ADDENDUM TO:
SUPPLEMENT TO STANDARD
OPERATION AND MAINTENANCE MANUAL
SACRAMENTO RIVER FLOOD CONTROL PROJECT

UNIT NO. 144
WEST LEVEE OF FEATHER RIVER
FROM NORTH BOUNDARY OF LEVEE DISTRICT NO. 1
TO NORTH BOUNDARY OF RECLAMATION DISTRICT NO. 823
(MAINTENANCE AREA 3)

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SECTION 1 GENERAL

This Operation and Maintenance Manual (O&M Manual) Addendum has been prepared by Levee District No. 1 of Sutter County (LD1) to address operation and maintenance requirements for the improvements constructed at the west levee of the Feather River at Star Bend. These improvements were constructed as part of LD1's Lower Feather River Setback Levee at Star Bend project. Presented on Figure 1 is a map of the Setback Levee area at Star Bend.

The new setback levee consists of a 20 to 25-foot high earthen levee beginning at the intersection of Star Bend Road and the existing right bank of the Feather River (Levee Mile 4.50) and continuing in a southeasterly direction to the approximate intersection of the extension of Tudor Road with the Right bank of the Feather River (Levee Mile 3.75). The total length of the setback is approximately 3,300 feet. The project is located within the limits of Sutter County, northeast of the intersection of State Highway 99 and the Garden Highway, south of Yuba City, Township 13 North, Range 3 East.

The setback levee geometry consists of a levee top width of approximately 20 feet, and side slopes that are 1 vertical to 3 horizontal. The foundation of the levee was excavated to provide an inspection trench (approximately 12 to 15 feet wide by 2 feet deep), and to construct a soil-bentonite (SB) cutoff wall to a depth of up to 65 feet below existing grade. The embankment was constructed with homogenous material meeting the type, permeability, and gradation requirements specified by U.S. Army Corps of Engineers and California Department of Water Resources criteria.

Soil-Cement-Bentonite (SCB) cutoff walls were constructed at the tie-ins to the existing levee. These walls overlap the setback levee foundation cutoff wall by a minimum of 50 lineal feet and extend into the existing levee embankments a minimum of 200 lineal feet. To install the cutoff walls, the existing levee was degraded to a depth equal to 1/3 the levee height (as measured from the landside toe). The cutoff wall was constructed to a depth of 58 feet from the cutoff wall

working platform at the north tie-in and 79 feet at the south tie-in. A total of 44,050 square feet of SCB Cutoff Wall and 181,076 square feet of SB cutoff wall were installed as part of the project.

Levee material for the project was obtained from the existing levee and borrow sources containing low-permeability soils within the O'Conner Lakes area, where material had been borrowed previously for the Shanghai Bend Setback Levee Project. Some additional material (approximately 51,000 cubic yards) was obtained from the Reclamation District 1001 borrow site located near State Highway 99 and Striplin Road (more specifically along Pacific Avenue). Material for construction of the slurry cutoff wall was excavated from the cutoff wall trench and mixed with bentonite slurry, cement (at the cutoff wall tie-in locations), and water to form an impermeable barrier three feet in width.

The completed setback levee was topped with an all-weather surface and levee embankments were protected by applying erosion control seeding. Existing levee embankment not borrowed for the construction of the new levee was disposed of by placing it as backfill at the on-site borrow sources.

This O&M Manual also incorporates, by reference, the following Supplement to the Standard O&M Manual for the Sacramento River Flood Control (SRFC) Project, which is included as Appendix A:

- Unit No. 144, West Levee of Feather River from North Boundary of Levee District No. 1 To North Boundary of Reclamation District No. 823.

This O&M Manual has been prepared in accordance with the guidelines contained in the USACE's Engineering Regulation ER 1110-2-401, *"Operation, Maintenance, Repair, Replacement, and Rehabilitation Manual for Projects and Separable Elements Managed by Project Sponsors."*

SECTION 2 AUTHORIZATION

The Setback Levee Project improves a segment of the Feather River West Levee, which is an element of the Sacramento River Flood Control Project (SRFCP). The SRFCP is a comprehensive plan for controlling the floodwaters of the Sacramento River and its tributaries that was authorized by the California Legislature in the Flood Control Act of 1911. The SRFCP was approved by Congress in the Flood Control Act of 1917 (PL 64-367).

The improvements at the Feather River west levee at Star Bend were authorized by the following Central Valley Flood Protection Board (CVFPB) permit:

- 18191 BD, issued on May 11 of 2009, containing the following language:

  "To remove approximately 4,500 linear-feet of existing project levee and construct a 3,400-linear-foot-long setback levee (LM 4.5 to 3.75) with a slurry cutoff wall; and modifying the existing pipelines at Star Bend on the right (west) bank of the Feather River. The project is located south of Yuba City, northeast of the intersection of Highway 99 and Garden Highway (Section 1&2, T13N, R3E, MDB&M, Levee District 1 Sutter, Feather River, Sutter County)".

The improvements were also permitted by the USACE by way of the following document:

- Memorandum from the USACE Director of Civil Works to the Commander of the South Pacific Division approving LD1's 408 application, dated June 1, 2009.

SECTION 3 LOCATION

Star Bend is located south of Yuba City at approximate River Mile 18 on the right (west) bank of the Feather River in Sutter County California. The closest street intersection to the project is

Star Bend Road at the Garden Highway. Specifically, the setback levee is located at Sections 1&2, T13N, R3E, MDB&M.

SECTION 4 PERTINENT INFORMATION

The setback levee was constructed using approximately 385,000 cubic yards of embankment material meeting the requirements of USACE Engineering Manual EM 1110-2-1913, "*Design and Construction of Levees,*" and Sacramento USACE District Standard Operating Procedure SOP-EDG-03, "*Geotechnical Levee Practice*." The material was obtained from degrade of the existing levee, and borrow sites as discussed under Section 1 above.

The foundation cutoff wall was constructed at the levee centerline, beneath the new setback levee prism, to reduce the hydraulic gradient and seepage flows to acceptable levels in accordance with USACE requirements. Included as Appendix B are the as-built drawings, which provide specific cut off wall alignment and depth information.

The Tudor Mutual Water Company (TMWC) owns and operates a pumping plant at Star Bend. The pumping plant also contains a pump owned and operated by Volcano Vista farms. Modifications to the pump station, and its water distribution and delivery system, were required to accommodate the project. One 18-inch and two 30-inch diameter welded steel pipelines pass over the levee (with approximately three feet of soil cover) near the TMWC distribution box at Star Bend Road. Each pipeline has been equipped with a positive closure device (gate valve) at the waterside levee top of slope. The purpose of the positive closure device is to provide a means of completely closing off the conduit in the event of high water. The gate valves are Resilient Seat Gate Valves as manufactured by the Clow Valve Company. Operation and maintenance information specific to this equipment is included as Appendix C. Each pipeline is also equipped with air relief valves at the waterside and landside top of slope. An overall Operation and Maintenance manual specific to the TMWC system has been prepared to address the pump station facilities.

The existing relief well pump station north of Star Bend Road was reconstructed to be placed outside of the setback levee footprint. The original pump station was installed as part of PL 84-99 improvements constructed by the USACE at Star Bend in 1997. This pump station conveys drainage generated from a series of relief wells located north of Star Bend road over the levee. Two new pipelines discharge flow over the levee and are equipped with combination siphon breaker/air relief valves. They are also equipped with flap gates at their point of discharge. The pump station sump was reconstructed to be identical to the original pump station configuration with the exception that the station has been modified to also accept some overland drainage flows from south of Star Bend Road. This drainage is conveyed by an 18-inch culvert beneath Star Bend Road to a manhole connection just upstream of the pump station inlet pipe's connection to the sump structure. Mechanical and electrical equipment was removed from the existing sump structure and installed at the new sump structure.

Existing irrigation pipelines were removed from under the setback levee footprint and backfilled with levee-grade material. Three utility poles providing electrical power to the Star Bend Pump Station were relocated away from the existing levee prism to allow it to be degraded as part of the project.

The project incorporated environmental enhancements, including the planting of elderberry shrubs waterward of the new setback levee. These habitat enhancements are maintained by an outside agency (River Partners, Inc.) and are not a part of this Operation and Maintenance manual. LD1 should remain diligent in ensuring these enhancements do not present a hindrance to ongoing maintenance of the levee system.

Four settlement monitoring gages were installed along the setback levee during construction. During the first season of the levee's operation, these gages should be monitored monthly. After the first season, and through the second season, the gages should be monitored every 3 months. Thereafter, the elevation reading should be recorded annually until subsidence readings indicate the levee has settled less than 0.1 foot over a twelve month period. The project design anticipated a total post-construction settlement of approximately four inches. Should the

settlement exceed this amount, an engineer should be consulted to evaluate the levee height with respect to the design water surface.

SECTION 5 CONSTRUCTION HISTORY

Construction of the project was awarded to Nordic Industries of Marysville, California in June, 2009. The project was designed by Wood Rodgers, Inc. and construction management was provided by MHM Engineers, Inc. Notice to proceed with construction occurred on or around July 6, 2009. Cutoff wall construction began with the northern SCB wall on July 17, 2009. Both SCB walls were installed early in construction to allow SCB material to cure as soon as possible. Once cured, the existing levee tie-in area and overlap portion of the SCB wall were degraded for tie-in of the setback levee foundation SB wall. Soil-bentonite wall installation began on or around July 30, 2009 and was complete on August 24, 2009. Earthwork began on or around August 22, 2009, and was complete on November 2, 2009. Completion of Star Bend pump station modifications continued into 2010.

SECTION 6 PROJECT PERFORMANCE

The project replaces a segment of the river's existing right bank levee that constrained flood flows in the Feather River and presented an unacceptably high risk for levee failure due to levee seepage. Construction of the setback levee removed this constraint and reduced water surface elevations and velocities along the levees upstream of the project site. Modeling analyses performed during the project feasibility phase indicated that a break in the Feather River west levee at Star Bend would inundate the Sutter Basin (including portions of Yuba City) in a matter of days. As of the writing of the feasibility study, the area affected by a break at Star Bend includes 25,000 people, $262 million in property improvements, and $277 million in assessed land values.

The project was designed based upon the 1957 USACE hydraulic profile of the Feather River, which exceeds the 100-year and 200-year water surface elevations at Star Bend. During this

event, modeling of the design event indicates a Feather River stage of 64.15 feet msl (NGVD29) at the northern end of the project and a relatively uniform slope of the water surface to 65.86 feet msl (NVGD29) at the southern tie-in. The levee height as constructed provides at least three feet of freeboard above these elevations, plus additional height as required in FEMA 44 CFR Chapter 1, Section 65.10 of the National Flood Insurance Program.

During the 1957 flow event, the total design flow for the Feather River at Star Bend is approximately 300,000 cubic feet per second.

For the purposes of this manual, the term "flood" or "high water period" shall refer to flows when the water surface reaches or exceeds a reading of 56.2 at the Boyd's Landing gage (California Data Exchange Center gage FBL).

SECTION 7 PROJECT COORDINATION AGREEMENT

The project improvements were funded by a cooperative agreement between LD1 and the DWR. The source of the funds was the California Disaster Preparedness and Flood Prevention Bond Act of 2006; and the California Safe Drinking Water, Water Quality and Supply, Flood Control, River and Coastal Protection Bond Act of 2006, including a 30 percent cost-share furnished by way of LD1 and its local cost sharing partners (Yuba City, Sutter County, and other public and private interests).

Additional agreements regarding reimbursement of state and local funds expended for the project by the federal government have been established between LD1 and the USACE, as outlined in Section 104 of Public Law 99-662.

SECTION 8 OPERATION

The modified levee falls under the jurisdiction of the USACE and the CVFPB through the Sacramento and San Joaquin Drainage District. Responsibility for operation and maintenance of the improved levees belongs to LD1, under the supervision of the DWR. Operation of the

improved levees is to be carried out in the same way the existing levee system was operated and maintained prior to the improvements.

SECTION 9 EMERGENCY OPERATIONS

Emergency surveillance, communication, and chain of responsibility for the levees and associated infrastructure are to be under existing protocols of LD1, under the supervision of DWR, in the same way as the existing levee system. The emergency operations are as recommended in Section 8 of the USACE's "*Standard Operation and Maintenance Manual for the Sacramento River Flood Control Project,*" and Section 6 of the DWR's "*Superintendent's Guide to Operation & Maintenance of California's Flood Control Projects*." The levees should be patrolled during high water events as specified in these documents.

Particular attention should be given to monitoring the performance of the levee during high water events in the levee's first few years of operation, to ensure that they function as designed. Attention should be paid to any cracking or slumping of the waterside slope and crown. Additionally, erosion-protecting vegetation may not be fully established during the first few flood seasons. Wind and wave action could overtop the levee crown in the unlikely event that an extreme flood occurs in the first few years of operation. Significant erosion will be less likely to occur on the levee when sod cover is well established. After initial levee performance has been confirmed, general operation and maintenance inspection should continue.

Standard flood-fighting techniques should be employed during high water events and observed problem areas should be addressed promptly. Proper response during high water conditions will include measures to prevent erosion and the prompt repair of any wave wash or scour damage. Typical flood-fighting methods will include the following:

- High water patrolling and reporting of trouble spots.

- Wave wash protection of eroded landside slope.

- Caving bank protection.
- Scour hole repair.
- Topping of low or eroding spots on the levee crown using sandbags, lumber and sack, or mud box bulkhead construction.
- Flood barrier construction.
- Sandbagging to control boils that are issuing sediment.
- Brushing and sacking the landside levee slope.
- Draining the landside levee slope.

Suggested flood-fighting protocols are described in detail in the documents listed below.

- *"Standard Operation and Maintenance Manual for the Sacramento River Flood Control Project*;" revised May 1955, U.S. Army Corps of Engineers, Sacramento District.
- *"Superintendent's Guide to Operation & Maintenance of California's Flood Control Projects*," State of California, Department of Water Resources, Division of Flood Management, undated (Appendix D).
- *"Design and Construction of Levees*," U.S. Army Corps of Engineers, EM 1110-2-1913, 30 April 2000.

A good summary of flood-fighting methods is contained in the DWR publication entitled, "*Flood Fighting Methods,*" dated August 2003. This publication is included as Appendix E for reference.

SECTION 10 MAINTENANCE AND INSPECTION

A summary of inspection and maintenance requirements is shown in Table 1. The basic inspection and maintenance related to the project levees is as recommended in Section 4 of the USACE's *"Standard Operation and Maintenance Manual for the Sacramento River Flood Control Project,"* and Section 4 of DWR's *"Superintendent's Guide to Operation & Maintenance of California's Flood Control Projects.*" Unless specifically addressed herein, refer to these documents for further guidance.

Types of Inspection

Routine Inspection

Routine inspections should include observation of the levee crown and slope for evidence of soil erosion, animal burrows, weed infestation, tree growth, and other undesirable vegetative growth. Evidence of seepage and/or boils should be reported immediately and evaluated in a timely manner by a qualified engineer. Items to be observed and evaluated are described in more detail under "Inspection and Maintenance Guidelines" below. The inspection checklist provided in the USACE's *"Standard Operation and Maintenance Manual for the Sacramento River Flood Control Project,"* should be used for inspection reporting.

As indicated in the USACE's "Standard *Operation and Maintenance Manual for the Sacramento River Flood Control Project,*" inspections should be made:

- immediately prior to the beginning of each flood season to ensure the structural integrity of the levees, allowing sufficient time to complete necessary repairs;

- immediately following each major high water period;

- at intervals not exceeding 90 days; and

- at such intermediate times as may be necessary to ensure the best possible care of the levee.

Special Inspection

Special inspections are required immediately after significant natural events such as high water events and earthquakes, or as otherwise deemed necessary by operating or engineering personnel. These inspections should follow the same procedures and level of care as during formal routine inspections. Inspection of the levee should be performed after all earthquakes of notable intensity (i.e., able to be felt). The entire length of the levee should be traveled and particular attention should be given to observing the levee crown and slope for evidence of slumps, cracking, sagging, subsidence, liquefaction-induced boils, or other signs of levee or foundation deficiencies. Any slumps, cracks, sagging, or other damage should be immediately marked on the ground, reported, and evaluated by a qualified engineer. Specifically included are:

- Earthquakes measuring less than 5.0 on the Richter Scale; inspections shall be performed when the epicenter is within 3 miles of the project.

- Earthquakes measuring 5.0 to 6.0 on the Richter Scale; inspections shall be performed when the epicenter is less than 30 miles from the project.

- Earthquakes measuring 6.0 or higher on the Richter Scale; inspections shall be performed when the epicenter is less than 50 miles from the project.

- Inspections shall also be performed after any earthquake in which specific reports of damage are received.

Inspection and Maintenance Guidelines

Crown Roadways

The levee crown should be maintained and all crown roadways, ramps, gates, and access roads should be properly maintained and kept serviceable. This work involves periodically grading and gravelling road surfaces following the same procedures and requirements outlined in Section 4 of the USACE's "*Superintendent's Guide to Operation & Maintenance of California's Flood Control Projects*." Inspections will ensure that no ruts, pot holes, or other depressions are on the levee, except for minor depressions caused by levee settlement. The levee crown, embankments, and access road crowns should drain properly without any ponded water. Gates are particularly subject to vandalism and need to be repaired as needed.

The public does have access to the O'Conner Lakes area located waterward of the levee and managed by the California Department of Fish and Game. To the best of their ability, LD 1 staff should discourage vehicular and pedestrian traffic on the levees outside of the area designated for public access. If public use of the levee is observed, LD 1 staff should note the details and circumstances and report these activities to the proper authorities for action.

Rodent Activity

Squirrels and other burrowing rodents can threaten the structural integrity of levees by loosening soil, increasing the risk of erosion and sloughing, and increasing the likelihood of piping-type erosion failures. Therefore, a rodent control program should be implemented year-round for the modified levee. The rodent control program should use the same procedures and requirements as outlined in Section 5 of DWR's "*Superintendent's Guide to Operation & Maintenance of California's Flood Control Projects*."

Vegetation Management

Mowing, burning, spraying, and other vegetation management procedures should be implemented by LD1 as outlined in Section 3 of DWR's "*Superintendent's Guide to Operation & Maintenance of California's Flood Control Projects."*

Sod-forming grasses and ground covers that provide erosion protection and yet permit inspection and flood-fighting are permitted. Inspections should determine if there is good coverage of sod over the levees and note those areas that are deficient. LD1 staff should take no action, such as burning grass and weeds during inappropriate seasons, which may retard or destroy the growth of sod. Broadleaf weeds growing among desirable grasses should be controlled by selective herbicides. Ground cover should be maintained at 12 inches in height or less.

Trees and shrubs are not permitted to grow on the levee slopes or crown. Any plant that obscures the view from the crown of the levee to the toe where boils and leaks would be most likely to occur, should be removed. Any plants that may impede flood-fighting efforts, such as construction of sack rings to control boils, should be removed. All vegetation over 2 inches in diameter should be removed from an area that extends for 15 feet from the waterside and landside toes of the levee in accordance with USACE ETL 1110-2-571, "*Guidelines for Landscape Planting and Vegetation Management at Levees, Floodwalls, Embankment Dams, and Appurtenant Structures."*

In general, vegetation within any existing access easements landward and waterward of the levee toe shall be limited to groundcovers to allow unimpeded maintenance activities, inspections, and flood fighting. Vegetation should be maintained in such a manner as to allow for unimpaired passage and operation of maintenance equipment and flood-fighting efforts.

Erosion Control and Repair

All levee slopes should be inspected for soil erosion and animal burrows, including both the landward and waterward slopes of the levees. All vegetation that hampers this inspection should be eliminated. Dragging of the levee slopes to repair minor surface erosion or irregularities and prevent serious erosion should be performed on an as-needed basis. Procedures for dragging are outlined in Section 4.22 of DWR's "*Superintendent's Guide to Operation & Maintenance of California's Flood Control Projects*." More extensive erosion features should be repaired as outlined in Section 12 of this O&M Manual.

During and immediately after high water events, LD1 personnel should travel the length of the levee and observe the waterside slope and levee crown for indications of erosion. All erosion and scour holes resulting from high flows and wave action should be immediately repaired and areas promptly stabilized and revegetated, if needed.

Seepage

During routine inspections, LD1 personnel should travel the length of the levee and observe the lower levee slope and area along the toe for indications of seepage and boils. Any evidence of heavy seepage, sinkholes, and/or boils should be immediately reported and evaluated by a qualified engineer.

During and immediately after high water events, i.e. any event in which the river rises above the level that would subject the levee to water against its waterside slope, LD1 personnel should travel the length of the levee and observe the lower landside levee slope and area along the toe for indications of seepage and boils. Areas of heavy seepage and/or boils should be immediately reported and evaluated by a qualified engineer.

Cracking, Settlement, and Slips

During routine inspections, LD1 personnel should travel the length of the levee and observe the crown and levee slopes for indication of cracking, slumping, or localized slippage of the levee slope. Any cracks, scarps, or areas of subsidence should be immediately marked on the ground, reported, and evaluated by a qualified engineer.

Encroachments

During routine inspections, LD1 personnel should check to determine whether trash, debris, excavations, structures, or other obstructions are present within the project easement area. If non-permitted encroachments are observed, LD1 should contact the encroaching entity by mail and instruct them to remove the encroachment. LD1 should also notify the CVFPB for any non-permitted encroachments.

Riprap Revetments

As of the drafting of this O&M manual, there is no riprap revetments along the Star Bend setback levee.

Record Keeping

A permanent record should be maintained of all levee inspection and maintenance activities. Records should include dated inspection reports (in checklist form), conditions observed including a description of the specific locations, and maintenance actions taken.

SECTION 11 SURVEILLANCE

Surveillance of the levee shall be carried out as described in Table 1.

Table 1
Summary of Inspection/Maintenance/Surveillance Requirements for the NCC South Levee

O&M Activity	Requirement and Frequency	Responsibility
Inspections		
Routine Inspections	• At intervals not exceeding 90 days, immediately prior to the beginning of the flood season, immediately following each major high water period, and at intermediate times as may be necessary to ensure the best possible care of the levee. • Suggested intervals not exceeding 30 days during break-in period between October 2009 and October 2011.	LD1
Special Inspections	• After significant natural events such as earthquakes (floods addressed above). • As deemed necessary by operating or engineering personnel.	LD1
Maintenance/Surveillance		
Crown Roadway	• Maintenance as needed to keep crown roadways, ramps, gates, and access roads serviceable.	LD1
Rodent Control	• Year-round rodent control program.	LD1
Vegetation Management	• As needed.	LD1
Erosion Control and Repair	• As needed dragging of the levee slopes. • Inspection during and immediately after high water events. • Monitoring and repairing, as needed.	LD1
Seepage Monitoring	• During routine inspections (see schedule above). • During and immediately after high water events.	LD1
Crack and Slip Monitoring	• During routine inspections (see schedule above).	LD1

SECTION 12 REPAIR, REPLACEMENT, AND REHABILITATION

All required repair, replacement, and/or rehabilitation should be made as recommended in the USACE's *"Standard Operation and Maintenance Manual for the Sacramento River Flood Control Project,"* and to the specifications for the original project construction unless otherwise directed by the CVFPB.

Erosion Repair

Areas of significant erosion, as determined by a qualified Engineer, should be over-excavated and filled with compacted backfill. The material properties and compaction requirements for the backfill should be the same as specified for the original project construction. The repaired area should then be stabilized using an erosion mat or fabric, as approved by the engineer, and reseeded to reestablish the ground cover.

Crack Repair

All cracks in the levee crown or slopes should be repaired using the following procedures: (1) Remove and salvage the gravel surfacing material on the levee crown; (2) excavate the levee crown and/or slope along the crack to the full depth of the crack; (3) backfill with compacted clayey material placed in thin lifts and meeting the material property and compaction requirements for the original levee construction; (4) replace and compact the gravel surfacing over the levee crown; and (5) stabilize the repaired area on the levee slope using an erosion mat or fabric and reseed it to reestablish the ground cover.

Slip Repair

All slips in the levee crown or slopes should be repaired using the following procedures: (1) Remove and salvage the gravel surfacing material on the levee crown; (2) excavate and remove the entire slip or crack surface to ensure that the failure plane and all failed materials

(since these materials would thereafter only obtain residual strength) are completely removed; (3) backfill with compacted clayey material placed in thin lifts and meeting the material property and compaction requirements for the original levee construction; (4) replace and compact the gravel surfacing over the levee crown and;(5) stabilize the repaired area on the levee slope using an erosion mat or fabric and reseed it to reestablish the ground cover.

SECTION 13 NOTIFICATION OF DISTRESS

Notification of distress should be reported in accordance with ER 1110-2-101, "*Reporting of Evidenced of Distress of Civil Works Structures."*

SECTION 14 REFERENCES

USACE Engineer Regulations

ER 1110-2-401 Operation, Maintenance, Repair, Replacement, and Rehabilitation Manual for Projects and Separable Elements Managed by Project Sponsors, September 1994

ER 1110-2-101 Reporting of Evidenced of Distress of Civil Works Structures

USACE Engineer Manuals

EM 1110-2-1913 Design and Construction of Levees, April 2000

Other References

California Department of Water Resources; "*Proposed Interim Levee Design Criteria for Urban and Urbanizing Area State-Federal Project Levees*," Third Draft, May 15, 2009.

U.S. Army Corps of Engineers, Sacramento District; "*Geotechnical Levee Practice, SOP EDG-03."*

U.S. Army Corps of Engineers, Sacramento District; "*Standard Operation and Maintenance Manual for the Sacramento River Flood Control Project*," May 1955.

U.S. Army Corps of Engineers, ETL 1110-2-571; "*Guidelines for Landscape Planting and Vegetation Management at Levees, Floodwalls, Embankment Dams, and Appurtenant Structures."*

U.S. Army Corps of Engineers; "*Levee Owner's Manual for Non-Federal Flood Control Works, The Rehabilitation and Inspection Program, Public Law 84-99,"* March 2006.