18	8/2009
Boeing Creek M1 Dam	KI 08-0483	King	Public	City of Shoreline	2	14	36	7/2007
Quadrant Corp. Parcel 1-East Pond	KI 10-1815	King	Public	King County	2	13	10	6/2000
Lakeland South Pond No. 1	PI 10-1845	Pierce	Public	City of Auburn	2	12	13	12/2010

Table A-4. Dam EAPs with Inundation Mapping Gaps and Recommended for Revision

Dam Name	State ID No.	County	Owner	Hazard Class	Max Storage (ac-ft)	Dam Height (ft)	Month/Year of Original Inundation Mapping*
Panther Lake Detention Dam	KI10-1733	King	Federal Way National Little League	1B	339	12	5/2000
Lake Forest Park Reservoir	KI 08-217	King	Seattle Public Utilities	1B	208	40	12/1992
Panther Lake Ballfield Dam	KI10-1737	King	Federal Way National Little League	1B	102	15	5/2000
Bitter Lake Reservoir	KI 08-0213	King	Seattle Public Utilities	1B	71	31	12/1992
Volunteer Park Reservoir	KI 08-210	King	Seattle Public Utilities	1B	69	42	12/1992
Issaquah Highlands Upper Reid Detention Pond Dam	KI 8-680	King	City of Issaquah	1B	69	38	10/2009 (Est.)
Microsoft Issaquah Highlands SW Pond	KI 08-1917	King	Microsoft Corporation	1B	43	20	7/2009 (Est.)
Lakemont Detention Pond	KI 08-1651	King	City of Bellevue	1B	30	13	NONE
Johnson Pond Dam	KI 08-1999	King	King County WLRD	1B	25	15	NONE
High Point Stormwater Pond	KI 09-1869	King	Seattle Housing Authority	1B	22	15.5	11/2003
Panther Lk. First Ave. Detention Pond	KI10-1747	King	Federal Way National Little League	1B	18	9	5/2000
Newcastle Stormwater Pond 3 Dam	KI 08-1908	King	City of Newcastle	1B	13	12	6/2006
Corliss Enumclaw Gravel Pit	NONE	King	Corliss Resources Inc.	1C	Unknown	8	3/2006 (Est.)
Youngs Lake New Inlet Dam	KI9-415	King	Seattle Public Utilities	1C	16,838	25	NONE
Lake Margaret Dam	KI 07-236	King	Lake Margaret Community Purposes Club	1C	1,200	39	12/2001 (Est.)

Table A-4. Dam EAPs with Inundation Mapping Gaps and Recommend for Revision (cont.)

Dam Name	State ID No.	County	Owner	Hazard Class	Max Storage (ac-ft)	Dam Height (ft)	Month/Year of Original Inundation Mapping*
Lake Marcel Dam	KI 07-0200	King	Lake Marcel Community Club	1C	350	24	4/2016 (Est.)
Port of Seattle, Industrial Wastewater Lagoon #3	KI 9-671	King	Port of Seattle	1C	256	31.5	NONE
Kayak Lake Dam	SN 07-0199	Snohomish	Mountain View Community Club	1C	230	28	1999 (Est.)
Icon Materials Auburn Sediment Pond	KI 10-683	King	Icon Materials	1C	200	120	1/2003 (Est.)
Redmond Ridge Drive EC 4N Roadway Dam	KI 08-1837	King	King County WLRD	1C	148	7	2/2004 (Est.)
Redmond Ridge Cedar Dam	KI 08-1802	King	City of Redmond	1C	62	26	5/2002
South 336th St. Stormwater Det. Pond	KI 10-1767	King	Federal Way National Little League	1C	49	19	NONE
Kitts Corner Det. Pond	KI 10-1754	King	Federal Way National Little League	1C	46	12	NONE
Silver Firs Detention Pond No. 3	SN 08-1792	Snohomish	Silver Firs Community Association	1C	36	14	4/2007 (Est.)
Trossachs Pond PC-3	KI 07-1787	King	City of Sammamish	1C	18	15	1/2004 (Est.)
Mill Pond Dam	KI 10-1716	King	City of Auburn	1C	16	10	NONE
Shoreview Park North Pond Dam Embankment	KI 08-1782	King	City of Shoreline	1C	14	41	7/2007 (Est.)
Youngs Lake Cascades Dam	KI9-209	King	Seattle Public Utilities	2	12,320	16	NONE

Table A-4. Dam EAPs with Inundation Mapping Gaps and Recommend for Revision (cont.)

Dam Name	State ID No.	County	Owner	Hazard Class	Max Storage (ac-ft)	Dam Height (ft)	Month/Year of Original Inundation Mapping*
Newcastle Railroad Embankment Dam	KI 08-0648	King	Seattle City Light	2	200	60	NONE
Des Moines Ck Reg Det Pond West Berm	KI 09-692	King	Des Moines Creek Basin Committee	2	160	14	NONE
Klahanie Dam No. 13	KI 08-0602	King	City of Sammamish	2	56	13	12/1997 (Est.)
Des Moines Ck Reg Det Facility East Berm	KI 09-693	King	Des Moines Creek Basin Committee	2	31	14	NONE
Klahanie Dam No. 1	KI 08-1484	King	City of Sammamish	2	28	10	6/2000 (Est.)
Des Moines Creek Stormwater Detention	KI 09-1649	King	Port of Seattle	2	23	18	NONE
Boeing Creek M1 Dam	KI 08-0483	King	City of Shoreline	2	14	36	12/2003

* Date of inundation mapping not specified therefore date is estimated based on the EAP creation date.

Table A-5. Dam EAPs with Inundation Mapping Older than 5 Years and Recommended for Review

Dam Name	State ID No.	County	Owner Type	Owner	Hazard Class	Inundation Month/Year*	Max Storage (ac-ft)	Dam Height (ft)
Masonry Dam (Cedar Falls Project)	KI 08-255	King	Public	Seattle City Light/Seattle Public Utilities	1A	7/1996	175,000	225
Mud Mountain Dam	PI 10-300	King/Pierce	Federal	USACE	1A	6/2010	156,000	425
Youngs Lake Outlet Dam	KI9-254	King	Public	Seattle Public Utilities	1A	07/2011	18,908	30
Green Lake (Roosevelt) Reservoir	KI 08-0212	King	Public	Seattle Public Utilities	1A	12/1992	181	25
Issaquah Highlands WSDOT Detention Pond Dam	KI 8-707	King	Public	City of Issaquah	1A	12/2006	53	22
Madsen Creek West Basin Dam	KI 08-1862	King	Public	King County WLRD Stormwater Services Section	1A	2/2005 (Est.)	27	6.5
Crystal Lake Dam	KI 08-0195	King	Private	Crystal Lake Inc.	1B	11/2008	478	7
Panther Lake Detention Dam	KI10-1733	King	Private	Federal Way National Little League	1B	5/2000	339	12
Welcome Lake Dam	KI 08-0194	King	Private	Lake of the Woods HOA	1B	2006	260	25
Lake Forest Park Reservoir	KI 08-217	King	Public	Seattle Public Utilities	1B	12/1992	208	40
Panther Lake Ballfield Dam	KI10-1737	King	Private	Federal Way National Little League	1B	5/2000	102	15
Bitter Lake Reservoir	KI 08-0213	King	Public	Seattle Public Utilities	1B	12/1992	71	31
Issaquah Highlands Upper Reid Detention Pond Dam	KI 8-680	King	Public	City of Issaquah	1B	10/2009 (Est.)	69	38
Volunteer Park Reservoir	KI 08-210	King	Public	Seattle Public Utilities	1B	12/1992	69	42
Microsoft Issaquah Highlands SW Pond	KI 08-1917	King	Private	Microsoft Corporation	1B	4/2008	43	20

Table A-5. Dam EAPs with Inundation Mapping Older than 5 Years and Recommended for Review (cont.)

Dam Name	State ID No.	County	Owner Type	Owner	Hazard Class	Inundation Month/Year*	Max Storage (ac-ft)	Dam Height (ft)
Cedar Way Stormwater Detention Dam	SN 8-1404	Snohomish	Public	City of Mountlake Terrace	1B	1/2010 (Est.)	40	30
High Point Stormwater Pond	KI 09-1869	King	Public	Seattle Housing Authority	1B	11/2003	22	15.5
Panther Lk. First Ave. Detention Pond	KI10-1747	King	Private	Federal Way National Little League	1B	5/2000	18	9
Newcastle Stormwater Pond 3 Dam	KI 08-1908	King	Public	City of Newcastle	1B	6/2006	13	12
369th St. Detention Pond	KI 110-1811	King	Private	Enchanted Parks	1C	10/1998	Unknown	17.8
Corliss Enumclaw Gravel Pit	NONE	King	Private	Corliss Resources Inc.	1C	3/2006 (Est.)	Unknown	8
Lake Margaret Dam	KI 07-236	King	Private	Lake Margaret Community Purposes Club	1C	12/2001 (Est.)	1,200	39
Tuck Lake Dam	K107-180	King	Private	Lake Tuck HOA	1C	7/2004 (Est.)	290	51
Kayak Lake Dam	SN 07-0199	Snohomish	Private	Mountain View Community Club	1C	1999 (Est.)	230	28
Yellow Lake Dam	KI 08-559	King	Public	King County WLRD Stormwater Services Section	1C	12/2004 (Est)	220	14
Icon Materials Auburn Sediment Pond	KI 10-683	King	Private	Icon Materials	1C	1/2003 (Est.)	200	120
Redmond Ridge Drive EC 4N Roadway Dam	KI 08-1837	King	Public	King County WLRD	1C	2/2004 (Est.)	148	7
Upper Mill Creek Stormwater Detention Dam	KI 09-0582	King	Public	City of Kent	1C	4/1996	100	14
Issaquah Highlands South Detention Pond Dam	KI 08-0688	King	Public	City of Issaquah	1C	10/2007	68	27

Table A-5. Dam EAPs with Inundation Mapping Older than 5 Years and Recommended for Review (cont.)

Dam Name	State ID No.	County	Owner Type	Owner	Hazard Class	Inundation Month/Year*	Max Storage (ac-ft)	Dam Height (ft)
Redmond Ridge Cedar Dam	KI 08-1802	King	Public	City of Redmond	1C	5/2002	62	26
Trossachs Detention Facility PC-2	KI 07-1833	King	Public	City of Sammamish	1C	3/2000 (Est.)	55	17
Genesee Detention Dam	KI 09-380	King	Public	City of Seattle Parks Dept	1C	1996	52	32
Redmond Ridge East SRN2 Dam	KI 07-1892	King	Private	Redmond Ridge East LLC	1C	10/2008	52	13.5
Silver Firs Detention Pond No. 3	SN 08-1792	Snohomish	Private	Silver Firs Community Association	1C	4/2007 (Est.)	36	14
Issaquah Highlands NPE Pond Dam	KI 08-1867	King	Public	City of Issaquah	1C	10/2007 (Est.)	36	23
Sea-Tac Airport Pond M	KI 09-2038	King	Public	Port of Seattle	1C	1/2001	27	11
South Ridge Stormwater Detention Dam	KI 08-1820	King	Private	Agynbyte LLC	1C	6/1999 (Est.)	25	10
Issaquah Highlands NP2 Det. Pond Dam	KI 08-1858	King	Public	City of Issaquah	1C	10/2007 (Est.)	24	28
Mill Creek Canyon Stormwater Detention Dam	KI 09-1443	King	Public	City of Kent	1C	4/1997	18	15
Snoqualmie Ridge Douglas Ave. Pond D1 Dam	KI 07-1804	King	Public	City of Snoqualmie	1C	12/2003 (Est.)	18	10
Trossachs Pond PC-3	KI 07-1787	King	Public	City of Sammamish	1C	8/1999 (Est.)	18	15
Shoreview Park North Pond Dam Embankment	KI 08-1782	King	Public	City of Shoreline	1C	4/1999 (Est.)	14	41
Klahanie Dam No. 13	KI 08-0602	King	Public	City of Sammamish	2	12/1997 (Est.)	56	13
Garrison Creek Dam	KI 09-650	King	Public	City of Kent Public Works	2	1996	40	45

Table A-5. Dam EAPs with Inundation Mapping Older than 5 Years and Recommended for Review (cont.)

Dam Name	State ID No.	County	Owner Type	Owner	Hazard Class	Inundation Month/Year*	Max Storage (ac-ft)	Dam Height (ft)
Klahanie Dam No. 1	KI 08-1484	King	Public	City of Sammamish	2	6/2000 (Est.)	28	10
SeaTac Airport Pond G	KI 09-1972	King	Public	Port of Seattle	2	5/2009 (Est.)	27	10.5
Boeing Creek M1 Dam	KI 08-0483	King	Public	City of Shoreline	2	12/2003	14	36
Quadrant Corp. Parcel 1-East Pond	KI 10-1815	King	Public	King County	2	3/2000	13	10
Lakeland South Pond No. 1	PI 10-1845	Pierce	Public	City of Auburn	2	12/2003 (Est.)	12	13

* Date of inundation mapping not specified therefore date is estimated based on the EAP creation date.

Table A-6. Dam EAPs Recommended for Conducting Tabletop Exercises

Dam Name	State ID No.	County	Owner Type	Owner	Hazard Class	Max Storage (ac-ft)	Dam Height (ft)	Date of Last Tabletop Exercise
Culmback Dam	SN 07-208	Snohomish	Public	Snohomish PUD	1A	200,000	270	6/23/2010
Masonry Dam (Cedar Falls Project)	KI 08-255	King	Public	Seattle City Light/Seattle Public Utilities	1A	175,000	225	5/11/2011
Mud Mountain Dam	PI 10-300	Pierce	Federal	USACE	1A	156,000	425	NONE
Howard A. Hanson	KI 09-298	King	Federal	USACE	1A	136,700	235	NONE
Youngs Lake Outlet Dam	KI9-254	King	Public	Seattle Public Utilities	1A	18,908	30	NONE
Green Lake (Roosevelt) Reservoir	KI 08-0212	King	Public	Seattle Public Utilities	1A	181	25	NONE
Issaquah Highlands WSDOT Detention Pond Dam	KI 8-707	King	Public	City of Issaquah	1A	53	22	NONE
Madsen Creek West Basin Dam	KI 08-1862	King	Public	King County WLRD Stormwater Services Section	1A	27	6.5	NONE
Tapps Lake Dike No. 4	PI 10-296	Pierce	Private	Cascade Water Alliance	1B	58,340	45	NONE
Tapps Lake Dike No. 6	PI 10-423	Pierce	Private	Cascade Water Alliance	1B	43,000	26	NONE
Tapps Lake Dike No. 5	PI 10-422	Pierce	Private	Cascade Water Alliance	1B	40,000	24	NONE
Crystal Lake Dam	KI 08-0195	King	Private	Crystal Lake Inc.	1B	478	7	NONE

Table A-6. Dam EAPs Recommended for Conducting Tabletop Exercises (cont.)

Dam Name	State ID No.	County	Owner Type	Owner	Hazard Class	Max Storage (ac-ft)	Dam Height (ft)	Date of Last Tabletop Exercise
Panther Lake Detention Dam	KI10-1733	King	Private	Federal Way National Little League	1B	339	12	NONE
Welcome Lake Dam	KI 08-0194	King	Private	Lake of the Woods HOA	1B	260	25	NONE
Lake Forest Park Reservoir	KI 08-217	King	Public	Seattle Public Utilities	1B	208	40	NONE
Panther Lake Ballfield Dam	KI10-1737	King	Private	Federal Way National Little League	1B	102	15	NONE
Bitter Lake Reservoir	KI 08-0213	King	Public	Seattle Public Utilities	1B	71	31	NONE
Issaquah Highlands Upper Reid Detention Pond Dam	KI 8-680	King	Public	City of Issaquah	1B	69	38	NONE
Volunteer Park Reservoir	KI 08-210	King	Public	Seattle Public Utilities	1B	69	42	NONE
Microsoft Issaquah Highlands SW Pond	KI 08-1917	King	Private	Microsoft Corporation	1B	43	20	NONE
Cedar Way Stormwater Detention Dam	SN 8-1404	Snohomish	Public	City of Mountlake Terrace	1B	40	30	NONE
Lakemont Detention Pond	KI 08-1651	King	Public	City of Bellevue	1B	30	13	NONE

Table A-6. Dam EAPs Recommended for Conducting Tabletop Exercises (cont.)

Dam Name	State ID No.	County	Owner Type	Owner	Hazard Class	Max Storage (ac-ft)	Dam Height (ft)	Date of Last Tabletop Exercise
Johnson Pond Dam	KI 08-1999	King	Public	King County WLRD	1B	25	15	NONE
High Point Stormwater Pond	KI 09-1869	King	Public	Seattle Housing Authority	1B	22	15.5	NONE
Panther Lk. First Ave. Detention Pond	KI10-1747	King	Private	Federal Way National Little League	1B	18	9	NONE
Newcastle Stormwater Pond 3 Dam	KI 08-1908	King	Public	City of Newcastle	1B	13	12	NONE
Tapps Lake Dike No. 11	PI 10-427	Pierce	Private	Cascade Water Alliance	1C	38,000	23	NONE
Tapps Lake Dike No. 3	PI 10-421	Pierce	Private	Cascade Water Alliance	1C	28,000	15	NONE
Youngs Lake New Inlet Dam	KI9-415	King	Public	Seattle Public Utilities	1C	16,838	25	NONE
Lake Margaret Dam	KI 07-236	King	Private	Lake Margaret Community Purposes Club	1C	1,200	39	NONE
Lake Marcel Dam	KI 07-0200	King	Private	Lake Marcel Community Club	1C	350	24	NONE
Tuck Lake Dam	K107-180	King	Private	Lake Tuck HOA	1C	290	51	NONE
Port of Seattle, Industrial Wastewater Lagoon #3	KI 9-671	King	Public	Port of Seattle	1C	256	31.5	NONE

Table A-6. Dam EAPs Recommended for Conducting Tabletop Exercises (cont.)

Dam Name	State ID No.	County	Owner Type	Owner	Hazard Class	Max Storage (ac-ft)	Dam Height (ft)	Date of Last Tabletop Exercise
Kayak Lake Dam	SN 07-0199	Snohomish	Private	Mountain View Community Club	1C	230	28	NONE
Yellow Lake Dam	KI 08-559	King	Public	King County WLRD Stormwater Services Section	1C	220	14	NONE
Icon Materials Auburn Sediment Pond	KI 10-683	King	Private	Icon Materials	1C	200	120	NONE
Redmond Ridge Drive EC 4N Roadway Dam	KI 08-1837	King	Public	King County WLRD	1C	148	7	NONE
Upper Mill Creek Stormwater Detention Dam	KI 09-0582	King	Public	City of Kent	1C	100	14	NONE
Issaquah Highlands South Detention Pond Dam	KI 08-0688	King	Public	City of Issaquah	1C	68	27	NONE
Redmond Ridge Cedar Dam	KI 08-1802	King	Public	City of Redmond	1C	62	26	NONE
Trossachs Detention Facility PC-2	KI 07-1833	King	Public	City of Sammamish	1C	55	17	NONE
Genesee Detention Dam	KI 09-380	King	Public	City of Seattle Parks Dept	1C	52	32	NONE
Redmond Ridge East SRN2 Dam	KI 07-1892	King	Private	Redmond Ridge East LLC	1C	52	13.5	NONE

Table A-6. Dam EAPs Recommended for Conducting Tabletop Exercises (cont.)

Dam Name	State ID No.	County	Owner Type	Owner	Hazard Class	Max Storage (ac-ft)	Dam Height (ft)	Date of Last Tabletop Exercise
South 336th St. Stormwater Det. Pond	KI 10-1767	King	Private	Federal Way National Little League	1C	49	19	NONE
Kitts Corner Det. Pond	KI 10-1754	King	Private	Federal Way National Little League	1C	46	12	NONE
Redmond Ridge East Pond SRS 1 No. 1	KI 07-1922	King	Private	Redmond Ridge East LLC	1C	39	10	NONE
Silver Firs Detention Pond No. 3	SN 08-1792	Snohomish	Private	Silver Firs Community Association	1C	36	14	NONE
Issaquah Highlands NPE Pond Dam	KI 08-1867	King	Public	City of Issaquah	1C	36	23	NONE
Sea-Tac Airport Pond M	KI 09-2038	King	Public	Port of Seattle	1C	27	11	NONE
South Ridge Stormwater Detention Dam	KI 08-1820	King	Private	Agynbyte LLC	1C	25	10	NONE
Issaquah Highlands NP2 Det. Pond Dam	KI 08-1858	King	Public	City of Issaquah	1C	24	28	NONE
Mill Creek Canyon Stormwater Detention Dam	KI 09-1443	King	Public	City of Kent	1C	18	15	NONE
Snoqualmie Ridge Douglas Ave. Pond D1 Dam	KI 07-1804	King	Public	City of Snoqualmie	1C	18	10	NONE

Table A-6. Dam EAPs Recommended for Conducting Tabletop Exercises (cont.)

Dam Name	State ID No.	County	Owner Type	Owner	Hazard Class	Max Storage (ac-ft)	Dam Height (ft)	Date of Last Tabletop Exercise
Trossachs Pond PC-3	KI 07-1787	King	Public	City of Sammamish	1C	18	15	NONE
Mill Pond Dam	KI 10-1716	King	Public	City of Auburn	1C	16	10	NONE
Shoreview Park North Pond Dam Embankment	KI 08-1782	King	Public	City of Shoreline	1C	14	41	NONE
369th St. Detention Pond	KI 110-1811	King	Private	Enchanted Parks	1C	Unknown	17.8	NONE
Corliss Enumclaw Gravel Pit	NONE	King	Private	Corliss Resources Inc.	1C	Unknown	8	NONE
Tapps Lake Dike No. 8	PI 10-424	Pierce	Private	Cascade Water Alliance	2	34,000	20	NONE
Tapps Lake Dike No. 10	PI 10-426	Pierce	Private	Cascade Water Alliance	2	32,000	19	NONE
Tapps Lake Dike No. 2B	PI 10-420	Pierce	Private	Cascade Water Alliance	2	28,000	16	NONE
Tapps Lake Dike No. 9	PI 10-425	Pierce	Private	Cascade Water Alliance	2	26,000	15	NONE
Tapps Lake Dike No. 12	PI 10-428	Pierce	Private	Cascade Water Alliance	2	25,000	14	NONE
Tapps Lake Dike No. 1	PI 10-418	Pierce	Private	Cascade Water Alliance	2	22,000	18	NONE
Tapps Lake Dike No. 2A	PI 10-419	Pierce	Private	Cascade Water Alliance	2	20,000	9	NONE
Youngs Lake Cascades Dam	KI9-209	King	Public	Seattle Public Utilities	2	12,320	16	NONE

Table A-6. Dam EAPs Recommended for Conducting Tabletop Exercises (cont.)

Dam Name	State ID No.	County	Owner Type	Owner	Hazard Class	Max Storage (ac-ft)	Dam Height (ft)	Date of Last Tabletop Exercise
Tapps Lake Dike No. 13	PI 10-429	Pierce	Private	Cascade Water Alliance	2	10,000	6	NONE
Newcastle Railroad Embankment Dam	KI 08-0648	King	Public	Seattle City Light	2	200	60	NONE
Des Moines Ck Reg Det Pond West Berm	KI 09-692	King	Public	Des Moines Creek Basin Committee	2	160	14	NONE
Lake Kittyprince Dam	KI 07-0201	King	Public	WA DNR	2	96	15	NONE
Klahanie Dam No. 13	KI 08-0602	King	Public	City of Sammamish	2	56	13	NONE
Garrison Creek Dam	KI 09-650	King	Public	City of Kent Public Works	2	40	45	NONE
Des Moines Ck Reg Det Facility East Berm	KI 09-693	King	Public	Des Moines Creek Basin Committee	2	31	14	NONE
Klahanie Dam No. 1	KI 08-1484	King	Public	City of Sammamish	2	28	10	NONE
SeaTac Airport Pond G	KI 09-1972	King	Public	Port of Seattle	2	27	10.5	NONE
Des Moines Creek Stormwater Detention	KI 09-1649	King	Public	Port of Seattle	2	23	18	NONE
Boeing Creek M1 Dam	KI 08-0483	King	Public	City of Shoreline	2	14	36	NONE
Quadrant Corp. Parcel 1-East Pond	KI 10-1815	King	Public	King County	2	13	10	NONE
Lakeland South Pond No. 1	PI 10-1845	Pierce	Public	City of Auburn	2	12	13	NONE

APPENDIX B

Evacuation Plans Assessment Tool

TABLE OF CONTENTS

1.	The Baseline Standards and Guidance	B-1
2.	The customized crosswalk specifically includes the additional guidance	B-1
3.	How to read this crosswalk	B-1

LIST OF TABLES

Table B-1. Evacuation Plans Assessment Crosswalk	B-3
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EVACUATION PLANS ASSESSMENT TOOL

1. THE BASELINE STANDARDS AND GUIDANCE

- NFPA 1600 Standards on Disaster/Emergency Management and Business Continuity, 2016 edition
- National Response Framework (NRF), 2nd Edition, 2013
- National Incident Management System (NIMS)
- Homeland Security Exercise Evaluation Program (HSEEP), 2013

2. THE CUSTOMIZED CROSSWALK SPECIFICALLY INCLUDES THE ADDITIONAL STANDARDS

- Emergency Management Accreditation Program (EMAP) Emergency Management Standards, 2016
- FEMA Comprehensive Preparedness Guide (CPG) 101, v2.0, 2010
- National Response Framework, Mass Evacuation Incident Annex, 2008
- Planning Considerations for Host Communities and Reentry in the Puget Sound Region, 2012
- Regional Catastrophic Disaster Coordination Plan, Puget Sound Sheltering Annex - Training, Exercise and Evaluation Chapter, 2013
- FEMA Evacuee Support Planning Guide, 2009
- A Guide to Public Alerts and Warnings for Dam and Levee Emergencies. Mileti, Dennis. S., and John H. Sorensen (2015).

3. HOW TO READ THIS CROSSWALK

- Planning Requirements/Elements: lists the requirement or guidance that the plan is being assessed against – these include a standard, qualification, functional requirement, or ideal/best practice listed in the federal, state, and local guidance.

- **Standard:** lists the location in the source document (ex: CPG 101, EMAP, etc) of the standard, requirement, or qualification.
- **Score:** evaluation for each Planning Requirement against the associated Standard. “N” represents “needs improvement” for that requirement, “P” represents a “partially meets”, and “S” represents a “satisfactory” for that requirement.
- **Location In:** lists the location/reference in the plan that the requirement is met.
- **Findings:** lists the assessment team’s findings and the rationale. This column can indicate suggestions for improvement and/or the specific reason the assessment team felt the requirement was not met or only partially met. If the requirement was met, it can list how the requirement was met and best practices that are included in the plan.

Table B-1. Evacuation Plans Assessment Crosswalk

Planning Requirements / Elements	Standard	Score			Location in Evacuation Annex	Findings
		N	P	S		
Promulgation Document/Signature Page						
Signed statement formally recognizing and adopting the plan as the jurisdiction’s Evacuation plan; Signed by the jurisdiction’s senior elected or appointed official(s)	Comprehensive Preparedness Guide (CPG) 101 version 2.0, p. C-5; National Response Framework (NRF), p. 11			X	Evacuation Annex p. 15; CEMP p. 3	Agency rep signature in Annex. Also, formal promulgation statement in CEMP.
Provides evidence that the assigned emergency agencies are in agreement with how the plan describes their tasks. This may be in the form of a letter of concurrence or a sign-off sheet	None – this is a legacy practice unless made a local requirement		X		Not Identified	Agencies listed but no statement of concurrence in Annex or CEMP.
Approval and Implementation						
Introduces the plan, outlines its applicability, and indicates that it supersedes all previous plans	CPG 101 p. C-5			X	CEMP p. 3	No language in Annex re superseding. CEMP contains broad language.

Table B-1. Evacuation Plans Assessment Tool (cont.)

Planning Requirements / Elements	Standard	Score			Location in Evacuation Annex	Findings
		N	P	S		
Promulgation Document/Signature Page						
Includes a delegation of authority for specific modifications that can be made to the plan and by whom they can be made without the senior official’s signature	CPG 101 p. C-5			X	CEMP p. 52	CEMP language authorizes Annex revisions.
Authorities and References						
Identifies/describes the local, state, and federal laws that specifically apply to the development and implementation of the Evacuation plans, including (but not limited to) the following:						
Relevant local, regional and state ordinances and statutes	CPG 101 p. C-12; Emergency Management Accreditation Program (EMAP) Emergency Management Standards, 4.4.2			X	pp. 14-15; Comprehensive Emergency Management Plan (CEMP) pp. 68-75	Cited County Code 12.52, RCW 38.52, Regional Coordination Framework, UASI Evacuation Template. Scope of Annex limited to authority provided under County Code 12.52.
State Attorney General opinions	CPG 101 p. C-12; EMAP 4.4.2	X			Not identified	

Table B-1. Evacuation Plans Assessment Tool (cont.)

Planning Requirements / Elements	Standard	Score			Location in Evacuation Annex	Findings
		N	P	S		
Federal regulations and standards (e.g., Stafford Act, FEMA Policy, Patriot Act, Americans with Disabilities Act)	CPG 101 p. C-12; EMAP 4.4.2			X	p. 6 and 14; CEMP pp. 68-75	Partially summarized.
Identifies and defines terms, phrases, acronyms and abbreviations that have special meaning with regard to Evacuation functions and are used repeatedly in the plans	CPG 101 p. C-12;		X		p. 15	Only acronyms listed; no definitions for Evacuation terms (ex. mandatory). Rec: expand glossary for larger audience
Identifies how the plan complies with applicable legislation, regulations, directives and policies.	National Fire Protection Association Standard 1600 (NFPA) Ch.6.1.2		X		pp. 5-6 and 14-15	Cites references but does not indicate how plan is compliant.
Record of Changes						
Table with fields showing (at minimum) a change number, the date of the change, and the name of the person who made the change; other relevant information should be considered	CPG 101 p. C-5			X	CEMP p. 5	No change section in Annex; complete section in CEMP.
Includes documentation on established and maintains a process for identifying and addressing proposed legislative and regulatory changes	EMAP 4.4.2, 4.4.9	X			Not Identified	
Record of Distribution						

Table B-1. Evacuation Plans Assessment Tool (cont.)

Planning Requirements / Elements	Standard	Score			Location in Evacuation Annex	Findings
		N	P	S		
Table with fields that indicate the title and the name of the person receiving the plan, the agency to which the receiver belongs, the date of delivery, and the number of copies delivered	CPG 101 p. C-5	X			Not Identified	No distribution record in Annex; CEMP lists planned distribution only.
Table of Contents						
Outline of the plan's format, key sections, attachments, charts, etc.; List/identify the major sections/chapters and/or key element within the plan	CPG 101 p. C-5; EMAP 4.6.2		X		Not Identified	No TOC in Annex as it is a relatively small document
Purpose, Scope, Situation, Assumptions						
Purpose: Describes purpose for developing and maintaining the plan (e.g., coordinate local agency SOPs, define disaster-specific procedures, outline roles and limitations)	CPG 101 p. C-5; EMAP 4.4.2			X	p. 1	Well developed.
Scope: Describes at what times or under what conditions this plan would be activated (e.g., major disaster versus minor emergency, major statewide disaster, terrorist attack within a city, the County, or the State). Relationship to other County plans (ex. dam Emergency Action Plans (EAPs))	CPG 101 p. C-6; EMAP 4.4.2; NRF p. 22			X	p. 1	Current language addresses responsibilities and defines evacuation functions; no activation threshold. Scope utilizes the term "may" in defining evacuation activities. Intended to indicate that the role may not be required in each event but indirectly makes these activities appear to be optional.
Situation: Provides a brief overview of the situation and steps taken by the jurisdiction to prepare for disasters	CPG 101 p. C-6 - C-7			X	p. 2	Good Situation summary. Preparedness efforts discussed under Concept of Operations.

Table B-1. Evacuation Plans Assessment Tool (cont.)

Planning Requirements / Elements	Standard	Score			Location in Evacuation Annex	Findings
		N	P	S		
Planning Assumptions: Identifies what the planning team deems to be facts for the planning purposes in order to make it possible to execute the plan	CPG 101 p. C-7; EMAP 4.6.2; NFPA, Ch. 6.1.2 (1) and App A.5.2.2.1(4)(k)			X	pp. 4-5; CEMP pp. 14-15	Good set of planning assumptions. Annex also includes a “Policies” section detailing key authorities and limits to Annex functions.
Hazard Analysis Summary (Dam Safety)						
See Mass Care & Shelter Plans Assessment Crosswalk						
Capability Assessment						
Summarizes the jurisdiction’s prevention, protection, response and recovery capabilities involving the defined hazards	CPG 101 p. C-7	X			CEMP p. 13	CEMP indicates capability assessments to be conducted every 5 years – published separately from CEMP.
Describes the jurisdiction’s Evacuation capabilities/limitations on the basis of training, equipment or personnel	CPG 101 p. C-7	X			Not Identified	No estimate of potential demand vs. available resources i.e. worst-case scenario (number to be evacuated, number requiring assistance, traffic restrictions, etc. Rec: Consider conducting a formal evacuation capabilities assessment to identify potential resource shortfalls.

Table B-1. Evacuation Plans Assessment Tool (cont.)

Planning Requirements / Elements	Standard	Score			Location in Evacuation Annex	Findings
		N	P	S		
Describe the methods used and agencies involved in a formal capability assessment, including how often to conduct the assessment		X			Not Identified	Rec: Consider conducting a formal evacuation capabilities assessment to identify potential resource shortfalls.
Mitigation Overview						
See Mass Care & Shelter Plans Assessment Crosswalk						
Concept of Operations						
Describes who has the authority to activate the plan (e.g., EMA office, Chief Elected Official, State Official, Fire/Police Chief)	CPG 101 p. C-7; NFPA Ch. 6.1			X	p. 6	King County Sheriff's Office is lead agency for unincorporated county areas and contracted cities. RCECC will assist.
Describes the process, templates and individuals involved in issuing a declaration of emergency for a given hazard and how the declaration will be coordinated with neighboring jurisdictions and the State	CPG 101 p. C-7; EMAP 4.5.1			X	p. 9	IC may request warning and evacuation support without local emergency proclamation. CEMP outlines authority to proclaim a local emergency.
Describes how legal questions/issues are resolved as a result of preparedness, response or recovery actions, including what liability protection is available to responders	CPG 101 p. C-7;	X			Not identified	Rec: Consider question of mandatory vs. voluntary evacuation

Table B-1. Evacuation Plans Assessment Tool (cont.)

Planning Requirements / Elements	Standard	Score			Location in Evacuation Annex	Findings
		N	P	S		
Describes the process by which the EM office coordinates with all appropriate agencies, boards or divisions within the jurisdiction	CPG 101 p. C-7;			X	p. 11	Support functions including JIC, warning, locating safe areas, routes, care & shelter, accounting for evacuees, resource coordination, evacuee return, situational awareness, and coordination with the state.
Whole Community						

Table B-1. Evacuation Plans Assessment Tool (cont.)

Planning Requirements / Elements	Standard	Score			Location in Evacuation Annex	Findings
		N	P	S		
Describe how plans take into account the physical, programmatic, and communications needs of individuals with disabilities and others with access and functional needs (AFN). Including: • Documentation of AFN representation involved in plan preparation and review • Use of and adaptation of public warning systems and techniques that meet ADA requirements • Program accessibility (e.g., translation and interpreter services, personal assistance, accommodation for durable medical equipment, etc.) to ensure that all residents have access to all services provided including providing support for persons that may rely on durable medical equipment (DME) • Analysis of jurisdictional demographic data to identify AFN populations that may require shelter • Methods to identify AFN populations that may require transportation assistance, and means to provide such assistance	CPG 101, pp. 1-2, and 4-4, C-7, and Appendix D1; NFPA, Annex J;	X			pp. 2, 4, 8-9, 14	• General policy references to ADA compliance, and AFN populations; no specific procedures or protocols • No documentation of AFN reps in preparation of CEMP or Annex • No reference to list of ADA-compliant warning systems or techniques • No detail regarding program accessibility (e.g., translation, DME) • No analysis of AFN demographic data (RHMP Ch. 9 briefly mentions but does not provide estimates of vulnerable pops) • No method for identifying AFN populations that may need transportation Rec: consider CEMP and Annex revisions to incorporate additional AFN guidance and tools.
Identify and describe the actions that will be taken to coordinate evacuations and sheltering-in-place for all segments of the population, including children, individuals with disabilities, and others with access and functional needs.	CPG 101 p. C-24 and Appendix D1	X			Not identified	Rec: Consider CEMP and Annex revisions to incorporate additional guidance regarding procedures and tools for addressing needs of children.

Table B-1. Evacuation Plans Assessment Tool (cont.)

Planning Requirements / Elements	Standard	Score			Location in Evacuation Annex	Findings
		N	P	S		
Identify and describe the actions that will be taken to perform advanced/early evacuation, which is often necessary to accommodate children and others with mobility issues. Identify and describe the actions that will be taken to provide safe evacuation/transportation assistance to unaccompanied minors. Describe the methods used to keep children and others with disabilities with their caregivers, mobility devices, other durable medical equipment, and/or service animals during an evacuation.	CPG 101 p. C-24	X			Not identified	Rec: Consider CEMP and Annex revisions to incorporate additional guidance regarding procedures and tools for addressing needs of children and others requiring caregivers or other assistance during an evacuation. Consider participation in the National Mass Evacuation Tracking System.
Describes the methods of securing and transporting household pets, service animals and livestock during evacuations	CPG 101 pp. C-7, C-18, 4-22 thru 4-24 and B10;	X			Not identified	Rec: Consider CEMP and Annex revisions to incorporate additional guidance regarding animal evacuation procedures and tools (ex. certain animals are allowed on public transportation if contained).
Identifies other response/support agency plans that directly support the implementation of this plan (e.g., transportation, facility plans)	CPG 101 p. C-7		X		p. 7	References Green River Flood Event IAP and Evacuation Timeline and County facility evacuation plans – not evaluated here.
Organization and Assignment of Responsibilities						
Identifies/outlines the responsibilities assigned to each organization that has a mission assignment defined in the Annex, including (but not limited to) the following:						

Table B-1. Evacuation Plans Assessment Tool (cont.)

Planning Requirements / Elements	Standard	Score			Location in Evacuation Annex	Findings
		N	P	S		
Local senior elected or appointed officials (e.g., Governor, Mayor, Commissioner, Administrative Judge, Council, Executive Director)	CPG 101 p. C-8			X	p. 11	County Executive roles identified. Additional general duties outlined in CEMP.
Local department and agencies (e.g., Fire, Law Enforcement, EMS, Health, EMA, social services, animal control)	CPG 101 p. C-8			X	pp. 10-13	County Sheriff as lead agency. County departments, 911 PSAPs, local municipalities, special districts, hospitals as support agencies. No Animal Control. Lists of key responsibilities. However, indicates agency “may” conduct listed actions.
State agencies most often and/or likely to be used to support Evacuation operations (e.g., States’ Department of Transportation, State Police/Highway Patrol, Department of Natural Resources [DNR], Environmental Protection/Quality, Emergency Management, Homeland Security, Department of Health/Public Health, and National Guard)	CPG 101 p. C-8			X	p. 13	State Transportation Dept, State Emergency Management Division, State Patrol, State Dept. of Health. Lists of key responsibilities. However, indicates agency “may” conduct listed actions.
Regional organizations or groups most often and/or likely to be used to support Evacuation operations	CPG 101 p. C-8	X			Not identified	

Table B-1. Evacuation Plans Assessment Tool (cont.)

Planning Requirements / Elements	Standard	Score			Location in Evacuation Annex	Findings
		N	P	S		
Federal agencies most often and/or likely to be used to support Evacuation operations (e.g., FEMA, U.S. Coast Guard, DOJ, FBI, Federal Aviation Administration [FAA], National Safety Transportation Board [NTSB], DoD, DOT, USDA)	CPG 101 p. C-8		X		p. 13	Only US Coast Guard listed.
Government-sponsored volunteer resources (e.g., CERTs, Medical Reserve Corps [MRC], Volunteers in Police Service [VIPS] or Auxiliary Police)	CPG 101 p. C-8	X			Not identified	Rec: evaluate the potential for integrating volunteer organization resources into evacuation function.
Private and voluntary organizations (e.g., organizations that assist with sheltering, feeding, services for persons with disabilities, animal response, social services, health-related needs, community and faith-based organizations, animal welfare and/or humane organizations, independent living centers, disability advocacy groups, business and industry participation)	CPG 101 p. C-8			X	p. 14	ARC, Salvation Army. Lists of key responsibilities. However, indicates agency “may” conduct listed actions.
Describes how roles and responsibilities will be determined for unaffiliated (emergent) volunteers and how to incorporate these individuals into the Evacuation operation.	CPG 101 p. C-8	X			Not identified	CEMP references Volunteer Management Annex – not evaluated here.
Identifies agency roles and responsibilities for Evacuation, including an emergency organization chart.	CPG 101 p. C-9, EMAP 4.6.6		X		pp. 10-14	No org chart specific to the evacuation function in Annex.

Table B-1. Evacuation Plans Assessment Tool (cont.)

Planning Requirements / Elements	Standard	Score			Location in Evacuation Annex	Findings
		N	P	S		
Includes a list of agencies and personnel not internal to the organization but critical to emergency Evacuation operations			X		p. 14	“Other Agencies and Entities” may register volunteers. But no specific roles for evacuation support.
Mutual Aid, contract and other agreements						
Agreements for additional Evacuation resources/assistance between neighboring jurisdictions’ response forces (e.g., fire, police, EMS)	CPG 101 p. C-8; EMAP 4.8 & 4.9	X			p. 7	KCOEM to lead development of all agreements – not evaluated here.
MOUs or other forms of agreement with transportation owner/operators (not including regularly scheduled public transit)		X			p. 7	KCOEM to lead development of all MOUs – not evaluated here.
Evacuation agreements (e.g., use of buildings, restaurants, homes as shelters/lodging, relocation centers; transportation support), including agreements between jurisdictions for the acceptance of evacuees	CPG 101 p. C-9 EMAP 4.8.1	X			p. 7	KCOEM to lead development of all agreements – not evaluated here.
Describes how the jurisdiction maintains a current list of available NIMS Typed Evacuation Resources and Credentialed Personnel	CPG 101 p. C-9, EMAP 4.7	X			Not identified	
Describes how all tasked organizations maintain current notification rosters, SOPs/SOGs and checklists to carry out their assigned tasks	CPG 101 p. C-9, EMAP 4.6.5 & 4.7.4	X			Not identified	

Table B-1. Evacuation Plans Assessment Tool (cont.)

Planning Requirements / Elements	Standard	Score			Location in Evacuation Annex	Findings
		N	P	S		
Describes the jurisdiction's policies regarding public safety enforcement actions required to maintain the public order during Evacuation operations	CPG 101 p. C-9			X	pp. 8-10	Local law enforcement to support safe area security, road closures, and shelters and/or participate in task forces to direct traffic, and manage collisions or driver altercations.
Direction, Control, and Coordination						
Identifies who has tactical and operational control of Evacuation response assets	CPG 101 p. C-9; NFPA 1600, Ch. 6.7			X	p. 9	IC, UC, or ECC/EOC. KCSO as task force lead in ECC
Discusses multijurisdictional coordination systems and process used during Evacuation operations	CPG 101 p. C-9			X	pp. 5-10	Detailed Concept of Operations. However, the 6 phases of evacuation are embedded in the detail. Rec: consider revising Evacuation Annex and organize Concept of Operations by phase.
Indicates how the EOC will coordinate and communicate with field units, cities, special districts, and other entities for Evacuation			X		p. 9	Not clearly defined. Rec: consider revising Evacuation Annex and clarifying role of RCECC and communications methods (ex. RCECC and ICPs and Evac Sites). Consider diagramming potential agency/organization relationships. Consider identifying RCECC position(s) responsible for this function and add to position checklists.
Information Collection and Dissemination						

Table B-1. Evacuation Plans Assessment Tool (cont.)

Planning Requirements / Elements	Standard	Score			Location in Evacuation Annex	Findings
		N	P	S		
Describes critical information needs and collection priorities for Evacuation functions	CPG 101 p. C-9		X		Not identified	CEMP: general discussion of Situation Awareness and process however, no Evacuation-specific Essential Elements of Information (EEIs). Rec: Consider incorporating specific EEIs into revised Annex.
Describes the method in which situation status and analysis for Evacuation operations will be captured and reported to all coordinating agencies	CPG 101 p. C-9		X		Not identified	Rec: Consider diagramming potential agency/organization relationships.
Communications						
Describes the framework for delivering communications support and how the jurisdiction's communications integrate into the regional or national disaster communications network	CPG 101 p. C-9, EMAP 4.10.1; NFPA 1600, Ch. 6.5		X			CEMP: ESF 2 document – not evaluated here
Identifies and summarizes separate interoperable communications plans specific to Evacuation functions (ex. communication with Evacuation Task Forces or Evacuation Centers outside the County)	CPG 101 p. C-9		X			CEMP: ESF 2 document – not evaluated here
Functions (Management, Operations, Planning/Intelligence, Logistics, Finance/Administration)						
Management						

Table B-1. Evacuation Plans Assessment Tool (cont.)

Planning Requirements / Elements	Standard	Score			Location in Evacuation Annex	Findings
		N	P	S		
Indicates how the jurisdiction fulfills the management functions and responsibilities including: • Overall Evacuation function management • Public Information assignment • Identification of a media center • Rumor control • Public inquires • Provision for public safety communications and policy • Identification of a Safety Officer • Agency liaison • State/federal field activity coordination	NFPA 1600, Ch. 6.6			X	pp. 3-14	• KCSO as lead agency. However, County Executive may also order evacuations. • Fire service agencies may support w/ PIOs. However, public information function lead agency not identified. • Annex indicates that the County “may” assemble an Evacuation Task Force. • No lead Safety Officer identified. • KCOEM or RCECC to coordinate with state/feds.
Describe how and when the public is notified (including individuals with sensory disabilities and individuals with limited English proficiency), explaining the actions they may be advised to follow during an evacuation, while sheltering-in-place, upon the decision to terminate sheltering-in-place, and throughout the incident.	CPG 101, p. C-24	X			Not identified	

Table B-1. Evacuation Plans Assessment Tool (cont.)

Planning Requirements / Elements	Standard	Score			Location in Evacuation Annex	Findings
		N	P	S		
Describe how agencies coordinate the decision to return evacuees to their homes, including informing evacuees about any health or physical access concerns or actions they should take when returning to homes/businesses. Identify and describe the actions that will be taken to identify and assist the return of evacuees to their homes/communities, including individuals with disabilities and others with access and functional needs.	CPG 101, p. C-25		X		p. 9-10	“Return of Displaced Population” is an incomplete section. Concept of Operations, Possible Sequence of Evacuation Actions includes good practices including clearing hazards, and phased return to avoid traffic congestion. Rec: Consider identifying specific agency coordinator and authority to make decision to re-enter. Identify re-entry options and potential control measures (ex. residents only w/ ID) See also “Planning Considerations for Host Communities and Reentry in the Puget Sound Region.”
Identify and describe the actions that will be taken when the general public refuses to evacuate (e.g., implement forced removal, contact next of kin, place unique markings on homes, take no action).	CPG 101, p. C-25	X			Not identified	Rec: Consider clarifying authorities to order and enforce mandatory evacuations.
Operations						
Indicates how the jurisdiction fulfills the Operations functions and responsibilities including: - Emergency food and water distribution - Emergency roadside assistance - Emergency fuel - Transportation of pets and livestock	CPG 101, pp. C-17-19		X		pp. 8-9	Potential use of Traffic Task Forces.

Table B-1. Evacuation Plans Assessment Tool (cont.)

Planning Requirements / Elements	Standard	Score			Location in Evacuation Annex	Findings
		N	P	S		
Identifies and describes the actions that will be taken to identify, open, and staff emergency evacuation reception centers.	CPG 101 p. C-17	X			p. 9	ARC and other NGOs support in Phase 5 (Reception and Recovery)
Describes the agencies and methods used to provide evacuation of institutionalized populations (e.g., long-term care and assisted living facilities, group homes), individuals with disabilities, and others with access and functional needs (e.g., medical and prescription support, personal assistance services, durable medical equipment, consumable medical supplies, childcare, transportation [including accessible transportation], foreign language interpreters), including their caregivers.	CPG 101 p. C-17		X		Not identified	Rec: Review FEMA guidance for evacuation of AFN populations and consider revising service delivery model.
Logistics						
Indicates how the jurisdiction fulfills the Logistics functions and responsibilities including: • Field incident support • Communications support • Transportation support • Personnel • Supply and procurement • Resource tracking • Sanitation services • Computer support	CPG 101, p. C-11		X		Not identified	CEMP: KCECC Logistics Section

Table B-1. Evacuation Plans Assessment Tool (cont.)

Planning Requirements / Elements	Standard	Score			Location in Evacuation Annex	Findings
		N	P	S		
Describes how resources are mobilized and managed. Includes methods to contact emergency response personnel during normal and after-hours. This may be in the form of an alert list				X	Not Identified	CEMP: KCOEM Duty Officer
Identifies and describes the actions that will be taken to ensure the availability of sufficient and timely accessible transportation to evacuate children and other individuals with access and functional needs whose families do not have their own transportation resources. Describes the means and methods by which evacuation transportation requests from schools, individuals with disabilities, and others with access and functional needs are collected and consolidated. Describes the means by which incoming transportation requests will be tracked, recorded, and monitored as they are fulfilled. Describes how accessible transportation resources (including paratransit service vehicles, school buses, municipal surface transit vehicles, drivers, and/or trained attendants) that can provide needed services during an evacuation are identified.	CPG 101 p. C-25	X			Not identified	Rec: Consider conducting a formal evacuation transportation capabilities assessment and detail accessible transportation assets, shortfalls and mobilization procedures/agreements.

Table B-1. Evacuation Plans Assessment Tool (cont.)

Planning Requirements / Elements	Standard	Score			Location in Evacuation Annex	Findings
		N	P	S		
Describes/identifies the steps taken to overcome the jurisdiction's identified resource shortfalls, including identifying the resources that are only available outside the jurisdiction (e.g. evacuation airlift) and the process to request those resources	CPG 101 p. C-11	X			Not identified	Rec: Consider conducting a formal gap analysis of evacuation capabilities relative to a worst case dam failure scenario.
Identifies sources, duties and organization of evacuation support staff including: • Source of staff for initial warning • Source of staff for subsequent operational periods • Categories, number, and organization of staff for Traffic Task Forces • Description of duties by position (e.g., position checklist or job description) • Just-in-Time (JIT) materials if staff are not pre-trained • Policies and procedures for using residents or other volunteers to assist in performance of evacuation support functions					Not identified	Rec: Identify categories and quantity of staff needed to support all Evacuation operations as part of formal Evacuation Capability Assessment. Rec: Select an operational standard and encourage training and exercises to that standard for all jurisdictions in the County.
Plan Development and Maintenance						
Describe how these Evacuation plans were coordinated with the relevant plans from adjoining/intra-State Regional jurisdictions to include Local political subdivisions	CPG 101 p. C-11; NFPA 1600, Ch. 6.3		X		p. 7	Green River plans. No relationship indicated to Puget Sound Regional Evacuation Plan.
Describe the process used to review and revise the plan each year or — if changes in the jurisdiction warrant (e.g., changes in administration or procedures, newly added resources/training, revised phone contacts or numbers) — more often	CPG 101 p. C-11; EMAP 4.8.3,		X		p. 2	KCSO is lead agency for planning effort. Rec: Clarify if KCSO or KCOEM will update this Annex.

Table B-1. Evacuation Plans Assessment Tool (cont.)

Planning Requirements / Elements	Standard	Score			Location in Evacuation Annex	Findings
		N	P	S		
Describe/identify how or where the plan is made available to the public	CPG 101 p. C-11		X		Not identified	However, the document is posted on the County web site
Training and Exercises						
Describe the schedule for identifying and meeting training needs based on the expectations created by the plans; the process and schedule for developing, conducting, and evaluating exercises and correcting identified deficiencies	CPG 101 p. 3-10, and 4-25-4-26; NFPA, Chs. 7 and 8 and Appendix A		X		Not identified	Minimal training/exercise language in CEMP. Rec: Develop additional training and tabletop exercise events specific to Evacuation function tied to results of formal Evacuation Capabilities Assessment. Incorporate in multi-year TEP and assess as part of annual THIRA. See also “Puget Sound Sheltering Annex, Training, Exercise and Evaluation Chapter.”

APPENDIX C

Mass Care and Shelter Plans Assessment Tool

TABLE OF CONTENTS

1.	Baseline standards and guidance.....	C-1
2.	The customized crosswalk specifically includes the additional standards	C-1
3.	How to read this crosswalk	C-2

LIST OF TABLES

Table C-1. Mass Care and Shelter Plans Crosswalk.....	C-3
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MASS CARE AND SHELTER PLANS ASSESSMENT TOOL

1. BASELINE STANDARDS AND GUIDANCE

- NFPA 1600 Standards on Disaster/Emergency Management and Business Continuity, 2016 edition
- National Response Framework (NRF), 2nd Edition, 2013
- National Incident Management System (NIMS)
- Homeland Security Exercise Evaluation Program (HSEEP), 2013

2. THE CUSTOMIZED CROSSWALK SPECIFICALLY INCLUDES THE ADDITIONAL STANDARDS

- Emergency Management Accreditation Program (EMAP) Emergency Management Standards, 2016
- FEMA Comprehensive Preparedness Guide (CPG) 101, v2.0, 2010
- Emergency Support Function #6—Mass Care, Emergency Assistance, Temporary Housing, and Human Services Annex, 2016
- FEMA Guidance on Planning for Integration of Functional Needs Support Services in General Population Shelters, 2010
- Shelter Guidance Aid and Shelter Staffing Matrix, American Red Cross, 2010
- FEMA/ARC Shelter Field Guide, 2014
- Los Angeles Operational Area Mass Care Guidance for Emergency Planners, 2010
- Mega-Shelter Planning Guide: A Resource and Best Practices Reference Guide, International Association of Venue Managers Life Safety Council and the Academy for Venue Safety & Security, 2010

3. HOW TO READ THIS CROSSWALK

- **Planning Requirements/Elements:** lists the requirement or guidance that the plan is being assessed against – these include a standard, qualification, functional requirement, or ideal/best practice listed in the federal, state, and local guidance.
- **Standard:** lists the location in the source document (ex: CPG 101, EMAP, etc) of the standard, requirement, or qualification.
- **Score:** evaluation for each Planning Requirement against the associated Standard. “N” represents “needs improvement” for that requirement, “P” represents a “partially meets”, and “S” represents a “satisfactory” for that requirement.
- **Location In:** lists the location/reference in the plan that the requirement is met.
- **Findings:** lists the assessment team’s findings and the rationale. This column can indicate suggestions for improvement and/or the specific reason the assessment team felt the requirement was not met or only partially met. If the requirement was met, it can list how the requirement was met and best practices that are included in the plan.

Table C-1. Mass Care and Shelter Plans Crosswalk

Planning Requirements / Elements	Standard	Score			Location in ESF 6 Document	Findings
		N	P	S		
Promulgation Document/Signature Page						
Signed statement formally recognizing and adopting the plan as the jurisdiction’s Care and Shelter plan; Signed by the jurisdiction’s senior elected or appointed official(s)	Comprehensive Preparedness Guide (CPG) 101 version 2.0, p. C-5; National Response Framework (NRF), p. 11			X	ESF 6 document p. 12; CEMP p. 3	Agency rep signature in ESF 6 doc. Also, formal promulgation statement in CEMP.
Provides evidence that the assigned emergency agencies are in agreement with how the plan describes their tasks. This may be in the form of a letter of concurrence or a sign-off sheet	None – this is a legacy practice unless made a local requirement		X		Not Identified	Agencies listed but no statement of concurrence in ESF 6 doc or CEMP.
Approval and Implementation						
Introduces the plan, outlines its applicability, and indicates that it supersedes all previous plans	CPG 101 p. C-5			X	CEMP p. 3	No language in ESF 6 doc re superseding. CEMP contains broad language.

Table C-1. Mass Care and Shelter Plans Crosswalk (cont.)

Planning Requirements / Elements	Standard	Score			Location in ESF 6 Document	Findings
		N	P	S		
Includes a delegation of authority for specific modifications that can be made to the plan and by whom they can be made without the senior official's signature	CPG 101 p. C-5			X	CEMP p. 52	CEMP language authorizes ESF 6 doc revisions.
Authorities and References						
Identifies/describes the local, state, and federal laws that specifically apply to the development and implementation of the Care & Shelter plans, including (but not limited to) the following:						
Relevant local, regional and state ordinances and statutes	CPG 101 p. C-12; Emergency Management Accreditation Program (EMAP) Emergency Management Standards, 4.4.2			X	pp. 3 and 12; Comprehensive Emergency Management Plan (CEMP) pp. 68-75	Cited County Code 12.52, RCW 38.52 and WAC Title 118.
State Attorney General opinions	CPG 101 p. C-12; EMAP 4.4.2	X			Not identified	
Federal regulations and standards (e.g., Stafford Act, FEMA Policy, Patriot Act, Americans with Disabilities Act)	CPG 101 p. C-12; EMAP 4.4.2			X	pp. 3-4 and 12; CEMP pp. 68-75	Partially summarized; some references out of date (ex. FEMA PA Policy).

Table C-1. Mass Care and Shelter Plans Crosswalk (cont.)

Planning Requirements / Elements	Standard	Score			Location in ESF 6 Document	Findings
		N	P	S		
Identifies and defines terms, phrases, acronyms and abbreviations that have special meaning with regard to Care & Shelter functions and are used repeatedly in the plans	CPG 101 p. C-12;		X		p. 12	Only 3 acronyms listed; no definitions for C&S terms (ex. AFN, congregate). Rec: expand glossary for larger audience
Identifies how the plan complies with applicable legislation, regulations, directives and policies.	National Fire Protection Association Standard 1600 (NFPA) Ch.6.1.2		X		pp. 3-4 and 12	Cite references but does not indicate how plan is compliant.
Record of Changes						
Table with fields showing (at minimum) a change number, the date of the change, and the name of the person who made the change; other relevant information should be considered	CPG 101 p. C-5			X	CEMP p. 5	No change section in ESF 6 doc; complete section in CEMP.
Includes documentation on established and maintains a process for identifying and addressing proposed legislative and regulatory changes	EMAP 4.4.2, 4.4.9		X		p. 11	Identifies that plan will be updated every 4 years in conjunction with CEMP and after AARs.
Record of Distribution						
Table with fields that indicate the title and the name of the person receiving the plan, the agency to which the receiver belongs, the date of delivery, and the number of copies delivered	CPG 101 p. C-5	X			Not Identified	No distribution record in ESF 6 doc; CEMP lists planned distribution only.

Table C-1. Mass Care and Shelter Plans Crosswalk (cont.)

Planning Requirements / Elements		Standard	Score			Location in ESF 6 Document	Findings
			N	P	S		
	Table of Contents						
Outline of the plan’s format, key sections, attachments, charts, etc.; List/identify the major sections/chapters and/or key element within the plan		CPG 101 p. C-5; EMAP 4.6.2			X	Not Identified	No TOC in ESF 6 doc as it is a small document
Purpose, Scope, Situation, Assumptions							
Purpose: Describes purpose for developing and maintaining the plan (e.g., coordinate local agency SOPs, define disaster-specific procedures, outline roles and limitations)		CPG 101 p. C-5; EMAP 4.4.2		X		p. 1	ESF 6 doc language does not address purpose of the document itself rather than what ESF 6 is. Need to indicate relationship to CEMP and add roles from “Scope” section
Scope: Describes at what times or under what conditions this plan would be activated (e.g., major disaster versus minor emergency, major statewide disaster, terrorist attack within a city, the County, or the State). Relationship to other County plans (ex. dam Emergency Action Plans (EAPs))		CPG 101 p. C-6; EMAP 4.4.2; NRF p. 22		X		p. 1	Current language addresses responsibilities and defines mass care functions; no activation threshold Note: The ESF 6 doc is titled “Mass Care, Emergency Assistance, Housing, and Human Services” however, there is little content regarding emergency assistance and human services. There is reference to a ‘Post-Disaster Housing Plan’ not evaluated here. Rec: Consider revising ESF 6 doc to align with state ESF#6 scope and functions.

Table C-1. Mass Care and Shelter Plans Crosswalk (cont.)

Planning Requirements / Elements	Standard	Score			Location in ESF 6 Document	Findings
		N	P	S		
Situation: Provides a brief overview of the situation and steps taken by the jurisdiction to prepare for disasters	CPG 101 p. C-6 - C-7		X		p. 2	Current language is vague relative to ESF6 functions. Rec: Define ESF6 functions as per the CEMP as well as the potential scale of ESF6 mission
Planning Assumptions: Identifies what the planning team deems to be facts for the planning purposes in order to make it possible to execute the plan	CPG 101 p. C-7; EMAP 4.6.2; NFPA, Ch. 6.1.2 (1) and App A.5.2.2.1(4)(k)			X	p. 2; CEMP pp. 14-15	Number of good assumptions; could move #1 to CONOPS section
Hazard Analysis Summary (Dam Safety)						
Summarizes/identifies the hazards that pose a unique risk to the jurisdiction and would result in the need to activate this plan (e.g., threatened or actual disasters, acts of terrorism, hazmat releases, or other human-caused disasters)	CPG 101 p. C-6; NFPA, Ch. 5.2		X		CEMP p. 13	ESF 6 doc has no hazard analysis. CEMP briefly references HIRA but not the Regional Hazard Mitigation Plan (RHMP).

Table C-1. Mass Care and Shelter Plans Crosswalk (cont.)

Planning Requirements / Elements	Standard	Score			Location in ESF 6 Document	Findings
		N	P	S		
Summarizes/identifies the probable high-risk areas (population, infrastructure, and environmental) that are likely to be impacted by the defined hazard (e.g., special-needs facilities, wildlife refuges, types/numbers of homes/businesses in floodplains, areas around chemical facilities). Provides or references dam inundation maps that indicate what areas could flood, the time the flood wave arrives at specific locations and when the water will recede.	CPG 101 p. C-6; EMAP 4.1.1; NFPA, Ch. 5.2			X	RHMP Chs. 5.3.2 and 9	Per RMHP, dam failure potential rated as very low. Hazard classifications noted. Strong Level 2 Hazus analyses of dam failure threat for Class 1A dams at Tolt, Culmbach, and Lake Young's. However, no analyses for larger FERC-regulated dams. Omission implies that the larger dams are not Class 1A. No approximate dam failure inundation maps or impact times. Rec: Conduct similar analyses for larger dams across each potential impact element. Consider adding approx. dam inundation maps to provide visual indicator of potential effects.
Summarizes/identifies the likelihood that the defined hazard has occurred and will continue to occur within the jurisdiction (e.g., historical frequency, probable future risk, national security threat assessments)	CPG 101 p. C-6; EMAP 4.1.1; NFPA, Ch. 5.2			X	RHMP Chs. 9.2 and 9.8	Discussion of required use of probable maximum flood scenario although that is lowest probability
Describes how CIKR protection activities have been incorporated into the vulnerability and impact analysis	CPG 101 p. C-6; NFPA, Ch. 5.2		X		RHMP Ch. 9.4	Critical facilities listed for dams that were analyzed.

Table C-1. Mass Care and Shelter Plans Crosswalk (cont.)

Planning Requirements / Elements	Standard	Score			Location in ESF 6 Document	Findings
		N	P	S		
Describes the assumptions made and the methods used to complete the jurisdiction's Hazard Analysis, including what tools or methodologies were used to complete the analyses (e.g., a State's hazard Analysis and Risk Assessment Manual, Mitigation Plan guidance, vulnerability assessment criteria, consequence analysis criteria)	CPG 101 p. C-6;			X	RHMP Chs. 5.3.2 and 9	Hazus Level 2
References a Threat and Hazard Identification and Risk Assessment.	Optional (No regulatory standard for non-UASI, non-tribal local governments)			X	CEMP p. 13	CEMP references County HIRA.
Capability Assessment						
Summarizes the jurisdiction's prevention, protection, response and recovery capabilities involving the defined hazards	CPG 101 p. C-7	X			CEMP p. 13	CEMP indicates capability assessments to be conducted every 5 years – published separately from CEMP.
Describes the jurisdiction's Care & Shelter capabilities/limitations on the basis of training, equipment or personnel	CPG 101 p. C-7	X			Not Identified	No estimate of potential demand vs. available resources. Rec: consider conducting a formal shelter capabilities assessment to identify potential resource shortfalls (ex. SF UASI model).
Describes the methods used and agencies involved in a formal capability assessment, including how often to conduct the assessment		X			Not Identified	Rec: consider conducting a formal shelter capabilities assessment to identify potential resource shortfalls (ex. SF UASI model).

Table C-1. Mass Care and Shelter Plans Crosswalk (cont.)

Planning Requirements / Elements	Standard	Score			Location in ESF 6 Document	Findings
		N	P	S		
Mitigation Overview						
Describes the process and agencies used to develop Mitigation Plans and how these are coordinated with Local, State, Tribal and Federal agencies/plans	EMAP 4.11.1			X	RHMP Ch. 5	Strong process description in RHMP.
Provides a brief overview of the mitigation programs used locally to reduce the chance that a defined hazard will impact the community (e.g., move homes/businesses out of floodplain, establish and enforce zoning/building codes, install surveillance cameras, conduct cargo surveillance and screening), including short- and long-term strategies	EMAP 4.4.1 & 4.11.3; NFPA Ch. 6.3; 44 CFR			X		No summary in CEMP. Per RMHP, dam failure potential rated as very low. Strong Level 2 Hazus analyses of dam failure threat for Tolt, Culmback, and Lake Young’s. However, no analyses for larger FERC-regulated dams. Rec: conduct similar analyses for larger dams across each potential impact element. Add these dam failure threat summaries into CEMP.
Concept of Operations						
Describes who has the authority to activate the plan (e.g., EMA office, Chief Elected Official, State Official, Fire/Police Chief)	CPG 101 p. C-7; NFPA Ch. 6.1			X	CEMP, p. 22	Authority to activate RCECC
Describes the process, templates and individuals involved in issuing a declaration of emergency for a given hazard and how the declaration will be coordinated with neighboring jurisdictions and the State	CPG 101 p. C-7; EMAP 4.5.1			X	CEMP, p. 22	Authority to proclaim a local emergency

Table C-1. Mass Care and Shelter Plans Crosswalk (cont.)

Planning Requirements / Elements	Standard	Score			Location in ESF 6 Document	Findings
		N	P	S		
Describes how legal questions/issues are resolved as a result of preparedness, response or recovery actions, including what liability protection is available to responders	CPG 101 p. C-7;	X			Not identified	Rec: consider question of fiscal responsibility for response
Describes the process by which the EM office coordinates with all appropriate agencies, boards or divisions within the jurisdiction	CPG 101 p. C-7;			X	pp. 4-5	RCECC and ESF 6 Coordinator
Whole Community						
Describes how plans take into account the physical, programmatic, and communications needs of individuals with disabilities and others with access and functional needs (AFN). Including: • Documentation of AFN representation involved in plan preparation and review • List of potential Shelter Sites that meet ADA requirements or reference to relevant database • Program accessibility (e.g., translation and interpreter services, personal assistance, accommodation for durable medical equipment, etc.) to ensure that all residents have access to all services provided including providing support for persons that may rely on durable medical equipment (DME) • Analysis of jurisdictional demographic data to identify AFN populations that may require shelter • Methods to identify AFN populations that may require transportation assistance, and means to provide such assistance	CPG 101, pp. 1-2, and 4-4, C-7, Appendix D1; NFPA, Annex J; Los Angeles OA Mass Care Guidelines, pp. IV 25 - IV-29; FEMA Guidance on Planning for Integration of Functional Needs Support Services in General Population Shelters	X			pp. 2-4	• No documentation of AFN reps in preparation of CEMP or ESF 6 doc • No reference to list of ADA-compliant shelter sites • No detail regarding program accessibility (e.g., translation, DME) • No analysis of AFN demographic data (RHMP Ch. 9 briefly mentions but does not provide estimates of vulnerable pops) • No method for identifying AFN populations that may need trans • General policy references to ADA compliance, and AFN populations; no specific procedures or protocols Rec: consider CEMP and ESF 6 doc revisions to incorporate additional AFN guidance and tools.

Table C-1. Mass Care and Shelter Plans Crosswalk (cont.)

Planning Requirements / Elements	Standard	Score			Location in ESF 6 Document	Findings
		N	P	S		
Describes how plans take into account the essential needs of children	CPG 101 p. C-7 and Appendix D1	X			Not identified	Rec: Consider CEMP and ESF 6 doc revisions to incorporate additional guidance regarding procedures and tools for addressing needs of children. Consider potential for participating in the National Emergency Child Locator Center (NECLC) system.
Describes the methods of registering, screening, admission, and provision for feeding, sanitation, exercise, security, sheltering and long-term care of household pets and service animals brought to shelters.	CPG 101 pp. C-7, C-18, 4-22 thru 4-24 and B10; LA OA Mass Care Guidelines, Sec. XI		X		p. 5	Brief mention of plan for Regional Animal Services of King County to open shelters and coordinate volunteers to staff the RCECC. Regional Shelter Operations Incident Annex (RSOA) details pet/livestock sheltering in activation, set-up, operations, public affairs, and deactivation phases.
Identifies other response/support agency plans that directly support the implementation of this plan (e.g., hospital, school emergency, facility plans)	CPG 101 p. C-7		X		p. 12	The ESF 6 doc references the RSOA - completed). Also references a Community Point of Distribution (C-POD) Annex (to be completed) – not evaluated here.
Organization and Assignment of Responsibilities						
Identifies/outlines the responsibilities assigned to each organization that has a mission assignment defined in the ESF 6 document, including (but not limited to) the following:						
Local senior elected or appointed officials (e.g., Governor, Mayor, Commissioner, Administrative Judge, Council, Executive Director)	CPG 101 p. C-8	X			Not identified	No specific roles identified in ESF 6 doc. Detailed in CEMP.

Table C-1. Mass Care and Shelter Plans Crosswalk (cont.)

Planning Requirements / Elements	Standard	Score			Location in ESF 6 Document	Findings
		N	P	S		
Local department and agencies (e.g., Fire, Law Enforcement, EMS, Health, EMA, social services, animal control)	CPG 101 p. C-8		X		pp. 7 and 9-11	County OEM as lead agency. County departments as support agencies. Very brief lists of key responsibilities.
State agencies most often and/or likely to be used to support Mass Care & Shelter operations (e.g., States' Department of Transportation, State Police/Highway Patrol, Department of Natural Resources [DNR], Environmental Protection/Quality, Emergency Management, Homeland Security, Department of Health/Public Health, and National Guard)	CPG 101 p. C-8		X		p. 11	Lists WA State EOC only. Access to State resources, MOUs, and/or federal resources.
Regional organizations or groups most often and/or likely to be used to support Mass Care & Shelter operations	CPG 101 p. C-8	X			Not identified	
Federal agencies most often and/or likely to be used to support Mass Care & Shelter operations (e.g., FEMA, U.S. Coast Guard, DOJ, FBI, Federal Aviation Administration [FAA], National Safety Transportation Board [NTSB], DoD, DOT, USDA)	CPG 101 p. C-8	X			p. 9	Only FEMA listed - indicates that FEMA will support federal shelters as per Regional Shelter Annex but there is no corresponding language in RSOA.
Government-sponsored volunteer resources (e.g., CERTs, Medical Reserve Corps [MRC], Volunteers in Police Service [VIPS] or Auxiliary Police)	CPG 101 p. C-8	X			Not identified	Rec: evaluate the potential for integrating volunteer organization resources into ESF 6 function.

Table C-1. Mass Care and Shelter Plans Crosswalk (cont.)

Planning Requirements / Elements	Standard	Score			Location in ESF 6 Document	Findings
		N	P	S		
Private and voluntary organizations (e.g., organizations that assist with sheltering, feeding, services for persons with disabilities, animal response, social services, health-related needs, community and faith-based organizations, animal welfare and/or humane organizations, independent living centers, disability advocacy groups, business and industry participation)	CPG 101 p. C-8		X		p. 7	ARC as key supporting agency. Rec: determine realistic ARC capabilities as part of formal C&S assessment. ESF 6 doc indicates that Salvation Army will support disaster services and mass feeding as per Regional Shelter Annex but there is no corresponding language in RSOA.
Describes how roles and responsibilities will be determined for unaffiliated (emergent) volunteers and how to incorporate these individuals into the Mass Care & Shelter operation.	CPG 101 p. C-8	X			Not identified	CEMP references Volunteer Management Annex – not evaluated here.
Identifies agency roles and responsibilities for Mass Care & Shelter, including an emergency organization chart.	CPG 101 p. C-9, EMAP 4.6.6		X		pp. 7-11	No org chart in ESF 6 doc. Note: CEMP TOC indicates both an ESF 6 doc and a Mass Care and Feeding Annex.

Table C-1. Mass Care and Shelter Plans Crosswalk (cont.)

Planning Requirements / Elements	Standard	Score			Location in ESF 6 Document	Findings
		N	P	S		
Includes a list of agencies and personnel not internal to the organization but critical to emergency Mass Care & Shelter operations			X		Not identified	“Other Non-Governmental and Religious Partners” indicated as supporting vulnerable populations and providing spiritual support. There is a reference to the Regional Shelter Annex however, minimal corresponding language in RSOA. Plans do not identify and define specific roles and responsibilities for local faith-based or other non-governmental resources to support care and shelter operations.
Mutual Aid, contract and other agreements.						
MOUs or other forms of agreement with shelter site owner/operators if the plan contemplates use facilities not owned/controlled by the jurisdiction	CPG 101 p. C-8; EMAP 4.8.1	X			Not identified	KCOEM to lead development of all MOUs relative to ESF 6 – not evaluated here.
Agreements for additional Mass Care & Shelter resources/assistance between neighboring jurisdictions’ response forces (e.g., fire, police, EMS)	CPG 101 p. C-8; EMAP 4.8 & 4.9	X			p. 7	KCOEM to lead development of all MOUs relative to ESF 6 – not evaluated here.
MOUs or other forms of agreement with transportation owner/operators (not including regularly scheduled public transit)	LA OA Mass Care Guidelines, Sec. V; Shelter Field Guide, pp. 7-11	X			p. 7	KCOEM to lead development of all MOUs relative to ESF 6 – not evaluated here.
Describes how the jurisdiction maintains a current list of available NIMS Typed Mass Care & Shelter Resources and Credentialed Personnel	CPG 101 p. C-9, EMAP 4.7	X			Not identified	

Table C-1. Mass Care and Shelter Plans Crosswalk (cont.)

Planning Requirements / Elements	Standard	Score			Location in ESF 6 Document	Findings
		N	P	S		
Describes how all tasked organizations maintain current notification rosters, SOPs/SOGs and checklists to carry out their assigned tasks	CPG 101 p. C-9, EMAP 4.6.5 & 4.7.4	X			Not identified	
Describes the jurisdiction's policies regarding public safety enforcement actions required to maintain the public order during Mass Care & Shelter operations	CPG 101 p. C-9			X		CEMP
Direction, Control, and Coordination						
Identifies who has tactical and operational control of Mass Care & Shelter response assets	CPG 101 p. C-9; NFPA 1600, Ch. 6.7			X		CEMP: ESF-6 Coordinator
Discusses multijurisdictional coordination systems and process used during Mass Care & Shelter operations	CPG 101 p. C-9			X		CEMP: ESF-6 Coordinator RSOP does provide some non-standard operational detail for conducting shelter operations but is incomplete and does not address non-shelter functions. Rec: Consider adopting established standard operating procedures or field operations guides (FOGs) that detail the set-up, operation and demobilization procedures for shelters.
Indicates how the EOC will coordinate and communicate with field units, cities, special districts, and other entities for Mass Care & Shelter				X		CEMP: ESF-6 Coordinator
Information Collection and Dissemination						

Table C-1. Mass Care and Shelter Plans Crosswalk (cont.)

Planning Requirements / Elements	Standard	Score			Location in ESF 6 Document	Findings
		N	P	S		
Describes critical information needs and collection priorities for Mass Care & Shelter functions	CPG 101 p. C-9		X		Not identified	CEMP: general discussion of Situation Awareness and process however, no Mass Care & Shelter-specific Essential Elements of Information (EEIs). Rec: Consider incorporating specific EEIs into revised ESF 6 document.
Describes the method in which situation status and analysis for Mass Care & Shelter operations will be captured and reported to all coordinating agencies	CPG 101 p. C-9			X	Not identified	CEMP: ESF-6 Coordinator
Communications						
Describes the framework for delivering communications support and how the jurisdiction's communications integrate into the regional or national disaster communications network	CPG 101 p. C-9, EMAP 4.10.1; NFPA 1600, Ch. 6.5		X			CEMP: ESF 2 document – not evaluated here
Identifies and summarizes separate interoperable communications plans specific to Mass Care & Shelter functions (ex. communication with ARC)	CPG 101 p. C-9	X				CEMP: ESF 2 document – not evaluated here
Functions (Management, Operations, Planning/Intelligence, Logistics, Finance/Administration)						
Management						

Table C-1. Mass Care and Shelter Plans Crosswalk (cont.)

Planning Requirements / Elements	Standard	Score			Location in ESF 6 Document	Findings
		N	P	S		
Indicates how the jurisdiction fulfills the management functions and responsibilities including: • Overall Care & Shelter function management • Public Information assignment • Identification of a media center • Rumor control • Public inquires • Provision for public safety communications and policy • Identification of a Safety Officer • Facility security • Agency liaison • State/federal field activity coordination	NFPA 1600, Ch. 6.6			X	Not identified	CEMP RSOA indicates that KCOEM will assemble a shelter Task Force and staffing shelter leadership positions.
Describes the move from congregate care to non-congregate care alternatives, and provide relocation assistance or interim housing solutions for families unable to return to their pre-disaster homes.	NRF, ESF 8, p. 22		X		Not identified	Post-Disaster Housing Plan – not evaluated here. Note: RSOA utilizes the term “Post-Disaster” to describe the standard “emergency response” phase. Ex. Post-Disaster Emergency Shelter” is not a commonly used term Rec: revise RSOA to utilize “post-disaster” only for activities occurring in short-term recovery (ex. Post-Disaster Housing”)
Operations						

Table C-1. Mass Care and Shelter Plans Crosswalk (cont.)

Planning Requirements / Elements	Standard	Score			Location in ESF 6 Document	Findings
		N	P	S		
Indicates how the jurisdiction fulfills the Operations functions and responsibilities including: - Shelter and feeding operations - Emergency food and water distribution - Unaccompanied Minors - Care for pets and livestock	CPG 101, pp. C-17-19		X		Not identified	Addressed by CEMP, ESF-6 Coordinator. RSOA indicates that ARC is responsible for shelter operations however legal responsibility may remain with the County and/or local jurisdiction.
Identifies and describes the actions that will be taken to identify, open, and staff emergency shelters, including temporarily using reception centers while waiting for shelters to open officially.	CPG 101 p. C-17	X			Not identified; RSOA p. 25	RSOA only discusses temporary shelters in the context of ESF-1 responsibility to provide transportation support.
Describe the agencies and methods used to provide care and support for institutionalized populations (e.g., long-term care and assisted living facilities, group homes), individuals with disabilities, and others with access and functional needs (e.g., medical and prescription support, personal assistance services, durable medical equipment, consumable medical supplies, childcare, transportation [including accessible transportation], foreign language interpreters), including their caregivers.	CPG 101 p. C-17		X		Not identified; RSOA p. 27	Addresses use of triage in Registration to assign residents to the appropriate shelter. Does not address care outside of congregate shelters. Rec: review FEMA guidance for care and shelter of AFN populations and consider revising service delivery model.
Identifies and describes the actions that will be taken to provide alternate shelter accommodations for evacuees from domestic violence shelters.	CPG 101 p. C-17	X			Not identified	Not identified in RSOA either. RSOA does address “Unique Populations” i.e. registered sex offenders. Rec: consider incorporating the specific legal requirements for multiple specific groups in revised RSOA or ESF 6 document

Table C-1. Mass Care and Shelter Plans Crosswalk (cont.)

Planning Requirements / Elements	Standard	Score			Location in ESF 6 Document	Findings
		N	P	S		
Identifies and describes the actions that will be taken to notify or inform the public about the status of injured or missing relatives.	CPG 101 p. C-18	X			Not identified	Rec: assign responsibility to County agency/department
Describes the agencies/organizations and methods for providing feeding services both within the shelter facilities and at other identified feeding sites or mobile feeding operations.	CPG 101 p. C-18		X		p. 11	Limited to indicating that a Mass Feeding Task Force will be established. Also, listing of mass feeding role for ARC and Salvation Army. RSOA details some elements of a mass feeding program but does not provide a unified concept of operations. RSOA indicates that KCOEM and ARC should have MOUs/contracts in place prior to an event – not evaluated here. Rec: consider developing a Mass Feeding element similar in scope and detail to the shelter element.
Logistics						

Table C-1. Mass Care and Shelter Plans Crosswalk (cont.)

Planning Requirements / Elements	Standard	Score			Location in ESF 6 Document	Findings
		N	P	S		
Indicates how the jurisdiction fulfills the Logistics functions and responsibilities including: • Field incident support • Communications support • Transportation support • Personnel • Supply and procurement • Resource tracking • Sanitation services • Computer support	CPG 101, p. C-11		X		Not identified	CEMP: KCECC Logistics Section; RSOA indicates function to access resources via RCECC Logistics Section.
Describes how resources are mobilized and managed. Includes methods to contact emergency response personnel during normal and after-hours. This may be in the form of an alert list				X	Not Identified	CEMP: KCOEM Duty Officer
Describes/identifies the procedures and agencies involved in using the existing hazard analysis and capability assessment to identify what resources are needed for a response to the dam failure hazard, including using past incident critiques to identify/procure additional resources	CPG 101 p. C-11, EMAP 4.11.3;	X			Not identified	Rec: Consider conducting a formal mass care and shelter capabilities assessment.
Describes/identifies the steps taken to overcome the jurisdiction's identified resource shortfalls, including identifying the resources that are only available outside the jurisdiction (e.g. Water Rescue, Search and Rescue teams) and the process to request those resources	CPG 101 p. C-11	X			Not identified	Rec: Consider conducting a formal gap analysis of mass care and shelter capabilities relative a worst case dam failure scenario.

Table C-1. Mass Care and Shelter Plans Crosswalk (cont.)

Planning Requirements / Elements	Standard	Score			Location in ESF 6 Document	Findings
		N	P	S		
Identifies sources, duties and organization of shelter site staff including: • Source of staff for initial activation • Source of staff for subsequent operational periods • Categories, number, and organization of staff for shelter operations • Description of duties by position (e.g., position checklist or job description) • Just-in-Time (JIT) materials if staff are not pre-trained • Policies and procedures for using residents or other volunteers to assist in performance of shelter functions	Shelter Field Guide, pp. 11-17, 63-77; LA OA Mass Care Guidelines, Sec. VII; Shelter Field Guide, p. 12				Not identified	RSOA indicates KCOEM will staff key shelter leadership positions and assist in training County staff. Training and exercise schedule to be developed as part of KCOEM training cycle. Rec: Identify categories and quantity of staff needed to support all Mass Care and Shelter operations as part of formal Shelter Needs Assessment. Assign responsibility for identifying and training staff to County departments and stakeholder agencies. Rec: Select an operational standard (ex. ARC Shelter Guide) and encourage training and exercises to that standard for all jurisdictions in the County.
Identifies how food and cooking/serving equipment is sourced; source of food preparation staff; provision for appropriate health and sanitation inspections	LA OA Mass Care Guidelines, Sec. VII; Shelter Field Guide, p. 33		X		Not identified	Assigns feeding responsibility to ARC and support role to Salvation Army. Assigns inspections to Public Health. However, no detail on sourcing food and equipment.

Table C-1. Mass Care and Shelter Plans Crosswalk (cont.)

Planning Requirements / Elements	Standard	Score			Location in ESF 6 Document	Findings
		N	P	S		
Contains lists pre-screened sites, or references to a database of pre-screened sites. At a minimum site information should include street address; capacity; whether food preparation facilities are on site; evidence of ADA compliance; 24/7/365 contact and access procedures; and any known limitations on use or access	LA OA Mass Care Guidelines, Sec. VII; CPG 101 pp. 4-18-4-24	X			Not identified	Rec: Identify and evaluate potential ARC and non-ARC shelter sites in coordination with stakeholder organizations/agencies. Enter and maintain data in the National Shelter System (NSS).
Provides policy, guidance and direction regarding the establishment and operation of Mega-Shelters.	Mega-Shelter Planning Guide					Rec: As part of formal Shelter Needs Assessment, identify potential for mega-shelter facilities and logistics support. Determine appropriateness and, if needed, incorporate into a revised ESF 6 document.
Provides information about specialized equipment, facilities, personnel, and emergency response organizations currently available to support children, individuals with disabilities, and others with access and functional needs	CPG 101 p. C-11	X			Not identified	Rec: Identify specialized resources as part of formal Shelter Needs Assessment.
Describe the method by which necessary developmentally appropriate supplies (e.g., diapers, formula, age appropriate foods), staff, medicines, durable medical equipment, and supplies that would be needed during an emergency for children with disabilities and other special health care needs will be addressed	CPG 101 p. C-11	X			Not identified	Rec: Identify specialized resources as part of formal Shelter Needs Assessment.

Table C-1. Mass Care and Shelter Plans Crosswalk (cont.)

Planning Requirements / Elements	Standard	Score			Location in ESF 6 Document	Findings
		N	P	S		
Provides policy, guidance and direction regarding establishment and conduct of mass feeding operations not connected with congregate shelter operations	LA OA Mass Care Guidelines, Sec. XI		X		Not identified	Assigns feeding responsibility to ARC and support role to Salvation Army. Assigns inspections to Public Health. However, no detail on sourcing food and equipment.
Provides policy, guidance and direction regarding establishment and operation of Commodity Points of Distribution (CPODs)	LA OA Mass Care Guidelines, Sec. X		X			RSOA refers to a CPOD Annex – not evaluated here
Provides policy, guidance and direction regarding coordination of disaster welfare inquiry/family reunification.			X		pp. 7-8	Assigns responsibility to ARC to administer via Safe and Well Website. Rec: Consider potential for participating in the National Emergency Family Registry and Locator System (NEFRLS).
Plan Development and Maintenance						
Describe how these Mass Care & Shelter plans were coordinated with the relevant plans from adjoining/intra-State Regional jurisdictions to include Local political subdivisions	CPG 101 p. C-11; NFPA 1600, Ch. 6.3		X		Not identified	CEMP addresses its development.

Table C-1. Mass Care and Shelter Plans Crosswalk (cont.)

Planning Requirements / Elements	Standard	Score			Location in ESF 6 Document	Findings
		N	P	S		
Describe the process used to review and revise the plan each year or — if changes in the jurisdiction warrant (e.g., changes in administration or procedures, newly added resources/training, revised phone contacts or numbers) — more often	CPG 101 p. C-11; EMAP 4.8.3,		X		p. 7	KCOEM to maintain ESF 6 document.
Describe/identify how or where the plan is made available to the public	CPG 101 p. C-11		X		Not identified	However, the document is posted on the County web site
Training and Exercises						
Describe the schedule for identifying and meeting training needs based on the expectations created by the plans; the process and schedule for developing, conducting, and evaluating exercises and correcting identified deficiencies	CPG 101 p. 3-10, and 4-25 - 4-26; NFPA, Chs. 7 and 8 and Appendix A		X		Not identified	Minimal training/exercise language in CEMP. Rec: develop additional training and exercise events specific to Mass Care & Shelter function tied to results of Formal Shelter Needs Assessment. Incorporate in multi-year TEP and assess as part of annual THIRA.