

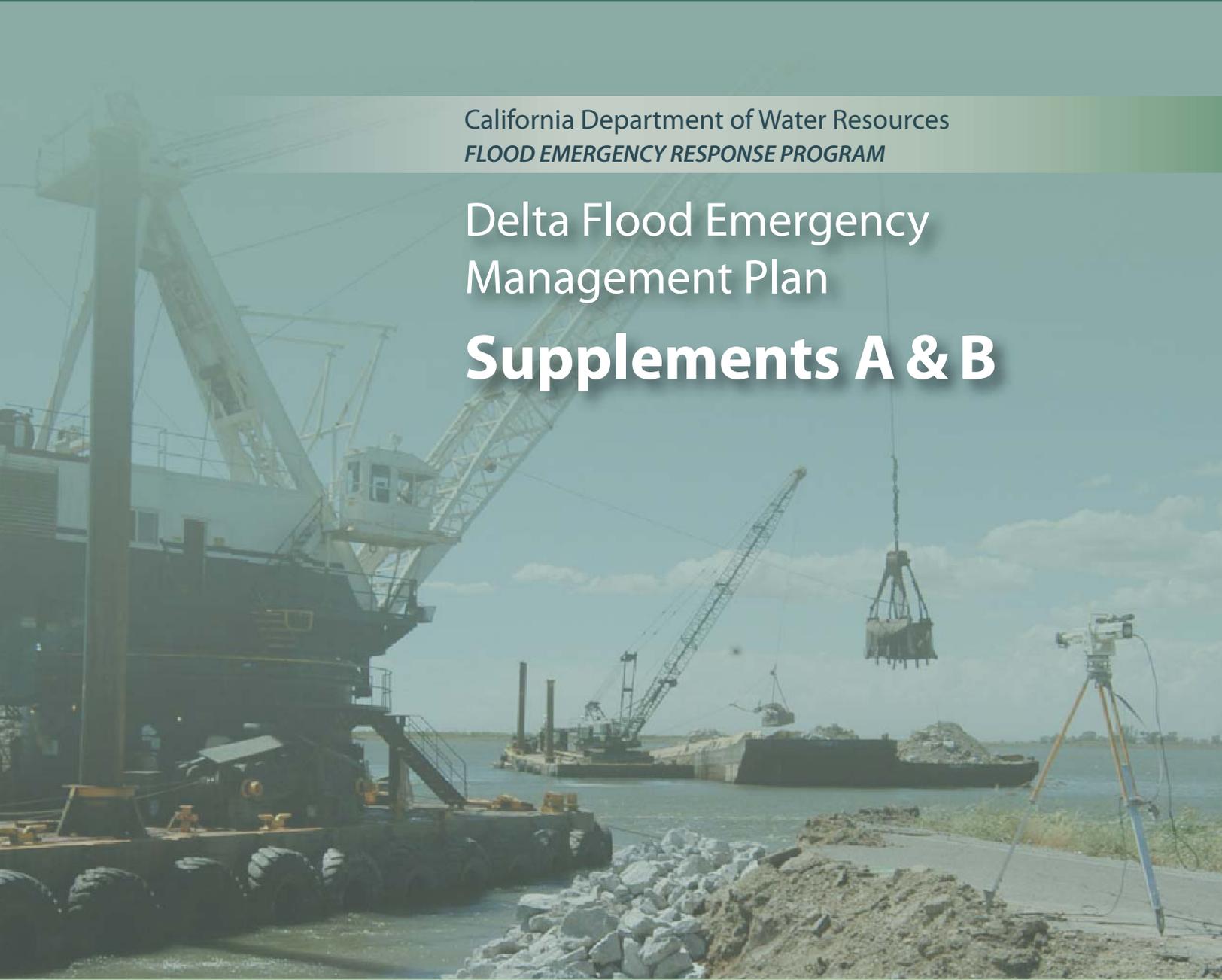
*INTERDEPARTMENTAL DRAFT*

April 2014

California Department of Water Resources  
*FLOOD EMERGENCY RESPONSE PROGRAM*

# Delta Flood Emergency Management Plan

# Supplements A & B



# Supplement A – Preparedness and Response Action Sheets

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Supplement A provides sheets that summarize actions that can be taken to respond to and recover from flood emergencies.

The response actions on the following pages can be grouped based on times before a Delta emergency, during an emergency but before levee failure, and after levee failure(s):

<b>Preparedness/Prior to Delta Emergency</b>	<b>Page</b>	<b>Plan Section Reference</b>
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Note: The actions listed above for during Delta emergency can also be ongoing after levee failure(s).

## A.1 Inventory Resources

## Preparedness 3.1

**Responsible Party:**

DFM  
POC

**Condition:** Normal ongoing duties

**Timeframe:** Pre-Emergency Scheduled

**Duration:** As needed

**Response Action Description:**

Inventorying resources (people, materials, equipment, and facilities) ensures that the Department is ready to take action when a Delta flood emergency occurs. While flood emergencies can occur at any time during the year, the inventory of resources generally is completed annually prior to the winter flood season and updated during response and after restocking.

**Procedure:**

1. The inventory is on the following schedule.

Resource	Check on Preparedness	Frequency	By Date	Responsible Branch/Office/Section
Facilities materials & equipment	Inventory	Annually	May 31 <sup>st</sup>	RASS
	Restock as needed	Annually	Sept 30 <sup>th</sup>	RASS
Rosters of Department personnel & position qualifiers	Review & Update	Annually	Oct 31 <sup>st</sup>	RASS
Lists of Ground Support Contractors in Logistics Plan	Review & Update	Annually	Sept 30 <sup>th</sup>	RASS
Lists of Active Contracts (TBD)	Update	At change	As needed	RASS/RFPS
Lists of Services/Suppliers in Logistics Plan	Update	At change	As needed	RASS
Delta Maps and Fact Sheets Supplement B	Review & Update	Every 5 years		FOC
Templates (TBD)	Review and update	At change	As needed	FOC
Agreements (TBD)	Review and update	At change	As needed	RASS/RFPS
Delta Flood Emergency Management Plan (this document)	Review and update	As policies change, but at least every 5 years		RFPS

### **Constraints:**

- Potential conflict with other duties. Since these inventories should occur on a set schedule, they should be incorporated into the work plan and have priority at the specified times
- Suitable Contractor/Vendors must register as a BidSync vendor for preparedness purchases

### **Related Actions:**

- Training/Exercises

### **Comments:**

- Detailed information regarding flood fight materials may be found in the Flood Fight Materials Management Plan

## A.2 Training/Exercises

## Preparedness 3.1.2

### Responsible Party:

DFM  
POC

Condition: Normal ongoing duties

Timeframe: Pre-Emergency Scheduled

Duration: As needed

### Response Action Description:

Having Department staff properly trained in their duties and in potential response scenarios will ensure that they are ready to safely respond when an emergency occurs.

### Procedure:

- DWR will conduct training and exercises according to the following schedule

Resource	Check on Preparedness	Frequency	By Date	Responsible Branch/Office/Section
Flood fighting methods New employee orientation	Training & safety orientation for flood fighting crews	During developing emergency and pre-season actions	Prior to deployment	RASS, Direct Supervisors
	Employee reviews this Plan as part of employment orientation	At employment	During first month of employment	FOB
Introductory preparedness and response training	Eight hour orientation classes	Refresh Every 5 years	Aug 31 <sup>st</sup>	RASS, Direct Supervisors
Table top exercises	Half day classes with 3 Delta flood emergency scenarios	Annually	Oct 31 <sup>st</sup>	RASS/Delta Exercise Planning Team
Functional Exercises or Field Exercise	Day-long exercises with 1 evolving Delta flood emergency scenario	Alternate between exercises every 2 years	May 31 <sup>st</sup>	RASS/Twitchell Island Exercise Planning Team, DFM
Full Scale Exercise	Combination of Functional and Field Exercises	5 years	August 31 <sup>st</sup>	RASS, DFM

### Constraints:

- Potential conflict with other duties. Training should be incorporated into the work plan and have priority at the specified times
- Personnel receiving FOC/ICT team assignments as Section Chiefs and Officers must have ICS 300 & 400 to ensure FEMA will reimburse the Department for reimbursable emergency activities
- Position specific training must be developed and implemented to team members

**Related Actions:**

- Inventory Resources
- Training/Exercises

**Comments:**

**Responsible Party:**

FOC (Primary)  
POC, DSOD

**Condition:** Notice of Emergency**Timeframe:** Immediately**Duration:** Few hours to days**Response Action Description:**

Upon awareness of an emergency condition, the FOC will verify conditions in the field and identify and assess damage. This may involve making confirming calls to locals (LMAs) or to dispatch trained staff to evaluate the situation and to provide preliminary information. Obtaining information on levees that are damaged on islands/tracts that have not yet flooded provides information to assist external agencies determination of the need to evacuate and in planning levee repairs.

**Procedure:**

1. Gather initial information on the flood incident. For “no notice” events, such as earthquakes, the FOC may need to authorize reconnaissance assets (aerial or other) to report overall status of Delta levees, as well as initiating calls to LMAs or OAs to assess damage and possible flood threats. For “noticed” events, such as a slow rising flood, LMAs and local authorities have usually established lines of communication with the FOC, and initial reconnaissance of the damage and possible flood threats can be supplied by these local assets. FOC Planning and Intelligence Section obtains and logs available information on emergency conditions (levee damage and threat)
2. FOC Director or FOC Operations Chief may dispatch experts - specialists (geotechnical engineers, levee specialist, and environmental scientists) to the field – to verify and evaluate damage. The FOC may provide material support to arrest the development of the flood emergency situation – the LMA/OA must expend or plan to expend their resources prior to receiving additional material support from the FOC
3. Continue to monitor levee conditions, hydrology, water stages, water quality or other known critical conditions on a daily basis
4. Review, confirm, or refine (as necessary) **all** ongoing emergency response actions on a daily basis

**Constraints:**

- Weather and accessibility issues for field reconnaissance
- Safety issues for staff for field reconnaissance

**Related Actions:**

- Evaluate Situation
- Prioritize Response Actions
- Flood Fights
- Environmental Concerns

**Comments:**

- Closely related to actions to evaluate situation

**Responsible Party:**

FOC (Primary)

**Condition:** Notice of Emergency**Timeframe:** Immediately**Duration:** Few hours to days**Response Action Description:**

Based upon the verified conditions in the field, evaluate the current and near future situation and condition of Delta levees, islands, and tracts in preparation for prioritizing actions and deploying resources.

**Procedure:**

1. Estimate resource allocation based on currently available information (See Forms, Memos, and Instructions document) and refine as additional information surfaces. Assemble information on affected islands/tracts from maps and data contained in Supplement B
2. Consider environmental features listed in Supplement B for avoidance or later mitigation. Supplement B will aid in analyzing deployment and response options and routes
3. Use the Delta Emergency Response Tool (DERT) to quickly estimate effects of potential or actual levee failures
4. Continue to monitor levee conditions, hydrology, water stages, water quality, or other known critical conditions on a daily basis
5. Review, confirm, or refine (as necessary) all ongoing emergency response actions on a daily basis

**Constraints:**

- Weather and accessibility issues for field reconnaissance
- Safety issues for staff for field reconnaissance

**Related Actions:**

- Damage Identification and Verification
- Prioritize Response Actions
- Flood Fight

## **A.5. Aerial Resources**

## **Response 4.3.3**

### **Responsible Party:**

FOC (Primary)  
OA

### **Condition:**

Notice of Emergency

### **Timeframe:**

Immediately

### **Duration:**

Few hours to days

### **Response Action Description:**

Use aerial reconnaissance if earthquake (on Hayward or others) cause noticeable Delta shaking. Consider use of aerial reconnaissance for other known levee problems as allowed by weather conditions. Mobilize helicopters for use in observing known specific levee problems. Mobilize fixed wing aircraft for use in observing broader general conditions in the Delta. Coordinate with OA or Cal OES

### **Procedure:**

1. Contact OA for Air asset support through liaison or direct contact, or
2. Contact Cal OES for Mission number for National Guard helicopter asset, or
3. Contact USACE, FEMA, via Cal OES for air assets as needed on share basis

### **Constraints:**

Should contact OA for coordination of air assets to ensure FEMA reimbursement

### **Related Actions:**

- Verify and Evaluate Situation
- Flood Fights
- Prepare Action Plans
- Compare new data to historic data on file

### **Comments:**

- Ground subsidence or other surface displacement data is available via the NASA/JPL project - Remote Sensing in the Delta Region

**Responsible Party:**

FOC  
POC, DOC

**Condition:** Notice of Emergency

**Timeframe:** Immediately

**Duration:** Maintain until end of emergency

**Response Action Description:**

Beginning at notice of a Delta flood emergency, the Department activates and operates under several emergency systems. The Department policy is to operate in compliance with SEMS. The DFM has the lead responsibility to ensure all divisions within the Department operate in compliance with SEMS. DWR coordinates with the LMA, OA and Cal OES' Inland and Coastal REOCs when a Delta emergency situation arises. The FOC is considered to be the link to the field response level. Chapter 2, ConOps, of this document broadly describes how the Department operates within these and other emergency systems.

The Flood Emergency Operations Manual describes the coordination of Federal, State, and local agency activities at the State-Federal FOC before and during flood events and emergencies, and is designed to provide a general overview for personnel working at the FOC. Refer to the FEOM as a primary source of information, as well as the following procedures.

**Procedure:**

1. The Flood Operations Branch chief issues a Flood Alert memorandum to officially activate the FOC under SEMS
2. All Department divisions cooperate with the FOC's request for staff to fill positions needed for SEMS compliance
3. Continue Flood Alert activities with expansion of regular DFM personnel duties to meet these needs
4. If necessary, the FOC Director recommends that the Department Director issue a department wide Flood Mobilization memorandum
5. FOC Director in coordination with the Operations Chief may activate a Delta Area Incident Command Post in large-scale events, per procedures in the FEOM
6. Use appropriate automated tools to report and update levee incidents

**Constraints:**

- Space – The FOC is quickly overwhelmed by too many people, who need to be close at hand during the response

- Staff making high water notification calls should be dispersed to areas outside of the FOC / Bullpen area
- Assess need to set up additional locations within the JOC for coordinated SEMS response

**Related Actions:**

- Evaluate Situation
- Flood Fight

**Comments:**

- At the request of the FOC, the North Central Region will support and supplement the flood fighting efforts for the Delta
- When the FOC is activated, personnel report for duty on shifts as directed by the FOC Director to provide up to 24-hour staffing
- If additional personnel resources beyond the capability of the DFM are needed to staff the FOC under extended hours (which typically happens under Flood Mobilization status) they will be requested first from the Division of Integrated Regional Water Management and Regional Offices and then from other Department divisions and offices

**Responsible Party:**

FOC  
POC, DOC

**Condition:** Ongoing emergency**Timeframe:** Immediately**Duration:** Until end of emergency**Response Action Description:**

The Department will coordinate with OAs within the Delta, LMAs, Cal OES, USACE, and USBR. The FOC shall coordinate with all affected OAs to determine whether LMAs, local and State resources can meet the emergency response need. If the combined resources are insufficient, the FOC shall prepare a request for USACE emergency response assistance under PL 84-99 for the Director's signature. The FOC shall also facilitate field coordination and provide technical expertise for the LMAs in incidents that involve the USACE. For levee-endangering incidents, the FOC, upon request, shall provide technical advice to LMAs in meeting their responsibilities for first response to levee endangering incidents, and advise the LMAs to contact their OA (as defined under SEMS) for mutual aid assistance and resources. The Department is the lead coordinator for local, State, and Federal flood fight activities.

**Procedure:**

1. Coordinate as necessary with affected local, State, and federal agencies
2. DWR will coordinate according to the protocols outlined in Chapter 1 of the FEOM
3. When facilities of the SWP are affected by flooding the POC coordinates activities at each incident with the FOC
4. During an emergency, the DOC will:
  - Send representatives to the Cal OES SOC and REOC when necessary
  - Establish a liaison with the USACE, Cal FIRE, and CCC as needed
  - Locate, assess, and report to Cal OES, damage to the Sacramento–San Joaquin Rivers flood control projects

**Constraints:**

- Establish relationships with external agencies to ensure cohesive working relationships and mutual understanding of capabilities
- Additional Department staff need to be trained to appropriately represent DWR interests when acting as a liaison for the Department or FOC

**Related Actions:**

- Prioritize Response Actions
- Training/Exercise

## **Comments:**

- Upon request, the FOC provides technical advice on flood fighting. Technical assistance may be requested directly through the FOC, or through the OA. The FOC may be placed on Alert during this advisory period

### **Responsible Party:**

FOC

POC

**Condition:** Prior to Flood Fight

**Timeframe:** Developing Emergency

**Duration:** Less than 4 hours

### **Response Action Description:**

The FOC will prioritize its response activities and set priorities among potentially competing needs prior to initiating flood fights. This is particularly important when multiple flood threats are ongoing within the Delta and activities must be prioritized. Plan preparation is not intended to take more than a few hours, and some actionable work for prioritized flood fight locations could be initiated within several minutes of awareness of a flood threat before the entire plan is completed. The plan provides time to inventory the various flood threat locations, consider likely population and assets at risk, identify needed resources, and prioritize flood fight locations.

The response plan will outline how the FOC will participate in flood fights for levee boils, erosion, instability, overtopping, earthquake damaged levees, protection of interior or levees on flooded islands/tracts, and protection of levees on islands/tracts adjacent to flooded islands. The plan should consider need for resources including flood fight crews from other agencies and assistance from USACE and other agencies.

### **Procedure:**

1. Assemble data; real-time event and location data. Document and prioritize flood threat locations
2. For levee-endangering incidents, the FOC, upon request, shall provide technical advice to LMAs in meeting their responsibilities for first response to levee endangering incidents, and advise LMAs to contact their OA for mutual aid assistance and resources
3. Prioritize flood fight based on information from Table A
4. Consider modifications to the Table priorities depending on access issues, worker safety, or other factors based on the professional judgment of the FOC Director
5. Mobilize/dispatch flood fight personnel and or materials when authorized
6. Mobilize/dispatch repair contractors (marine and land-based) when authorized
7. Request PL 84-99 assistance as needed
8. If the anticipated island/tract flooding volume exceeds 100,000 acre-feet initiate detailed hydrodynamic modeling to refine information obtained from the DERT. Contact the Department's Delta Modeling Branch or based on availability and ability to immediately respond to modeling request. Continue revisions to the modeling for the duration of the emergency to capture evolving conditions
9. Review, confirm, or refine (as necessary) **all** ongoing emergency response actions on a daily basis, or more often if developing conditions dictate a change of action

**Table A: The Department's Flood Emergency Response Categories for Islands/Tracts**

<b>PRIMARY CRITERIA</b> See Supplement B for population, infrastructure, assets and other island/tract characteristics	<b>SECONDARY CRITERIA</b> Each response category is further sorted in order of the listed secondary criteria (if applicable)	<b>RECOMMEND MINIMUM RESPONSE ACTION</b>	<b>RESPONSE CATEGORY</b>
<b>Population &gt; 2000</b> (Protection of Life and Property)	-none-	FLOOD FIGHT UNTIL LEVEE IS STABILIZED OR FAILURE	<b>1</b>
<b>2000 &gt; Population &gt; 100</b> (Protection of Life and Property)	A. Legacy Towns B. Hwys/Evac Routes C. WQ/WS Infrastructure	FLOOD FIGHT UNTIL LEVEE IS STABILIZED OR FAILURE	<b>2</b>
<b>Water Quality/Water Supply Infrastructure</b>	A. Population B. Project Levees	FLOOD FIGHT UNTIL SITUATION IS NO LONGER URGENT OR OTHERWISE CHANGES	<b>3</b>
<b>Hwys/Evacuation Routes</b> Recommended response actions in the following order: J11, 160, 4, 12, Interstates, and other county roads (Life Safety)	A. WQ/WS Infrastructure B. Population (descending order)	FLOOD FIGHT UNTIL SITUATION IS NO LONGER URGENT OR OTHERWISE CHANGES	<b>4</b>
<b>100 &gt; Population</b> (Protection of Life and Property)	A. Project Levees B. Other Critical Infrastructure	FLOOD FIGHT UNTIL LEVEE IS STABILIZED OR FAILURE	<b>5</b>
<b>Project Levees</b> (Protection of Property)	A. Other Critical Infrastructure B. Assets	FLOOD FIGHT UNTIL LEVEE IS STABILIZED OR FAILURE	<b>6</b>
<b>Other Critical Infrastructure</b> Mokelumne Aqueduct, Railroads, Electrical Transmission Lines (Protection of Property)	A. Assets	PROVIDE TECHNICAL ASSISTANCE OR FLOOD FIGHT WITH AGREEMENTS IN PLACE	<b>7</b>
<b>Assets (\$M)</b> (Protection of Property)	-none-	PROVIDE TECHNICAL ASSISTANCE	<b>8</b>

The resource sequencing in Table A is based on the following:

- **Population.** In general, the FOC Director shall deploy the Department's resources in descending order of population since public safety is the highest priority. Although the population may already be evacuated prior to a levee failure, protection of property is a high priority so the population can return after the emergency passes
- **Water Quality and Water Supply Infrastructure.** The eight western islands and tracts (Sherman Island, Twitchell Island, Bradford Island, Bethel Island, Jersey Island, Webb Tract, Hotchkiss Tract, and Holland Tract) have been identified by the State as being critical to water quality in the Delta as they provide a buffer against saltwater intrusion. Levees along water conveyance corridors are also important: Victoria Canal (Victoria Island and Union Island), Barker Slough (Hastings Tract), Rock Slough (Hotchkiss, Veale and Holland); and Old River & Middle River (Victoria Island, Woodward Island, Bacon Island, Mandeville Island, McDonald Island, Jones Tract (Upper and Lower), Drexler Tract, Middle Roberts, Union Island, and Clifton Court). During high flood flows, levee failures along these corridors would have significantly less impact on water quality than failures that may occur during dry periods. Therefore, levees along these corridors that are damaged in the course of an earthquake during low-flow conditions will have a higher priority for repair than if they failed during a high water event. In addition, water infrastructure such as facilities of the SWP and other water conveyance features may need emergency response assistance to protect them from failure
- **Highways.** Highways provide significant health and safety benefits in that they are used for evacuations and medical response. Emergency responders rely on highways for access during for flood fights and other emergency response activities such as evacuations. In addition, flooding of major highways through the Delta would cause significant disruption to the regional and State economies
- **Other Critical Infrastructure.** Levees protecting private utility corridors, railroads, and utility water conveyance facilities are important to the State economy and can impact public health. For example, the Mokelumne River Aqueduct crossing the south Delta from east to west provides water to approximately 1.3 million people in the East Bay Municipal Utility District service area. A failure of the aqueduct, especially if a levee fails at a crossing of the aqueduct, could result in longer-term health and welfare problems
- **\$ Assets.** When population is less than about 100 people on an island or tract, it may be easier to order allocation of resources based on \$ assets. In most cases, assets provide a good surrogate for the order of population at risk. Examples: homes, improvements, gas wells, livestock, power transmission, etc.

### **Constraints:**

- None, except there may be an urge to authorize flood fight activities without preparing a plan. Under multiple levee threats, the initial portion of the plan may simply be the FOC manager thoughtfully considering all the currently known flood threats locations in the Delta and identifying an action priority based on professional judgment
  - Written plans are essential to Department, FOC and POC operations

**Related Actions:**

- Evaluate Situation
- Activate Emergency Systems
- Coordinate
- Damage Identification and Verification

**Comments:**

- This response plan is only for flood fight conditions prior to levee failure(s). A separate plan is required for any State work associated with flooded islands/tracts

**Responsible Party:**FOC  
POC**Condition:** Flood Mobilization**Timeframe:** Following action plan**Duration:** A few hours to many days**Response Action Description:**

Immediately following preparation of response plan in cooperation with the LMA, deploy requested personnel, equipment, and materials to flood fight levees in danger of failing. Levees weakened by earthquakes, movement, seepage, erosion, wave action, or overtopping may require flood fights based on priorities set in the action plan. Levee reinforcements to weakened levees are temporary methods that cannot be expected to last for extended periods of time, but are intended to stabilize the situation and avoid levee failure. Emergency flood fight methods may include sandbagging, boil control, wave wash protection, and levee overtopping protection. Flood fight may include more extensive construction work to stabilize earthquake damaged levees on un-flooded island/tracts. Flood fight methods may be extended to islands/tracts that have flooded due to levee breaches and include protection of levees on the interior of flooded areas and protecting levees on adjoining islands/tracts from seepage or other damage. This action is continued until levees are stabilized.

**Procedure:**

1. For levee-endangering incidents, the FOC, upon request, shall provide technical advice to LMAs in meeting their responsibilities for first response to levee endangering incidents, and advise LMAs to contact their OA (as defined under SEMS) for mutual aid assistance and resources. [The LMA/OA is expected to expend or plan to expend their resources prior to receiving additional materials from the FOC. The LMA or OA determine if additional (FOC) support is necessary to manage flood/high water issue]
2. ICT's do not deploy until the FOC Operations Chief and FOC Director establish their need
3. Mobilize flood fight crews based on progression established in the Response Plan approved by the FOC Director. LMA requests crews from OA, the OA requests crews from Cal OES. The Department requests assistance from USACE as necessary
4. Obtain State hold harmless from LMA for any State flood fight assistance
5. Provide on-site safety briefings to deployed personnel
  - o Ensure appropriate PPE equipment is available for ICT or crews
6. Follow procedures in the Department's Emergency Flood Fighting Methods [http://www.water.ca.gov/floodmgmt/docs/flood\\_fight\\_methods.pdf](http://www.water.ca.gov/floodmgmt/docs/flood_fight_methods.pdf)
7. Follow the Response Plan prepared for the event as modified with real-time communication with the FOC Director
8. Upon request of the FOC, the North Central Region will support and supplement the FOC's flood fighting coordination efforts, for the Delta

9. Flood fight may be extended to levees for islands/tracts bordering islands/tracts that have flooded to prevent damage from boils or other levee stressors

### **Constraints:**

- Availability of trained staff, materials and equipment
- Weather and accessibility issues
- Safety issues for staff

### **Related Actions:**

- Prioritize Response Actions
- Training/Exercise
- Damage Identification and Verification
- Coordinate

### **Comments:**

- Flood fighting on levees is the primary responsibility of the LMAs, which will assume the role of the Incident Commander in most circumstances. If a flood fight exceeds the capability of the LMAs, or if communities are threatened, the responsible city or county will provide assistance with support from the FOC
- The FOC or its designee, upon contact from the LMAs, shall determine the need for assistance and may send a flood fight and/or technical specialist to the site. The FOC shall assume leadership for the Department's participation in the incident
- When facilities of the SWP are threatened by flooding the Division of O&M may assist with coordination of activities at each incident with the FOC. ICTs have been established to provide a SEMS-based emergency response organizational structure to the field response efforts. Headquarters personnel may also be assigned to the FOC to provide technical expertise as required
- The FOC can also obtain flood fighting crews for the Delta through Cal OES' Inland REOC as requested by local Delta levee districts and as coordinated through their corresponding OAs. The crews typically come from CCC or through Cal FIRE, which provides trained inmate crews from the Department of Corrections

**Responsible Party:**

FOC

**Condition:** Flood Mobilization**Timeframe:** Upon request**Duration:** Duration of emergency**Response Action Description:**

The Department is the State's liaison to the USACE for its emergency assistance, under PL 84-99. The USACE can provide emergency flood fight assistance under its PL 84-99 authority on local levees that either protect populated areas or public infrastructure, or have "pre-qualified" for PL 84-99 by meeting USACE structural criteria.

**Procedure:**

1. The FOC's PL 84-99 Officer, or other assigned FOC personnel, contacts USACE and requests PL 84-99 flood fight assistance
2. Within 24 hours following a verbal request for assistance, obtain and forward to the USACE a formal request letter signed by the Department Director
3. Provide USACE documentation and information as needed
4. Continue to coordinate with USACE during duration of emergency

**Constraints:**

- Documented justification of the emergency response is required for USACE involvement

**Related Actions:**

- Prioritize Response Actions

**Comments:**

- USACE provides Federal assistance under PL 84-99 when required levels of flood fighting exceed State and local resources. USACE assistance during flood fighting operations will be of a temporary nature to meet the immediate threat and to supplement state and local efforts. USACE may provide Technical Assistance or Direct Assistance per DWR's MOU with USACE. Flood Fighting on agricultural levees will be limited to the provision of technical assistance. For additional information, see the *Memorandum of Understanding Between U. S. Army Corps of Engineers (South Pacific Division) and California Department of Water Resources for Cooperative Actions Authorized under Public Law 84-99 For Responding to Flood Emergencies*

## A.11 Release Water from U/S Reservoirs

## Response 4.1.2

### **Responsible Party:**

DFM  
POC, DOC

**Condition:** Imminent or actual levee failure(s)

**Timeframe:** Immediately

**Duration:** As supported by analyses

### **Response Action Description:**

Release of water from upstream reservoirs in anticipation of imminent Delta levee failures or with actual levee failure can provide fresh water flow into the Delta and decrease salt intrusion as islands/tracts flood. However, water release should only occur if there is a reasonable expectation that the water can reach the Delta before levees/tracts with failed levees are completely flooded. Releases should only be made if the flooded volume is expected to be between 200,000 acre-feet and 500,000 acre-feet and X2 is greater than 65 km. Scenario modeling has indicated that for conditions outside these parameters, the reservoir water would be better saved for possible use to flush Delta channels after the levee breaches are closed.

### **Procedure:**

1. Determine anticipated or actual flooded volume for islands/tracts with failed levees
2. If flooded volume is less than 200,000 acre-feet, stop – do not use this response action
3. Determine prior day X2 from [http://cdec.water.ca.gov/cgi-progs/selectQuery?station\\_id=CX2&sensor\\_num=145&dur\\_code=D&start\\_date=&end\\_date=now](http://cdec.water.ca.gov/cgi-progs/selectQuery?station_id=CX2&sensor_num=145&dur_code=D&start_date=&end_date=now)
4. If computer access to CDEC is not available, estimate X2 from following Table. Use the 5th column if year is judged to be very wet. Use the “Mean” column if the year is judged to be about average. Use the 95th column if the year is judged to be very dry

**Historic Location of X2 (in km) by Month**

	<b>5th</b>	<b>Mean</b>	<b>95th</b>
January	58.9	77.2	86.0
February	51.3	71.1	83.7
March	50.5	65.3	78.1
April	48.3	64.9	78.0
May	51.6	67.7	79.0
June	54.8	70.7	81.9
July	58.1	74.6	82.1
August	67.5	78.1	85.5
September	77.7	83.6	86.7
October	73.8	85.3	89.2
November	74.0	85.3	87.8
December	67.1	83.1	88.1

1. If X2 is less than 65 km, stop – do not use this response action
2. If flooded volume is greater than 500,000 acre-feet, stop – do not use this response action
3. Request New Melones outflow be increased by 2,000 cfs subject to outlet capacity, downstream channel capacity, and public safety; contact: New Melones Powerplant – Area Office Manager, 916-989-7180 \_\_\_\_\_
4. Request Folsom outflow be increased by 5,000 cfs subject to outlet capacity, downstream channel capacity, and public safety; contact: Folsom Dam – Operator: Area Office Manager, 916-402-4678 or 916-989-7251 (24 hr) \_\_\_\_\_
5. Evaluate need for continuing or increased reservoir releases. Use Water Analysis Model (WAM) for quick indication of the value of reservoir releases. Use more detailed hydrodynamic modeling to determine the value of continued reservoir releases
6. Cease New Melones and Folsom releases when flooding of islands/tracts stabilizes or as long as supported by hydrodynamic modeling
7. Request Oroville increased releases of at least 3,000 cfs, only if the benefit is supported by hydrodynamic evaluations; contact : Division of O&M Oroville Field Division Chief, 530-534-2323, or 530-534-2499 (24hr) \_\_\_\_\_
8. Request Shasta increased released of at least 4,000 cfs, only if the benefit is supported by hydrodynamic evaluations; contact : Shasta Dam – Operator: Area Office Manager, 530-275-1554, or 530-276-2188 (24hr)\_\_\_\_\_
9. Adjust all reservoirs on a daily basis based on hydrodynamic evaluations
10. Cease all increased reservoir releases if benefits to the Delta are not supported by hydrodynamic evaluations
11. Consider hydrodynamic evaluations to determine the benefit of releasing water from reservoirs for flushing channels after the Delta levee breaches are closed, and act according to the analyses

### **Constraints:**

- Entitlement to release water may be problem, especially from New Melones where there is very little discretionary water
- Flows from Folsom take about 1 day to reach the Delta
- Availability of water from Folsom may be limited

### **Related Actions:**

- Select Recovery Strategy
- Install/Remove Temporary Barriers
- Open Delta Cross-channel Gates

## **Comments:**

- Flows from New Melones take ½ to 1 day to reach the Delta
- Flows from Folsom take about 1 day to reach the Delta
- Flows from Oroville take 2 to 3 days
- Flows from Shasta take 3 to 5 days
- Consider analyses of the benefit of requesting reductions in Central Valley water diversions to provide flushing water after levee breaches are closed. This must be based on evaluation of real time conditions and must recognize that the request depends totally on voluntary cooperation by the diverters; an unlikely scenario
- Consider analyses of the benefit of requesting increasing releases from private East Side San Joaquin reservoirs to provide flushing water after levee breaches are closed. This must be based on evaluation of real time conditions and must recognize that the request depends totally on voluntary cooperation by the reservoir owners; an unlikely scenario

## A.12 Open Delta Cross Channel Gates

## Response 4.1.2

### **Responsible Party:**

DFM  
POC

**Condition:** Imminent or actual levee failure(s)

**Timeframe:** Immediately

**Duration:** As long as Sac. River <25,000 cfs

### **Response Action Description:**

Opening the Delta Cross Channel gates will allow fresh water to flow from the Sacramento River into the eastern part of the north, central, and south Delta. This will reduce salt intrusion into the Delta from the Suisun Bay as the islands/tracts with breached levees are flooding. After flooding is completed and water levels have stabilized, continued flow through the Cross Channel gates will aid flushing of salt from the Delta.

### **Procedure:**

1. Determine prior day X2 from [http://cdec.water.ca.gov/cgi-progs/selectQuery?station\\_id=CX2&sensor\\_num=145&dur\\_code=D&start\\_date=&end\\_date=now](http://cdec.water.ca.gov/cgi-progs/selectQuery?station_id=CX2&sensor_num=145&dur_code=D&start_date=&end_date=now)
2. If X2 is less than 65 km, stop – do not use this response action
3. If gates are closed at time of emergency and X2 is greater than 65 km, FOC request DOC to consult with CALFED Operations Group on need to open the gates
4. With concurrence of CALFED Operations Group, FOC and POC request the USBR Central Valley office to open the gates
5. FOC confirm benefits of continued operation with open gates within real-time Delta – hydrodynamic modeling
6. Keep CALFED Operations Group informed on ongoing gate position changes
7. FOC and POC request USBR to return to standard gate operation when need for open gates has passed

### **Constraints:**

- Operators may not have the discretion to open gates due to Delta standards that exist at the time of the emergency. O&M crews may need to improvise with use of portable generators or other methods based on their expertise
- During a large earthquake, operation of the Cross Channel gates may not be possible due to loss of power

### **Related Actions:**

- Select Recovery Strategy
- Install/Remove Temporary Barriers
- Release water from upstream reservoirs

- Reduce/Halt Water Diversions

**Comments:**

The following shows standard operation procedures for Cross Channel Gates in accordance with State Water Resources Control Board Decision 1641:

1. From November 1 through January 31. Gates will be closed for a total of up to 45 days for fisheries protection as requested by the US Fish & Wildlife Service (USFWS), National Marine Fisheries Service (NMFS), and Department of Fish & Game (DFG). Gates may be closed on very short notice and may be closed on weekends
2. From February 1 through May 20. Gates will be closed
3. From May 21 through June 15. Gates will be closed for a total of 14 days for fisheries protection as requested by the USFWS, NMFS, and DFG. Gates may be closed on very short notice. Whenever possible, gates will be open on the weekends (Saturday and Sunday) and the weekday holiday on Memorial Day weekend, but this cannot be guaranteed
4. From June 16 through October 31. Gates will generally be open, but this cannot be guaranteed. Hydrodynamic and fishery experiments have been conducted in the past and may continue in the future. These often require intermittent closures
5. High flows on the Sacramento River, unforeseen fishery protection actions or water quality compliance in the Delta may necessitate a short-term closure
6. USBR standing operation procedures call for gate closure when flow on the Sacramento River reaches the 20,000 to 25,000 cfs range
7. Gate opening and closing times are approximate, since an operator must travel to the site to perform the change. The opening and closing of the gates generally takes 30 minutes to one hour

## **A.13 Other Actions**

## **Response 4.3.1 & 4.5.1**

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### **Responsible Party:**

FOC (Primary)  
OA or Cal OES

**Condition:** Notice of Emergency

**Timeframe:** Immediately

**Duration:** Few hours to days

### **Response Action Description:**

Other Actions may include the following items that usually can be provided by the LMA/OA, which usually is the appropriate entity for making this request. In rare cases, the FOC may request direct Mission tasking through Cal OES to coordinate access to local law enforcement, CHP, Boating and Waterways, Cal Trans or USCG:

- Request restricted access to levee area watercourse
- Restricted access to road traffic to support plan implementation
- Obtain materials and supplies
- Access stockpiles
- OES Missions/Resources
- Security may be required for watercourse, levee, roadway, staging area, materials storage yard, field incident command post

### **Procedures:**

- The LMA/OA usually is the appropriate entity for making these types of requests. In rare cases, the FOC may request direct Mission tasking through Cal OES to coordinate access to local law enforcement, CHP, Boating and Waterways, Cal Trans or USCG
- To request restricted access to levee area watercourse and or road traffic to support plan implementation; the LMA/OA usually is the appropriate entity for making this request. The FOC may request direct Mission tasking through Cal OES to coordinate access to local law enforcement, CHP, Boating and Waterways or USCG
- Obtain materials and supplies: Complete an ICS 213RR. Complete the form as descriptively as possible to ensure the material requested is the material received; include size, weight, quantity, specifications, etc. Submit to the Logistics Section: Supply and Procurement Unit
- Access stockpiles: There are stockpiles of flood fight materials in the Delta. Upon approval by the FOC Director, the Logistics Section will contact the yard or facility to gain access to the materials
- OES Missions/Resources: Requests such as these must be initiated with an ICS 213RR (or the specialized Personnel or External Agency request forms). After authorization the Logistics Section will contact the LMA/OA representative to obtain the appropriate resource. During incidents that are solely state responsibility (State Maintenance Areas), The FOC may place Mission tasking (resource) requests directly to Cal OES

- Earthwork contracts: The Logistics Section: Ground Support works with the Finance/Admin Section: Procurement Unit, which has access to the Department's Division of Fiscal Services Offices for contract support
- Rip Rap contracts requiring barges or trucks: The Logistics Section, Ground Support works with the Finance/Admin Section, Procurement Unit, which has access to the Department's Division of Fiscal Services Offices for contract support
- Security: Security may be required for watercourse, levee, roadway, staging area, materials storage yard, field incident command post, etc.
- All requests for materials, equipment, supplies, additional personnel, and external agency support services must begin with a request form: ICS 213 RR – Supplies & Equipment Resource Request form, 213RR A Personnel Resource Request or 213RR EA External Agency Resource Request (under development). Each form must be completed as descriptively as possible to ensure that the needed resource is obtained. Each form must have all authorizations before submission to the Logistics Section. The request process must begin with the lowest level LMA/OA and work its way up to Cal OES and FEMA for state and federal resources. This does not prohibit direct conversations with the desired resource as a "heads up" or availability inquiry prior to submission of the documentation. Further instructions and details may be found in the Logistics Plan and the Flood Fight Materials Management Plan

### **Constraints:**

- Careful attention must be made to ensure every request that initiates any expense that may be eligible for State or Federal reimbursement is documented on a request form
- Careful attention must be made to ensure that requests for external resources go through the OA for all incidents involving LMA or local jurisdictions

### **Related Actions:**

Flood Fight

Activate Emergency Systems

Evaluate Situation

### **Comments:**

- Careful attention must be made to ensure documentation is maintained for all requests, grants to pass over restricted access areas or for other important issues. Documentation may be completed on an ICS 213 – General Message form or plain paper provided pertinent details of the transaction are recorded.

**Responsible Party:**

DFM with DOE  
POC, DOC

**Condition:** Flooded islands/tracts**Timeframe:** Begin after levee failure**Duration:** 1 day to several weeks**Response Action Description:**

Before any State participation in recovery of flooded islands/tracts, DFM will prepare a Recovery Plan(s) to define the sequencing of work and defining State participation. Initiating of preparation of the plan(s) may begin before a levee fails if there is reasonable expectation that failure will occur. Preparation time for the plan(s) will vary with the complexity (number of failures). The plan will be prepared in close coordination with Department management so decisions for actions can be made and action begun prior to completion of the entire plan – work on high priority sites can begin before the plan is complete.

The purpose of the plan preparation is to provide some time for thoughtful consideration of the actions that the State may take, rather than rushing to begin restoration without consideration of cost, State interest, environmental impacts/benefits, water quality, and many other issues. The plan will provide direction for how the State will participate in breach closure, pump out, and repairs – including combinations of these or no State participation in some cases. A plan for a single flooded island may be completed within a few days and a plan for many levee failures throughout the Delta involving a wide range of assets including critical infrastructure and water supply may take several weeks to complete.

**Procedure:**

1. Assemble data – real-time field conditions and base information in Supplement B
2. Estimate event consequences (cost and time for recovery and water supply impacts) based on procedure in JBA/RMA Engineering Report (2011) to inform Department management of order of magnitude of repair
3. Conduct hydrodynamic modeling of potential sequencing of repairs/recovers (DERT)
4. Conduct feasibility analysis to evaluate and define State participation in recovery (participation in proportion to State interest for breach closure and other potential actions). The analysis should include social, environmental, and other non-monetary benefits and include Legislative and Governor directives
5. Evaluate condition and select a response strategy (priorities)
6. Consider need to armor the edges of the levee breaches to prevent the breach from widening if the State has an interest in recovering the flooded island/tract
7. Obtain cost-share agreement and State hold harmless for any State assistance in recovery – State participation in pump out and other actions only if appropriate
8. Request public access to Delta waterways and transportation corridors be restricted as needed in areas to support plan implementation; contact OA or Cal OES

9. Request that land traffic around and through the Delta be restricted as needed in areas to support plan implementation; contact OA or Cal OES
10. Mobilize/dispatch repair contractors (marine and land based) as required – repair levee breaches in priority order based on selected recovery strategy
11. Develop stabilization plan and potential change of use for islands/tracts that will not be recovered [consider potential ecosystem enhancements]
12. Placement and removal of in-channel barriers only for earthquake Middle River Strategy for short duration –
13. Evaluate potential benefit of upstream reservoir releases to flush salt from Delta channels after levee breaches are closed

### **Constraints:**

- Water quality and environmental requirements may delay recovery of flooded islands/tracts. Depending on conditions, it may prove useful to request the Governor to relax these requirements if advantageous to recover assets of critical interest to the State
- Recovery of most Delta islands/tracts may not be justified solely from a State perspective. The State will consider cost-sharing with other entities in proportion to how its interests are benefited by the recovery
- Economic evaluation, however brief, is required prior to the State participating in island/tract recovery. The evaluation will also include consideration of environmental, social, and other non-monetary benefits
- An agreement that specifies cost-sharing arrangements together with provisions that hold the State harmless is required before the State participating in island/tract recovery

### **Related Actions:**

- Install/Remove Temporary Barriers
- Release water from upstream reservoirs
- Open Delta Cross-channel Gates

### **Comments:**

- The State may choose not to recover some flooded islands/tracts. Section 12981 of the CWC was amended whereby the State Legislature now recognizes that it may not be economically justifiable to maintain all Delta islands

## A.15 Reduce/Halt Water Diversions

## Recovery 5.3

### **Responsible Party:**

FOC  
POC

**Condition:** Imminent or actual levee failure(s)

**Timeframe:** Immediately with low Delta inflow

**Duration:** As supported by salinity analyses

### **Response Action Description:**

Levee failure(s) can pull salt water into the Delta from the downstream Suisun Bay as islands/tracts fill with water. Reducing or halting water diversions and exports prior to or during island/tract flooding can lessen the salt water intrusion. This response action should be used in drier conditions when X2 is greater than 65 km. This action is not used when levees fail from high Delta inflows during the winter.

### **Procedure:**

1. Determine prior day X2 from [http://cdec.water.ca.gov/cgi-progs/selectQuery?station\\_id=CX2&sensor\\_num=145&dur\\_code=D&start\\_date=&end\\_date=now](http://cdec.water.ca.gov/cgi-progs/selectQuery?station_id=CX2&sensor_num=145&dur_code=D&start_date=&end_date=now)
2. If computer access to CDEC is not available, estimate X2 from following Table. Use the 5th column if year is judged to be very wet. Use the “Mean” column if the year is judged to be about average. Use the 95th column if the year is judged to be very dry

Historic Location of X2 (in km) by Month

	<b>5th</b>	<b>Mean</b>	<b>95th</b>
January	58.9	77.2	86.0
February	51.3	71.1	83.7
March	50.5	65.3	78.1
April	48.3	64.9	78.0
May	51.6	67.7	79.0
June	54.8	70.7	81.9
July	58.1	74.6	82.1
August	67.5	78.1	85.5
September	77.7	83.6	86.7
October	73.8	85.3	89.2
November	74.0	85.3	87.8
December	67.1	83.1	88.1

1. If X2 is less than 65 km, stop – do not use this recovery action
2. If X2 is between 65 km and 70 km and actual or expected flooded volume is less than 200,000 acre-feet, stop – do not use this recovery action

3. Request Contra Costa Water District (CCWD) Old River and Rock Slough diversions be curtailed – contact CCWD
4. Request Clifton Court Forebay gates be closed
5. Request Banks Pumping Plant diversions be reduced to the minimum rate consistent with the protection of aqueduct condition and completely curtailed when possible
6. Request C.W. “Bill” Jones Pumping Plant flows be reduced to minimum and be curtailed when possible
7. Request in-Delta water diversions be curtailed
8. Revise need for above with real-time monitoring of water quality and hydrodynamic modeling
9. Restart diversions and exports only when supported by analysis and salinity standards are met

### **Constraints:**

- The Clifton Court Forebay gates may not be operable after a major seismic event. O&M crews may need to improvise with use of portable generators or other methods based on their expertise
- To protect the integrity of the Delta Mendota Canal, USBR may need to maintain operation of one pump (900 cfs) at C.W. “Bill” Jones Pumping Plant for some period
- Routing of remaining Forebay water to the South Bay Aqueduct may become a priority if lengthy export disruption is foreseen

### **Related Actions:**

- Select Recovery Strategy
- Install/Remove Temporary Barriers
- Release Water from Upstream Reservoirs
- Open Delta Cross-channel Gates

### **Comments:**

- A major earthquake may interrupt power supply, causing automatic stopping of some or all diversions
- Prior action plans have included the potential of opening Clifton Court Forebay gates on the next high tide to capture fresh water still in the channels. This potential action is not advisable since it is inconsistent with halting diversions or releasing reservoir water to reduce the potential for salt intrusion

**Responsible Party:**

DFM, DOE  
POC, DOC

**Condition:** Levee breaches**Timeframe:** Only supported by analyses**Duration:** As needed**Response Action Description:**

If temporary agricultural or fish barriers are in place and export pumping has been halted, consider removal of the temporary barriers to facilitate improved South Delta channel circulation and flushing. Generally, removal may be advisable with low Delta inflow. Confirm a beneficial impact with incident-specific hydrodynamic modeling before implementation.

In addition, installation of temporary barriers may be advisable under dry conditions recovery follows the Middle River Corridor strategy. This strategy is only employed if Delta exports are projected to be curtailed for extended periods of time and benefits of installing the barriers is confirmed by detailed hydrodynamic modeling.

**Procedure:**

1. Consider hydrodynamic modeling results on the advantages of removal of temporary agricultural or fish barriers and remove barriers as appropriate to aid Delta circulation
2. If the fish barrier at the head of Old River is removed, coordination should occur with the fish agencies through the California /Federal Bay Delta Program (CALFED) Operations Group before removal
3. If confirmed by hydrodynamic modeling and Middle River Corridor is chosen for recovery, install temporary channel barriers in locations supported by the modeling. Site conditions, material quantities, and construction costs of potential barriers installed during flood emergencies are shown in DWR Delta Emergency Channel Closure Locations Study (June 2012)
4. If the temporary barriers are installed in support of the Middle River Corridor strategy, remove the barriers before the winter flood season
5. Reinstall the temporary South of Delta temporary barriers (agricultural and fish) per normal operating schedule when Delta exports resume

**Constraints:**

- The temporary barriers to support the Middle River Corridor strategy should only be installed under rare circumstances and only for portions of a and in locations supported by analyses
- Potential environmental concerns

## **Related Actions:**

- Select Recovery Strategy

## **Comments:**

- Removal of the agricultural barriers should not be a problem since Delta agricultural diversions should already be stopped
- The benefit of removing the temporary agricultural and fish barriers will vary based on specific Delta levee breach locations and Delta inflows, especially from the San Joaquin River
- Ideally, the temporary barriers to support the Middle River Corridor strategy could be more beneficial if they could be installed quickly before the islands/tracts with breached levees are fully flooded. Unless closure material was prepositioned at each barrier site, several weeks may be required to install the barriers. Consider future actions to speed installation of the barriers
- Barriers in Steamboat Slough and on the Sacramento River (part way across the channel) downstream from Georgiana Slough would help force water into the Central Delta. These may be used with or without the other temporary barriers along Middle River
- Consideration to installing a temporary barrier on the San Joaquin River upstream of Rough and Ready Island may assist in salinity control by improving flushing – only if its benefits are supported by hydrodynamic modeling. This barrier could have a number of features including culverts with flap gates on the upstream end, provision for overflow, and ability to be removed to prevent flooding during high flows on the San Joaquin River

## A.17 Restore/Clean-up Levee, Staging Areas, Repair Sites

### Recovery 5.4

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**Responsible Party:**

LMA (Primary)  
FOC

**Condition:** Completion of repair

**Timeframe:** After completion

**Duration:** Whatever is approved in plan

**Response Action Description:**

Each staging area, ICP, or repair site must be restored to a level equal to or better than pre-repair condition.

**Procedure:**

- Restore levee, worksites and staging areas to pre-repair condition
- Report left-over materials to the Logistics Section, flood fight materials are left for the LMA/OA per the Flood Fight Materials Management Plan
- Remove temporary earthwork, structures and equipment
- After completion of emergency repair, research and report residual hazards requiring permanent repairs to the OA and to the FOC
- Equipment must be returned to the appropriate agency or storage area per the Logistics Plan
- Site should be reviewed by Environmental Officer or Specialist assigned to the incident upon final clearing of staff and equipment

**Constraints:**

- Budgetary, environmental, historical and water quality concerns are addressed during the response phase
- Cleanup is part of the cost of the repair

**Related Actions:**

- Flood Fight
- Install/Remove Temporary Barriers

**Comments:**

- Agreements with OA or LMA concerning restoration and or clean-up of levee must be documented

**Edmund G. Brown Jr.**

Governor  
State of California

**John Laird**

Secretary  
California Natural Resources Agency

**Mark Cowin**

Director  
Department of Water Resources

For additional information, contact  
Bill Croyle  
(916) 574-2611  
wcroyle@water.ca.gov

Or, visit us on the Web at:  
[www.water.ca.gov/floodmgmt/hafoo/fob/dfeprrp/](http://www.water.ca.gov/floodmgmt/hafoo/fob/dfeprrp/)



Prepared by GEI Consultants, Inc. for The California Department of Water Resources  
Naser Bateni, Program Manager (PE 36128)



PUBLIC SAFETY

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