



Levee Performance Scope Definition Work Group Summary of Existing Materials

Deliverable 1 – Key Factors

Review and update the list of key factors that affect levee performance and should be covered in the 2012 Central Valley Flood Protection Plan to create a successful plan. Prioritize the list into 3 levels of importance (essential, important, nice to have).

Geotechnical Factors

- Levee geometry
- Through-seepage
- Under-seepage
- Stability
- Erosion
- Settlement
- Seismic vulnerability
- Penetrations
- Geomorphology
- Encroachments
- Rodents
- O&M (Also covered by O&M Work Group)

H&H Factors

- Design discharge and design water surface elevation
- Freeboard
- Conveyance capacity
- Alignment (conveyance capacity)

Climate Change Factors (Also Covered by Climate Change Work Group)

- Change in peak runoff magnitude
- Change in time-to-peak
- Change in volume of runoff
- Sea-level rise

Vegetation Factors (Also Covered by O&M Work Group)

- Water-side bench (capacity, energy dissipation, scour retardation, etc.)
- Levee integrity (damage to levee prism, seepage etc.)
- Corps compliance
- O&M



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Deliverable 2 – Existing Problems and Expected Future Challenges

Review and update the list of existing problems and expected future challenges related to levee performance within the CVFPP project area. Additional details about the identified problems and future challenges will be developed and captured in the Regional Conditions Summary Work Groups.

Geotechnical Problems and Challenges

- Existing levee deficiencies
- 200-year geotechnical design criteria
- Non-urban geotechnical design criteria
- Levee geometry deficiencies
- Rodent control, damage identification and remediation
- Erosion deficiencies
- Probabilistic Corps levee evaluation criteria (geotechnical)
- Evolving Corps seismic criteria versus state criteria
- Changing Corps levee performance criteria
- FEMA criteria versus Corps criteria
- Incorporation of environmental features into existing levees or designs
- Seismic remediation
- Land use (e.g. subsidence in the Delta, toe ditches, etc.)

H&H Problems and Challenges

- Non-urban H&H design criteria, including climate change
- Existing design and performance criteria
- Through-seepage deficiencies
- Under-seepage deficiencies
- Settlement deficiencies (primarily in Delta)
- Stability deficiencies (primarily in Delta)
- Encroachment deficiencies
- 200-year H&H design criteria, including climate change
- Probabilistic Corps levee evaluation criteria (H&H)
- FEMA criteria versus Corps criteria
- Land use (e.g. urbanization, deleterious land use practices, etc.)

Climate Change Problems and Challenges (Also covered by Climate Change Work Group)

- Non-urban H&H design criteria, including climate change
- Existing design and performance criteria
- Through-seepage deficiencies

Vegetation Problems and Challenges (Also Covered by O&M Work Group)

- Non-urban H&H design criteria, including climate change
- Existing design and performance criteria



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- Through-seepage deficiencies
- Vegetation management and Corps compliance

Other Problems and Challenges (Also Covered by O&M Work Group)

- Accessibility
- Permitting
- Financial sustainability
- Affordability
- Levee ownership

Deliverable 3 – Reference material

Review and update a list of previously provided material to create a comprehensive list of available documents to use as reference material related to levee performance problems, opportunities, and standards.

At present, the DWR Non-urban Levee Evaluation (NULE) Project has collected approximately 8,000 documents.

Categories include:

- Historical design documentation
- Historical (past) performance documentation
- Geotechnical analyses documentation
- Maintenance Inspection records
- Design Standards (USACE and DWR)
- Annual field reconnaissance (USACE and DWR)
- System improvements (annual and/or emergency)

Deliverable 4 – Levee Performance Evaluation Activities

Review and update a list of previously compiled levee performance evaluation activities to develop a comprehensive list of other levee performance evaluation activities that the CVFPP Plan Development Team should become familiar with and coordinate with regularly.

DWR

- **Ongoing Activities**
 - Urban Levee Geotechnical Evaluation Program
 - USACE/SAFCA/DWR Research Collaborative
 - Construction inspections
 - CVFPP inspections, reviews, permitting activities
 - Assembly Bill 156 Levee Conditions Survey



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- Levee Maintenance Authority(ies) Inspection Reports (DWR; LDs; RDs,)
- Urban Levee Geotechnical Evaluations – Geotechnical Data Reports (varies, 2008/09)
- **Completed Activities**
 - FloodSAFE Strategic Plan – Public Review Draft (June 2008)
 - Sacramento and San Joaquin River Basins California, Comprehensive Study – Interim Report (December 2002)
 - California Flood Management Task Force, Management Report (December 2002)
 - Delta Risk Management Strategy – Phase I Report (February 2009)
 - Sacramento and San Joaquin River Basins, California, Post-Flood Assessment (March 1999)
 - Final Report – Governor’s Flood Emergency Action Team (May 1997)
 - San Joaquin River System Levee Repair Prioritization Report (December 2007)
 - Flood Warnings: Responding to California’s Flood Crisis (2005 White Paper; January 2005)
 - California Levee Roundtable - California’s Central Valley Flood Control Improvement Framework (February 2009)
 - Third Draft Interim Levee Design Criteria for Urban and Urbanizing Area State-Federal Project Levees

U.S. Army Corps of Engineers

- **Ongoing Activities**
 - Annual Project levee inspections
 - Levee Identifiable Inadequacies Flooplain Management (Joint DWR-USACE GIS database)
 - System Analysis of State Plan of Flood Control
 - Sacramento River Bank Protection Project, California (Flood control system maintenance repairs construction authority)
 - Sacramento San Joaquin Delta CALFED Levee Stability Program
 - Sacramento San Joaquin Delta – Delta Islands and Levees Feasibility Study
 - Sutter County Feasibility Study, Sutter County, California
 - Lower American River Common Features General Reevaluation Report (Feasibility study)
 - Sacramento River Bank Protection, Phases II and III (Future maintenance authority projects)
 - West Sacramento General Reevaluation Report (Feasibility study; starting 2009)



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- Lower San Joaquin River Feasibility Study (with San Joaquin Area Flood Control Agency)

- **Completed Activities**
 - Lower Cache Creek Feasibility Study (March 2003)
 - Yuba River Basin Project, California (Feasibility Study, April 1998)
 - Sacramento River Flood Control Project, California, Mid-Valley Area, Phase III (August 2005)
 - San Joaquin River Restoration Program – Initial Program Alternatives Report (June 2008)