



REPLY TO  
ATTENTION OF

**DEPARTMENT OF THE ARMY**  
SOUTH PACIFIC DIVISION, CORPS OF ENGINEERS  
1455 MARKET STREET  
SAN FRANCISCO, CALIFORNIA 94103

**AUG 30 2011**

CESPD-PDC

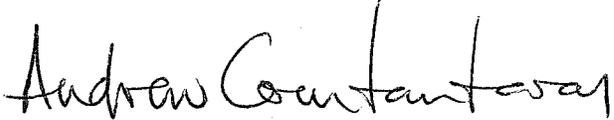
MEMORANDUM FOR Commander, Los Angeles District, ATTN: CESPL-PM-C, Mr. Thomas Bucklew

SUBJECT: Review Plan Approval for Santa Ana River Mainstem - Prado Dam, California, (including: Auxiliary Embankment and Floodwall, Alcoa Dike, Prison Dike, Yorba Slaughter Adobe Protection, and the River Road Dike and Floodwall)

1. The enclosed Review Plan for the Santa Ana River Mainstem - Prado Dam, California, (including: Auxiliary Embankment and Floodwall, Alcoa Dike, Prison Dike, Yorba Slaughter Adobe Protection, and the River Road Dike and Floodwall), was prepared in accordance with EC 1165-2-209, dated 31 January 2010. The review plan will require Independent External Peer Review Type II Safety Assurance Review (SAR).
2. The Review Plan will be made available for public comment, and the comments received will be incorporated into the Review Plan.
3. I hereby approve this Review Plan, which is subject to change as project circumstances require, consistent with project's development under the Project Management Business Process. Subsequent revisions to this Review Plan or its execution will require new written approval from this office.
4. The point of contact for this memorandum is Mr. Paul Bowers, 415-503-6556, [paul.w.bowers@usace.army.mil](mailto:paul.w.bowers@usace.army.mil).

***Building Strong from New Mexico all the way to the Pacific!***

Encl

  
Andrew Constantaras, P.E.  
Director, Regional Business Directorate

**REVIEW PLAN**  
**SANTA ANA RIVER MAINSTEM - PRADO DAM, CALIFORNIA**  
**(including Auxiliary Embankment and Floodwall, Alcoa Dike, Prison Dike, Yorba Slaughter Adobe Protection, and the River Road Dike and Floodwall)**

**LOS ANGELES DISTRICT**

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Prepared by:

U.S. Army Corps of Engineers  
Los Angeles District

Revised: August 24, 2011



**US Army Corps  
of Engineers** ®  
Los Angeles District



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**REVIEW PLAN**  
**SANTA ANA RIVER MAINSTEM – PRADO DAM, CALIFORNIA**  
**(including Auxiliary Embankment and Floodwall, Alcoa Dike, Prison Dike, Yorba**  
**Slaughter Adobe Protection, and the River Road Dike and Floodwall)**  
**LOS ANGELES DISTRICT**

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## REVIEW PLAN

### **SANTA ANA RIVER MAINSTEM - PRADO DAM, CALIFORNIA (including Auxiliary Embankment and Floodwall, Alcoa Dike, Prison Dike, Yorba Slaughter Adobe Protection, and the River Road Dike and Floodwall) Riverside & San Bernardino Counties, California**

**August 24, 2011**

#### **1. INTRODUCTION.**

a. Purpose. This document outlines the Review Plan for defining the scope and level of quality management activities and peer review for the Prado Dam element of the Santa Ana River Mainstem Project (SARM). Prado Dam is a separable element of the Santa Ana River Mainstem, CA project.

b. References.

- (1) ER 1110-2-1150, Engineering and Design for Civil Works Projects, 31 Aug 1999
- (2) ER 1110-1-12, Engineering and Design Quality Management, 21 Jul 2006
- (3) WRDA 2007 H. R. 1495 Public Law 110-114, 8 Nov 2007
- (4) EC 1165-2-209, Civil Works Review Policy, 31 Jan 2010
- (5) Army Regulation 15-1, Committee Management, 27 November 1992 (Federal Advisory Committee Act Requirements)
- (6) National Academy of Sciences, Background Information and Confidential Conflict Of Interest Disclosure, BI/COI FORM 3, May 2003

c. Review Requirements. This review plan was developed in accordance with EC 1165-2-209, which establishes the procedures for ensuring the quality and credibility of U.S. Army Corps of Engineers (USACE) decision and implementation documents through independent review. This Review Plan describes the scope of review for the current phase of work. All appropriate levels of review (DQC, ATR, IEPR and Policy and Legal Review) will be included in this Review Plan and any levels not included will require documentation in the Review Plan of the risk-informed decision not to undertake that level of review. The RP identifies the most important skill sets needed in the reviews and the objective of the review and the specific advice sought, thus setting the appropriate scale and scope of review for the individual project.

#### **2. PROJECT DESCRIPTION**

a. Project Authority. Construction of the Santa Ana River Mainstem project was authorized by Section 401(a) of the Water Resources Development Act of 1986. Section 401(a) authorized the project in the Phase I General Design Memorandum, except the Secretary of the Army was authorized to plan, design, and construct a flood control storage dam on the upper Santa Ana River,

in lieu of the Mentone Dam feature of the recommended project. The Phase II of the General Design Memorandum on the Santa Ana River Mainstem including Santiago Creek was subsequently completed by the District in August 1988. The WRDA of 1996 added language to the SARM project modifying the cost sharing and provided direction to determine whether the Prado Dam feature may be considered separable element. In 2002, approval was granted that the Prado Dam feature of the SARM project could be considered a separable element. Subsequent to that decision, a PCA was signed between the Corps of Engineers and the Orange County Flood Control District for the Prado Dam element of the Santa Ana River Mainstem, CA project.

b. Location and Description. The Prado Dam and Basin are located along a reach of Santa Ana River in the California Counties of Riverside and San Bernardino. As a separable element of the SARM project, the purpose of this element of the authorized project is to provide additional capacity for storage of floodwaters and sediment by enlarging the existing Prado Dam Reservoir. See Figure 1.

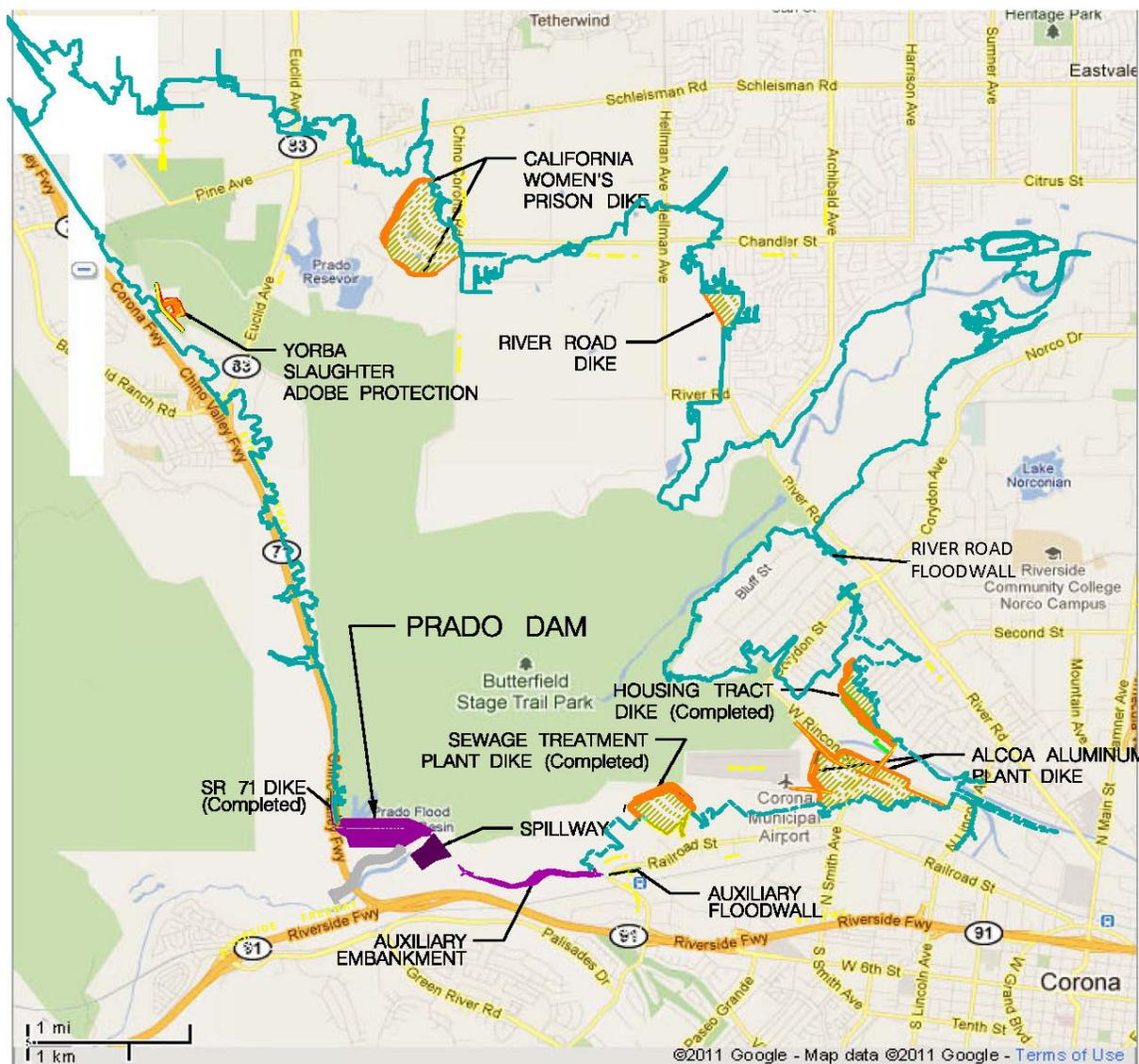


Figure 1 - Prado Basin Plan of Improvements

The plan of improvement includes: (1) Raising Prado Dam 28.4 feet, from elevation 566 to 594.4 feet National Geodetic Vertical Datum (NGVD); (2) constructing a new outlet works to more than triple the existing outlet capacity; (3) raising the concrete spillway from a crest elevation of 543 to 563 feet NGVD and increasing the crest length from 1,000 to 1,300 feet; (4) constructing levees to protect the Santa Fe Railroad (at the southern edge of the basin), the Corona Sewage Treatment Plant, the Alcoa Aluminum Plant on Rincon Street in Corona, and the California Institute for Women in Chino; and (5) stabilizing approximately 1.5 miles (2.4 km) of bluff along the Santa Ana River downstream of the Interstate 15 bridge in Norco, California. In addition, the Orange County Flood Control District prepared a Value Engineering Study which proposed project improvements in lieu of real estate acquisition. The VE recommendations that have been adopted into the project include constructing a 540' wall along River Road near Bluff Street, and constructing an earthen dike about 4,200' long, in lieu of purchasing additional rights-of-ways.

These improvements will increase the reservoir storage capacity from 217,000 acre-feet to 362,000 acre-feet. The flood damage reduction project will also provide the necessary improvements, identified in the Dam Safety program, to protect the embankment from overtopping during a probable maximum flood event. Construction of this project will essentially provide protection to lands and improvements within Orange County, downstream of Prado Dam.

### **3. WORK PRODUCTS TO BE REVIEWED**

a. Project Features. To date, construction of some of the Prado Dam project features have been completed, including the raising of the dam, construction of the outlet works, and construction of three dikes within the Basin. This Review Plan is intended to cover the design process and work products for the features described in the attached appendices. This Review Plan will be amended in the future to describe the review for the final construction features of Prado Dam, specifically the raising of the spillway.

b. Products for Review. Designs for the remaining Prado Dam features have been, or will be performed by a combination of AE Contractors and in-house SPL staff. Design products include Design Documentation Reports (DDR), Plans and Specifications (P&S), and Operation & Maintenance (O&M) Manuals. The Phase II General Design Memorandum for the Santa Ana Mainstem Project (GDM), dated August 1988, has been the basis of all the designs. While generally there are no significant departures from the GDM, separate DDRs for the major features will be prepared to document any changes which have evolved from design refinements, additional studies, and coordination comments. The proposed review level for each of the project features is identified in the feature appendix. The project features to be reviewed are:

- Auxiliary Embankment and Floodwall
- Alcoa Dike
- Prison Dike
- Yorba Slaughter Adobe Protection
- River Road Dike and Floodwall

c. Authorization & Reference Materials. Electronic versions of the documents, including the Phase II General Design Memorandum, dated August 1988, completed Design Reports, Value Engineering

Studies, and all relevant information available shall be posted in Adobe Acrobat PDF format for both the ATR Reviewers and the IEPR panel to review.

#### **4. SCOPE OF REVIEW**

a. District Quality Control (DQC). DQC is the review of basic science and engineering work products focused on fulfilling the project quality requirements defined in the Project Management Plan (PMP). SPL will continue to follow the Standard Operating Procedures as outlined in ER 1110-1-12 Quality Management where the DQC will consist of Quality Checks and Reviews, supervisory reviews, Project Delivery Team (PDT) Reviews including input from the Local Sponsor, and Biddability, Constructability, Operability and Environmental (BCOE) Reviews. The Independent Review function will be assumed by the ATR and IEPR processes.

b. Agency Technical Review. Agency Technical Review (ATR) is undertaken to "ensure the quality and credibility of the government's scientific information" in accordance with ER 1110-1-12. In order to insure incorporation of COE national experience for Flood Risk Management Projects (as updated per post-Katrina investigations), and in addition to the DQC, an ATR will also be performed. Moreover, all provisions and checklists for Safety Assurance Review (SAR) contained in EC 1165-2-209 will be incorporated into the charge to the ATR team.

(1) ATR Team responsibilities are as follows:

(a) Reviewers shall review project authorization material and the design documents to confirm that work was done in accordance with established professional principles, practices, codes, and criteria and for compliance with laws and policy. Comments on the design documents shall be submitted into DrChecks.

(b) Reviewers shall pay particular attention to one's discipline but may also comment on other aspects as appropriate. Reviewers that do not have any significant comments pertaining to their assigned discipline shall provide a comment stating this.

(c) Grammatical and editorial comments shall not be submitted into DrChecks. Comments should be submitted to the ATR manager via electronic mail using tracked changes feature in the Word document or as a hard copy mark-up. The ATR manager shall provide these comments to the Study Manager.

(d) Review comments shall contain these principal elements:

- a clear statement of the concern – identify the product's information deficiency or incorrect application of policy, guidance, or procedures;
- the basis for the concern, such as law, policy, or guidance – cite the appropriate law, policy, guidance, or procedure that has not been properly followed;
- significance for the concern – indicate the importance of the concern with regard to its potential impact on the plan selection, recommended plan components, efficiency (cost), effectiveness (function/outputs), implementation

responsibilities, safety, Federal interest, or public acceptability; and

- specific actions needed to resolve the comment – identify the action(s) that the PDT must take to resolve the concern.

(e) The “Critical” comment flag in DrChecks shall not be used unless the comment is discussed with the ATR manager and/or the Technical Project Leader first.

(2) PDT Team responsibilities are as follows:

(a) The team shall review comments provided by the ATR TEAM in DrChecks and provide responses to each comment using “*Concur*”, “*Non-Concur*”, or “*For Information Only*”. *Concur* responses shall state what action was taken and provide revised text from the report if applicable. *Non-Concur* responses shall state the basis for the disagreement or clarification of the concern and suggest actions to negotiate the closure of the comment.

(b) Team members shall contact the PDT and ATRT managers to discuss any “Non-Concur” responses prior to submission.

c. Independent External Peer Review (Safety Assurance Review)

(1) General. Per EC 1165-2-209, a Type II Safety Assurance Review shall be conducted on design and construction activities when a project:

- addresses hurricane and storm risk management or flood risk management;
- involves existing and potential hazards that pose a significant threat to human life;
- uses innovative materials or techniques;
- lacks redundancy, resilience, or robustness in the design; or has unique construction sequencing or a reduced or overlapping design/construction schedule

This applies to new projects and to the major repair, rehabilitation, replacement, or modification of existing facilities. External panels will review the design and construction activities prior to initiation of physical construction and periodically thereafter until construction activities are completed.

It is proposed that the Prado Dam features undergo the Safety Assurance Reviews (SAR) as described in the feature appendices. The objective of this review would be to assess, analyze, interpret, and evaluate design/engineering and construction criteria for the Prado Dam features during design and construction phases of the project.

(2) Type II IEPR Methodology

During the Design Phase, panel members shall evaluate/review the design submittals and provide their comments in DrChecks. The design submittals will be at various stages of completion, as defined in the feature appendices. Panel members will address key features and components to validate the state of the art approach being used to design and construct

the system.

For the Construction Phase, the IEPR shall evaluate/review construction activities to assure that the design assumptions made during the design phase remain valid through construction. The Panel shall visit the construction site for a 2-day trip to include the appropriate peer reviewers for the progress of construction to review critical construction operations. The visits should coincide with the mid points of construction and shall be documented with a Field Visit Report. The Field Visit reports will include a check list, photographs and text summarizing observations and information noted during each site visit. The Field Visit Reports shall be included in the Construction Final Report as an appendix. Operations and Maintenance Manuals will also be subjected to IEPR. The panel member selection will be re-evaluated for the review of the Operations and Maintenance Manual.

The EC 1165-2-209 will be used to manage and develop the charges for the IEPR panels. The results of the ATR will be provided to the IEPR panels. The charges to the IEPR panels will complement the ATR process and not duplicate it. The following excerpt from Appendix E of the draft EC is included as the basis for this methodology.

*“the intent of the reviews is to complement the existing process and to avoid impacts to program schedules and cost. Where appropriate and reasonable, the District can conduct the ATR and SAR concurrent and in concert if it enhances the review process. Every effort should be made to avoid having the SAR duplicate the ATR.”*

To insure independence and to obtain the required expertise, the IEPR panel members will be acquired via the A-E process or with an Army Research Office eligible organization such as Battelle Memorial Institute. Panel members will submit and comply with National Academy of Sciences, Background Information and Confidential Conflict Of Interest Disclosure, BI/COI FORM 3, May 2003.

### (3). Type II IEPR Questions

The Type II IEPR Panels will confirm that ATR has addressed the above questions and will address the following questions as part of their reviews.

- Do the assumptions made during the decision document phase for hazards remain valid through the completion of design as additional knowledge is gained and the state-of-the-art evolves?
- Do the project features adequately address redundancy, robustness, and resiliency with an emphasis on interfaces between structures, materials, members, and project phases?
- Do the assumptions made during design remain valid through construction?

For O&M manuals, do the requirements adequately maintain the conditions assumed during

design and validated during construction; and will the project monitoring adequately reveal any deviations from assumptions made for performance? The Panel Member assigned this review will be determined near the mid-point of the construction period.

## **5. REVIEW TEAM**

a. Agency Technical Review. The ATR team will be established per ER 1110-1-12 and EC 1165-2-209. The Corps will manage the ATR internally and it will be conducted by individuals and organizations that are separate and independent from those that accomplished the work, in accordance with policy. As stipulated in ER 1110-1-12, ATR members will be sought from the following sources: regional technical specialists (RTS); appointed subject matter experts (SME) from other districts; senior level experts from other districts; Center of Expertise staff; appointed SME or senior level experts from the responsible district; experts from other USACE commands; contractors; academic or other technical experts; or a combination of the above. The ATR Team Leader will be a Corps of Engineers employee outside the South Pacific Division. The required disciplines are described in the feature appendices.

b. IEPR Panels and Members To insure independence and to obtain the required expertise, the IEPR panels will be made up of independent, recognized experts from outside of the USACE in the appropriate disciplines, representing a balance of areas of expertise suitable for the review being conducted. Panel members will be acquired via the A-E process or with an Army Research Office eligible organization. Panel members will submit and comply with National Academy of Sciences, Background Information and Confidential Conflict Of Interest Disclosure, BI/COI FORM 3, May 2003

**6. PUBLIC COMMENT** To ensure that the peer review approach is responsive to the wide array of stakeholders and customers, both within and outside the Federal Government, this Review Plan will be published on the district's public internet site following approval by SPD at [http://spl.usace.army.mil/review\\_plans](http://spl.usace.army.mil/review_plans) . This is not a formal comment period and there is no set timeframe for the opportunity for public comment. If and when comments are received, the PDT will consider them and decide if revisions to the review plan are necessary. The public is invited to review and submit comments on the plan as described on the web site.

## **7. REVIEW SCHEDULE**

a. Schedule. Based on SPL's commitment to executing the SARM schedule for design and construction, milestones for the DQC, ATR and IEPR processes have been determined and are documented in each of the feature appendices. On projects scheduled for construction after FY10, the actual dates may have to be adjusted once the period draws closer.

b. ATR Funding. The Los Angeles District will provide labor funding by cross charge labor codes. Funding for travel, if needed, will be provided by way of a government order. The Project Manager will work with the ATR team leader to ensure that adequate funding is available and is commensurate with the level of review needed. The current cost estimate for these reviews is in the range of \$400,000 to \$510,000. Any funding shortages will be negotiated on a case by case basis

and in advance of a negative charge occurring.

The ATR team leader shall provide organization codes for each team member and a responsible financial point of contact (CEFMS responsible employee) for creation of labor codes. Reviewers shall monitor individual labor code balances and alert the ATR team leader to any possible funding shortages.

c. IEPR Funding . The scope of work for the IEPR, and the Independent Government Estimate, will be developed by the PDT, with support and review by the Risk Management Center (RMC) . It is anticipated that the total cost for the IEPRs identified within this plan will be approximately \$500,000, all a project cost that is 100% federally funded. The Los Angeles District will provide the funding to the IEPR panel and the RMC. The number of panel members proposed for the IEPR will be listed in each of the feature appendices. It is not anticipated that the public, including scientific or professional societies, will ask to nominate potential external peer reviewers.

## **8. DOCUMENTATION OF REVIEW**

a. ATR Communication and Documentation. The communication and documentation plan for the ATR is as follows:

(1) The team will use Document Review and Checking System (DrChecks) to document the ATR process. The Technical Project Leader will facilitate the creation of a project portfolio in the system to allow access by all PDT and ATR TEAM members. An electronic version of the documents, appendices, and any significant and relevant public comments shall be posted in Adobe Acrobat PDF format at: <ftp://ftp.usace.army.mil/pub/> at least one business day prior to the start of the comment period.

(2) The PDT shall send the ATR team leader one hard copy of the documents for each ATR team member such that the copies are received at least one business day prior to the start of the comment period.

(3) The PDT shall host an ATR kick-off meeting virtually to orient the ATR team during the first week of the comment period. If funds are not available for an on-site meeting, the PDT shall provide a presentation about the project, including photos of the site, for the team.

(4) The Technical Project Leader shall inform the ATR team leader when all responses have been entered into DrChecks and conduct a briefing to summarize comment responses to highlight any areas of disagreement.

(5) A revised electronic version of the documents with comments incorporated shall be posted at <ftp://ftp.usace.army.mil/pub/> for use during back checking of the comments.

(6) PDT members shall contact ATR team members or leader as appropriate to seek clarification of a comment's intent or provide clarification of information in the report. Discussions shall occur outside of DrChecks but a summary of discussions may be provided

in the system.

(7) Reviewers will be encouraged to contact PDT members directly via email or phone to clarify any confusion. DrChecks shall not be used to post questions needed for clarification.

b. ATR Dispute Resolution.

(1) Reviewers shall back check PDT responses to the review comments and either close the comment or attempt to resolve any disagreements. Conference calls shall be used to resolve any conflicting comments and responses.

(2) Reviewers may “agree to disagree” with any comment response and close the comment with a detailed explanation. If reviewer and responder cannot resolve a comment, it should be brought to the attention of the ATR team leader. If the ATR team leader is unable to resolve the issue, the ATR team leader will follow steps as described below.

(3) When resolution is not readily achievable, the RMO should engage the PCX or MSC subject matter experts (SMEs) to help facilitate resolution, and they in turn may choose to engage HQUSACE SMEs. If a specific concern still remains unresolved, the district is to pursue resolution through the policy issue resolution processes described in Appendix H, ER 1105-2-100; ER 1110-1-12, or other applicable guidance. HQUSACE may choose to defer the issue to the policy compliance review process or address it directly. The ATR shall be certified in accordance with ER 1110-1-12 when all ATR concerns are documented as either resolved or deferred by HQUSACE to a separate process.

(4) The Agency Technical Review team will identify significant issues that they believe are not satisfactorily resolved and will note these concerns in the Technical Review Certification documentation. The ATR team will prepare a Review Report which includes a summary of each unresolved issue. Review Reports will be considered an integral part of the ATR documentation.

(5) Significant unresolved ATR concerns that are documented by the RMO will be forwarded through the MSC to the HQUSACE RIT, including basic research of USACE guidance and an expression of desired outcome, for further resolution in accordance with the policy issue resolution process described in either ER 1110-2-12 or Appendix H, ER 1105-2-100, as appropriate. HQUSACE may choose to defer the issue to the policy compliance review process or address it directly. At this point the ATR documentation for the concern may be closed with a notation that the concern has been elevated for resolution by HQUSACE. Subsequent submittals of reports for MSC and/or HQUSACE review and approval shall include documentation of the issue resolution process.

c. ATR Certification. To fully document the ATR process, a statement of technical review will be prepared for each product reviewed. The ATR documentation will include the text of each ATR comment, the PDT response, a brief summary of the pertinent points in the ensuing discussion, including any vertical coordination, and the agreed upon resolution. Certification by the ATR team

leader and the Technical Project Leader will occur once issues raised by the reviewers have been addressed to the review team's satisfaction. Indication of this concurrence will be documented by the signing of a certification statement (Appendix F).

d. IEPR Communication and Documentation. The communication and documentation plan for the IEPR is as follows:

(1) The panel will use DrChecks to document the IEPR process. The Technical Project Leader will facilitate the creation of a project portfolio in the system to allow access by all PDT and the outside eligible organization (OEO). An electronic version of the documents, appendices, and any significant and relevant public comments shall be posted at: <ftp://ftp.usace.army.mil/pub/> at least one business day prior to the start of the comment period.

The OEO will compile the comments of the IEPR panelists, enter them into DrChecks, and forwards the comments to the District. The District will consult the PDT and outside sources as necessary to develop a proposed response to each panel comment. The District will enter the proposed response to DrChecks, and then return the proposed response to the panel. The panel will reply to the proposed response through the OEO, again using DrChecks. This final panel reply may or may not concur with the District's proposed response and the panels final response will indicate concurrence or briefly explain what issue is blocking concurrence. There will be no final closeout iteration. The District will consult the vertical team and outside resources to prepare an agency response to each comment. The initial panel comments, the District's proposed response, the panels reply to the District's proposed response, and the final agency response will all be tracked and archived in DrChecks for the administrative record. However, only the initial panel comments and the final agency responses will be posted. This process will continue to be refined as experience shows need for changes.

(2) The PDT shall send each IEPR panel member one hard copy (with color pages as applicable) of the document and appendices such that the copies are received at least one business day prior to the start of the comment period.

(3) The Technical Project Leader shall inform the IEPR panel when all responses have been entered into DrChecks and conduct a briefing to summarize comment responses to highlight any areas of disagreement.

(4) A revised electronic version of the documents with comments incorporated shall be posted at <ftp://ftp.usace.army.mil/pub/> for use during back checking of the comments.

(5) PDT members shall contact IEPR panel members as appropriate to seek clarification of a comment's intent or provide clarification of information in the report. Discussions shall occur outside of DrChecks but a summary of discussions may be provided in the system.

(6) The IEPR panel shall produce final Review Reports, including documentation of the peer

review of the Project Design and field visit reports on construction activities.

**9. POINTS OF CONTACT.** Questions about this Review Plan may be directed to the Los Angeles District Project Delivery Team, Design Lead Supervisor, Mr. Stephen H. Vaughn at (213) 452-3654, or to the Project Manager for the Santa Ana Mainstem Project, Mr. Oscar T. Bucklew at (213) 280-9511. The Chief, Engineering Division is Mr. Richard J. Leifield at (213) 452-3629. Inquiries to the MSC should be directed to the Mr. Paul Bowers at (415) 503-6556.

#### **10. REVIEW PLAN APPROVAL.**

In summary, the Los Angeles District proposes to fully comply with all existing guidance, to add ATR and conduct Type II IEPR in accordance with EC 1165-2-209. Approval of this plan as outlined above will help facilitate the District's completion of the Santa Ana Mainstem Project – Prado Dam features within the authorized schedule.

In order to ensure the Review Plan is in compliance with the principles of EC 1165-2-209, the Review Plan must be reviewed and approved by the applicable MSC, in this case the Commander, South Pacific Division (SPD).

The Review Management Office for these features of the Santa Ana Mainstem Project – Prado Dam is the Risk Management Center (RMC). Since the RMC is currently in the process of staffing up, the Los Angeles District and the South Pacific Division will work to supplement the RMC's efforts, as requested, by locating ATR team members from other Corps Districts and A/Es to provide the review services. The SPD should coordinate the review and approval of this review plan with the RMC.

Once the Review Plan is approved, the District will post it to its district public website and notify SPD. If necessary, any changes to the review plan will be approved by following the process used for initially approving the plan.

The Los Angeles District requests that the South Pacific Division endorse the above recommendations and approve this Review Plan as described in Appendix B of EC 1165-2-609.

\* \* \*



## APPENDIX A

### AUXILIARY EMBANKMENT AND FLOODWALL

#### A-1. FEATURE DESCRIPTION

The Auxiliary Embankment and Floodwall will be constructed under one contract beginning in 2010. The purpose of both the Auxiliary Embankment and Floodwall is to contain the reservoir pool during the design event and will act as an extension of the Dam embankment. The embankment will be a compacted earthen embankment extending from the south side of the spillway to the west side of Serfas Club Drive would be approximately 5,370 feet in length. The top width of the embankment would be 20 feet at elevation 594.8 feet. The maximum height of the embankment above the existing ground would be approximately 74 feet, with an average height of about 30 feet. The embankment would have side slopes of 1 vertical on 2.25 horizontal, and would have slope revetment consisting of 24-inch stone over 9 inches of bedding material and 6 inches of filter on the reservoir side.

The concrete floodwall would be provided along the north side of the railroad track from a point approximately 300 feet west of Serfas Club Drive, where the eastern end of the embankment is located, to a point 1,200 feet east of Serfas Club Drive where the existing ground is at elevation 595. The recommended floodwall would be constructed within a 20-foot wide dedicated easement located approximately 100 feet north of the existing railroad track. Wall heights would range from 16 feet at the western end to 2 feet at the eastern terminus.

Recently, the City of Corona was authorized to move forward with design and construction of a grade separation project for Serfas Club Drive which would eliminate the at-grade crossing with the BNSF Railroad tracks. Efforts are on-going to coordinate designs with the City as both the Auxiliary Embankment and Floodwall will tie into their new structure.

#### A-2. WORK PRODUCTS TO BE REVIEWED

a. Project Features. Designs for both the Auxiliary Embankment and the Floodwall were initiated back in 2008. SPL awarded a contract to an A/E Contractor, PB America Inc., to prepare a DDR and Plans and Specifications for the Auxiliary Floodwall; and SPL began the work on the Plans and Specifications for the Auxiliary Embankment with in-house staff. A copy of their Quality Control plan and certification is included at the end of this appendix.

b. Products for Review. District Quality Control activities for the Auxiliary Embankment and Floodwall features have been on-going. Being that both designs are in the final stages, this Review Plan proposes that only one additional review is required for the design products utilizing both the ATR and the IEPR. All review teams will review the following:

- Auxiliary Embankment & Floodwall Plans & Specifications
- Auxiliary Embankment and Floodwall Design Documentation Report

c. Reference Materials. An electronic version of the following documents will be provided:

- Phase II General Design Memorandum, dated August 1988
- Previous Design Review Documentation

### **A-3. SCOPE OF REVIEW**

a. District Quality Control. District Quality Control activities for the Auxiliary Embankment and Floodwall plans and specifications will consist of quality checks and reviews, supervisory reviews, Project Delivery Team (PDT) reviews, Local Sponsor review, and a BCOE Review as required by ER 1110-1-12.

b. Agency Technical Review. Agency Technical Review (ATR) will examine the Auxiliary Embankment and Floodwall plans and specifications, focusing on compliance with established policy, principles and procedures using clearly justified and valid assumptions. It includes the verification of assumptions, methods, procedures, and material used in analyses based on the level of complexity of the analysis. The ATR should verify the alternatives evaluated, appropriateness of data used and level of data obtained, functionality of the project and verify the reasonableness of the results including whether the project meets the customer's needs consistent with law and existing policy and engineering and scientific principles. The ATR should also determine if the proposed alternative is feasible and will be safe, functional, constructible, and environmentally sustainable within the Federal interest, and whether the concepts and project costs are valid. The final review will confirm whether all relevant engineering and scientific disciplines have been effectively integrated and that the content is sufficiently complete for the current phase of the project. The ATR team should also ensure that the Auxiliary Embankment design satisfies all of the concerns on the design and construction of the Corona Housing Dike and the Corona Treatment Dikes at Prado Dam that were raised at the January 2010 Dam Safety Senior Oversight Group review of SPRA projects.

c. Independent External Peer Review (Safety Assurance Review). The Auxiliary Embankment and Floodwall shall undergo an IEPR for the Construction Phases. The panel will validate the state of the art approach used to design and construct the system. In addition, the panel should focus on any unique features and changes from the assumptions made and conditions that were presented in the authorized Phase II GDM. During the construction phase, the panel should verify assumptions made during the design are still valid through construction; and for the O&M manual, whether the requirements specified maintain the conditions anticipated for the project to function properly in the future.

During the Construction Phase, a site visit shall be scheduled for the panel to evaluate/review construction activities. The panel's visit to the construction site will be a 2-day trip to include the appropriate peer reviewers for the progress of construction to review critical construction operations. The visit should coincide with the midpoint of construction and shall terminate with an exit briefing, which will be scheduled by the Project Manager and will be conducted at the Prado Resident Office. Each site visit shall be documented with a Field Visit Report. The Field Visit reports will include a check list, photographs and text summarizing observations and information noted during each site visit. The Field Visit Reports shall be included in the Construction Final Report as an appendix.

The Operations and Maintenance Manual will also be subjected to IEPR. The panel member selection will be re-evaluated for the review of the Operations and Maintenance Manual.

**A-4. REVIEW SCHEDULE**

a. ATR Schedule. The ATR process for the Auxiliary Embankment and Floodwall will follow the following timeline. Actual dates may have to be adjusted once the period draws closer.

Review Plan Approved by RMO (SPD)	7 May 10
A/E Submittal of Final DDR	10May10
District Quality Control Review of DDR	10May10 – 28May10
ATR Review	6Jun10 – 6Jul10
ATR Complete Back Checking	21Jul10 – 28Jul10
ATR Certification	28Jul10
Submittal of Final P&S Package	10May10
District Quality Control & BCOE Review	10May10 – 6Jun10
ATR Review	6Jun10 – 6Jul10
ATR Complete Back Checking	21Jul10 – 28Jul10
ATR Certification	28Jul10
BCOE Certification Complete	28Jul10
Advertise Construction Contract	4Aug10
Open Bids	4Sep10
Construction Contract Award	19Sep10

b. ATR Funding. The current cost estimate for the review of the Auxiliary Embankment and Floodwall design materials is in the range of \$65,000 to \$80,000.

c. IEPR Schedule. The IEPR process will follow the following timeline. Actual dates may have to be adjusted once the period draws closer.

Submittal of Design Package	1Sep11
Type II IEPR Review	1Sep11 – 30Sep11
Midpoint Construction	19Sep11
Construction Completion	22Sep12
IEPR Final Reports	Oct12

d. IEPR Funding. The RMC will identify someone independent from the PDT to scope the IEPR and develop an Independent Government Estimate. The Los Angeles District will provide funding to the IEPR panel and the RMC.

**A-5. REVIEW TEAM**

a. District Quality Control. Reference is made to the SARM QMP that identifies the activities, roles and responsibilities for the DQC of the Auxiliary Embankment and Floodwall.

b. Agency Technical Review Team Qualifications. The ATR team for the Auxiliary Embankment and Floodwall should be comprised of the following disciplines:

Hydrology and Hydraulics. The team member should be a registered professional with 10 or more years experience in conducting and evaluating hydrologic and hydraulic analyses for flood risk management projects. Experience with all aspects of hydraulic engineering including: hydraulic analyses and designs for spillways, outlets, stilling basins, approach channels, and diversion structures; water velocities, pressures, directions, trajectories, and erosion potential; and hydraulic modeling is desired. Experience with the Dam or Levee Safety program is also desired. Active participation in related professional societies is encouraged.

Geotechnical Engineering. The team member should have 20 or more years experience in geotechnical engineering in high seismicity regions. Team member must demonstrate significant experience in the geotechnical aspects of analysis, design and construction of flood risk management structures including earthen dams, floodwalls, and closure structures. Specific required earthen dam design experience includes assessing soil properties, static and dynamic slope stability, seepage analysis, deformation analyses, filter design, slope protection design, preparation of plans/specifications and instructions to field personnel. Required earthen dam construction experience includes diversion and control of water, foundation treatment and improvement, borrow operations, compaction and moisture conditioning methods, evaluating QA/QC and record test data, and evaluating earthwork construction and differing site condition claims.

Structural Engineering. The team member should have 10 or more years experience in structural engineering. Experience needs to include design and evaluations of large complex hydraulic structures associated with flood risk management projects. Experience with AASHTO and state road and bridge standards as well as practical knowledge of construction methods and techniques as it relates to structural portions of projects is encouraged.

Civil Engineering. The team member should have 10 or more years experience with large scale civil/site work projects to include levee systems, floodwalls, roads and highways, relocations, paving and drainage.

Construction Management/Operations. The team member should have 10 or more years experience of construction management in complex large scale public works projects, including coordinating efforts in horizontal construction, specializing in earthwork, concrete work, drilled piles, floodwalls, roads and highways, relocations, paving and drainage.

ATR Team Leader. The ATR Team Leader should have 10 or more years experience with Civil Works Projects and have performed ATR Team Leader duties on complex civil works projects.

c. IEPR Panel Qualifications. The IEPR panel should be comprised of members with the following expertise:

Hydrology and Hydraulics (H&H) Panel Member. The H&H Panel Member should be a registered professional from academia, a public agency, or an Architect-Engineer or consulting firm

with 15 or more years experience in conducting and evaluating hydrologic and hydraulic analyses for flood risk management projects. The Panel Member should be experienced in Flood Damage Reduction Projects, including large earth-fill, rock-fill, concrete or combination dams or systems of dams with their many hydraulic appurtenances such as gated and un-gated spillways, stilling basins, outlet works, control gates and valves, power intake structures, tunnels, conduits and approach and diversion channels and appurtenant control structures; and/or Local Flood Damage Reduction Projects including levees; floodwalls; gravity outlet and gate closure structures; pumping stations; detention basins; storm drainage structures; lined and unlined flood control channels and improvement structures. Active participation in related professional societies is encouraged.

Geotechnical Engineering Panel Member. The Geotechnical Engineering Panel Member should be a registered professional from academia, a public agency, or an Architect-Engineer or consulting firm with 20 years or more experience in geotechnical and earthquake engineering for critical flood risk management infrastructure and dam safety evaluations. The panel member should be a recognized expert in the geotechnical analysis and design of earthen dams and floodwalls, have experience in preparation of contract specifications, and demonstrate significant experience in the construction and safety evaluation of earthen dams.

Structural Engineering Panel Member. Structural Engineer should be a registered professional from academia, a public agency, or an Architect-Engineer or consulting firm with extensive experience in design of hydraulic structures for large and complex civil works projects including floodwalls and drainage features, etc.. Designs may involve unusual stresses because of size and shape, loading conditions resulting from unbalanced earth pressures, settlement and creeping of earth fills.

Civil Engineering Panel Member. The Civil Engineer should be a registered professional from academia, a public agency, or an Architect-Engineer or consulting firm with extensive experience in design of major flood control structures including earthen dams, levees, guide dikes and channels. Experience utilizing riprap protection, soil cement or concrete in design of levees, guide dikes and channels for large civil works projects is required. Practical knowledge of construction methods and techniques as it relates to these types of projects including earthwork, erosion control, hydraulic structures, interior drainage, site grading, roadwork, and concrete work is encouraged.

d. Review Team Roster. The Review Team Roster for the Auxiliary Embankment and Floodwall will include the following representatives:

Discipline/Role	Name	Agency/Office	Phone No.
SPL District PCT Leads include:			
Project Team Leader	Stephen Vaughn	CESPL-ED-DB	(213) 452-3654
SPL Project Manager	Thomas Bucklew	CESPL-PM-I	(213) 280-9511
Civil Engineer	Funke Ojuri	CESPL-ED-DB	(213) 452-3658
Structural Engineer	Ali Wahidi	PB America Inc.	(206) 267-6832

Civil Engineer	Jerry Sun	PB America Inc.	(213) 896-5639
Structural Engineer	Nirav Patel	CESPL-ED-DS	(213) 452-3746
Geotechnical Engineer	Doug Chitwood	CESPL-ED-GD	(213) 452-3587
Materials Engineer	Francis Omoregie	CESPL-ED-GI	(213) 452-3599
Hydraulic Engineer	Robert Castle	CESPL-ED-HH	(213) 452-3557
Cost Engineer	Juan Dominguez	CESPL-ED-DS	(213) 452-3737
Construction Engineer	Joseph Flynn	CESPL-CO-GS	(951) 898-6151
Construction Engineer	Hugh Brown	CESPL-CO-GS	(951) 898-6142
Landscape Architect	Thomas Luzano	CESPL-ED-DA	(213) 452-3651
Environmental	Hayley Lovan	CESPL-PD-RL	(213) 452-3863
Real Estate	Dan White	CESPL-AM-	(213) 452-3128

ATR Team includes:

ATR Team Leader	Jacob Owen	CENWK-ED-DT	(816) 389-3314
Civil Engineer	Tom Catarella	CESPK-ED-DC	(916) 557-7269
Geotechnical Engineer	Brian Farmer	CELRP-EC-DS	(412) 395-7325
Geotechnical Engineer	Ken Pattermann	CESPK-ED-GP	(916) 557-6980
Hydraulic Engineer	Harold Huff	CESPK-ED-HD	(916) 557-6946
Structural Engineer	Roger Zemba	CESPK-ED-DS	(916) 557-6616
Structural Engineer	Marcus Williams	CESPK-ED-DS	(916) 557-6819

IEPR Panel includes:

Hydraulic Engineer			
Geotechnical Engineer			
Structural Engineer			
Civil Engineer			

## A-6. A-E QUALITY CONTROL

a. A-E Quality Control. As stated above, SPL awarded a contract to an A/E Contractor, PB America Inc., to prepare a DDR and Plans and Specifications for the Auxiliary Floodwall. Reference is made to the signed quality control certification and quality control plan for the design of the Auxiliary Floodwall shown below.

**A-E STATEMENT OF COMPLETENESS**  
Task Order No. 0010 – Floodwall Final Design

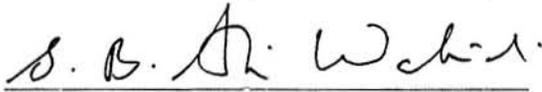
PB Americas, Inc. has completed the Prado Auxiliary Dike Floodwall Final Design which includes the design and detailing of the alternative selected from the Prado Auxiliary Dike Floodwall Alternatives Study completed previously. Nine various alternatives were originally evaluated, and a final four group of options were reviewed in greater detail. The recommended alternative which was selected as the final design is the Cantilever T-wall with drilled shafts. This alternative meets all of the US Army Corps of Engineers design standards and was reviewed for feasibility, constructability, maintenance, and life cycle of 100 years.

The Cantilever T-wall with Drilled shafts was evaluated based upon the following design factors:

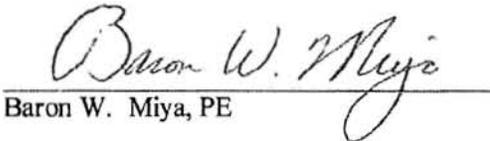
- Existing geotechnical conditions;
- Bearing capacity and sliding;
- Seepage analysis;
- Lateral earth pressures;
- Ground settlement;
- Vibrations during construction;
- Constructability given the 20 feet wide easement;
- Impacts to existing structures and properties;
- Maintenance;
- Scour potential;
- Aesthetics considerations given that the floodwall is immediately adjacent to the Corona Metrolink Station and abuts adjacent commercial properties;
- Environmental impacts; and
- Water tightness.

The initial Design Documentation Report for the Alternatives Study contained general descriptions and assumptions; calculations; cost estimates; quality control reviews including independent technical reviewer comments concerning the soils/cement option; and meeting minutes. Along with this information, this updated report includes the final design process; calculations; updated cost estimates; an Independent Technical Review (ITR) of the design; and additional comments and meeting minutes that have been compiled since the completion of the Alternatives Study.

The undersigned has reviewed and recommends the contents contained in the Prado Auxiliary Dike Floodwall Design Documentation Report.

  
\_\_\_\_\_  
S. B. Ali Wahidi, SE

10/27/10  
\_\_\_\_\_  
Date

  
\_\_\_\_\_  
Baron W. Miya, PE

10/27/10  
\_\_\_\_\_  
Date

PRADO AUXILIARY DIKE FLOODWALL  
PROJECT IMPLEMENTATION PLAN /PROJECT QUALITY CONTROL PLAN  
(PIP/PQCP)  
TASK ORDER No. 10/ PB PROJECT 27901L

Project Manager: Ali Wahidi 8/31/07  
Ali Wahidi, PE, SE Date

Principal-in-Charge: Baron W. Miya 8/31/07  
Baron W. Miya, PE Date

**PRADO AUXILIARY DIKE FLOODWALL  
PROJECT IMPLEMENTATION PLAN /PROJECT QUALITY CONTROL PLAN  
(PIP/PQCP)**

**I. Project background**

The Prado Auxiliary Dike Floodwall is intended as a flood control project as part of the Prado Dam managed by the US Army Corps of Engineers. The project is located within a 20 feet wide parcel adjacent and contiguous to the BNSF railroad property immediately east of Auto Center Drive in the City of Corona. It is approximately 1000 feet long, and will be designed to withstand flood levels at the top elevation of 594 feet.

**II. Project deliverables**

The focus of the floodwall design will involve preparing bid documents including plans, specifications, and cost estimates.

Plans

The plans shall be have the following elements:

- Survey Prepared on Microstation 3-D DGN format;
- information showing separate northing and easting, north arrow, graphic scales and topographic information;
- Cross section at 100 feet intervals to show any utilities, existing buildings, and BNSF features;
- Stamped by CA structural engineer

Specifications

The specs shall be prepared using the Specs-Intact program

QA/QC Plan

- Org chart
- General description of responsibilities of key team members;
- Designation of independent technical reviewer
- Internal PB procedures

Construction schedule

- Gantt chart schedule with major construction activities

Construction cost estimate

- Descriptive statements of construction methods, material sources, equipment, access, haul distances, production rates, placement procedures, environmental restrictions, crew sizes, labor rates, job conditions, and other assumptions.
- Quantity take offs
- Cost estimate to contain tabulated spreadsheets, narrative of project scope

and schedule, supporting documentation, working drawings, production calculations, and CD ROM

- Comply with various Corps cost estimating regulations;

### **III. Project organization and staffing**

The analysis of the floodwall and the preparation of the Design Documentation Report will be performed by various PB staff from various offices.

Principal Manager - Baron Miya, PE  
Project Manager – Ali Wahidi, PE, SE  
Lead Civil Engineer – Shavaz Yousefian, PE  
Lead Drainage Engineer – Mark Komoto  
Lead QA/QC – Tom Lee, PE, GE

### **V. Project schedule**

The project schedule has been established to meet the Corps' milestone date to construct both the auxiliary dike and the floodwall by Spring 2008. The floodwall design will be incorporated into the auxiliary dike construction.

- NTP issued – August 20, 2007
- Submit QA/QC Plan – Within 14 days of NTP (September 4, 2007)
- Final Design Review and Conference Meeting – 90 calendar days after NTP (November 20, 2007); 10 day review period
- Back Check Review – 10 calendar days after final review conference meeting (December 4, 2007)
- Submit the Engineering Considerations and Instructions for Field Personnel 30 days after final design review meeting (December 30, 2007)

### **V. Task order budget**

Task Order No. 10: \$228,709

### **VI. Project risk analysis**

Various design loadings considerations were checked in the prior phase of work preparing the Design Documentation Report. The worst case scenarios were checked to determine the maximum loadings on the floodwall.

The design package will have internal PB reviews, reviews by the Corps staff, and an independent technical review.

**VII. Project document and data control**

- USACE Task Order No. 10 (PB project 27901L)
- Files stored on Los Angeles file server: K:/Los Angeles/Prado Floodwall
- Invoicing documentation – Los Angeles

**VIII. Project Quality Assurance and Quality Control Procedures**

Project activities will be performed in accordance with PB's ISO 9000– certified quality system. Tom Lee, Senior Geotechnical Engineer will be the lead QA/QC reviewer.

**IX. Project meetings**

Expect to have monthly coordination meetings with the Corps at the milestone dates.

**X. Project quality reviews**

Tom Lee is the QA/QC manager who will be reviewing the main deliverables. Abu Israil, PE of Bengal Engineering is the independent technical reviewer.

**XI. Contract items**

OH rate: 157.5%  
Profit: 10.5%  
Payment: Lump sum

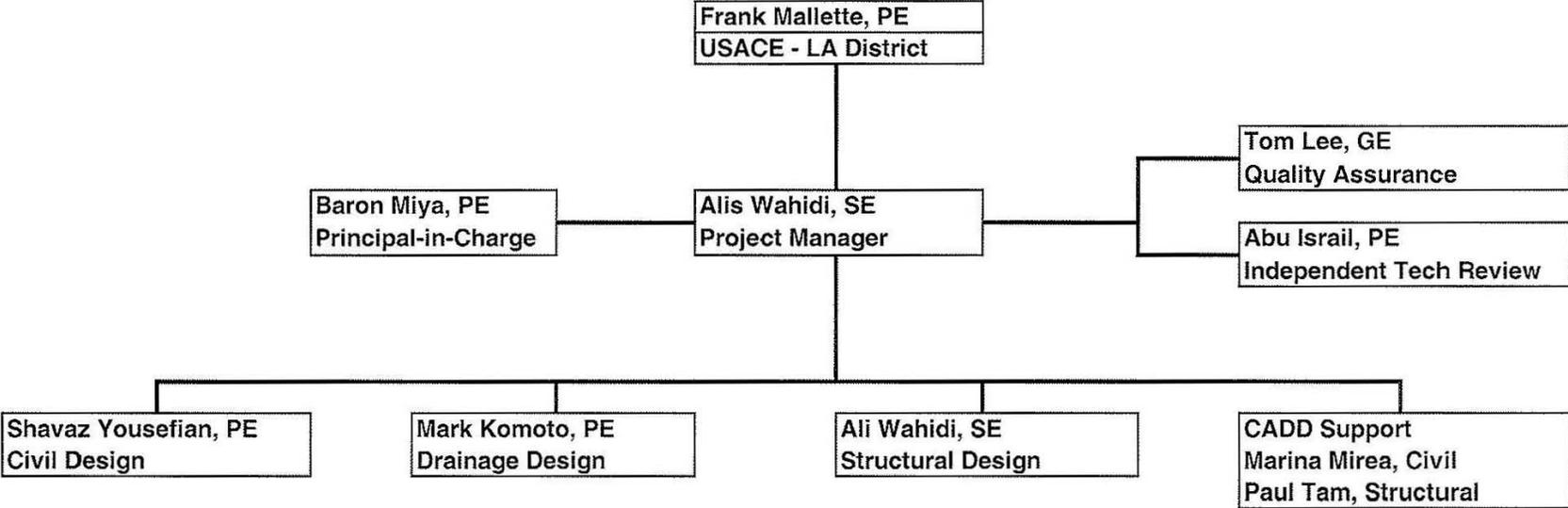
Small business component:

Bengal Engineering – Disadvantaged Small Business and Section 8a sub

Subtasks

<u>No.</u>	<u>Description</u>
1	Design
2	Bengal Engineering
3	Other Direct Costs

PRADO AUXILIARY DIKE FINAL DESIGN



## **APPENDIX B**

### **ALCOA DIKE**

#### **B-1. FEATURE DESCRIPTION**

The old Alcoa Aluminum Plant area is located just outside of the existing Prado Basin rights-of-way in the southeastern part of the reservoir and is located within the proposed reservoir taking line at elevation 566. Studies indicated it would be more economical to construct a dike around the aluminum plant and other properties than to acquire them. The recommended dike would be adjacent to the existing Smith Avenue and Rincon Street. The alignment of the dike was selected to minimize impacts on existing facilities such as streets, utilities, sludge drying beds, and other industrial and commercial development. The dike would be 7,550 feet in length, and its top would vary in elevation between 566.0 and 569.8 in accordance with the freeboard design. This design would provide 190-year level of protection. The dike would have a top width of 15 feet, and a maximum height of 30 feet above the existing ground surface with an average height of approximately 20 feet. The reservoir side of the slopes would be protected with 18 inches of stone over a layer of filter cloth. Road crossings at Butterfield Drive, Rincon Street, and Auburndale Street would be modified.

#### **B-2. WORK PRODUCTS TO BE REVIEWED**

a. Project Features. In 2006, the Local Sponsor published a DDR for the Alcoa Dike feature, prepared for them by DMJM Harris & Associates, which proposed some revisions to the alignment shown in the 1988 Phase 2 GDM. SPL approved the document and initiated the design process to begin work on the Plans and Specifications for the Alcoa Dike in 2008. Based on further coordination with the Sponsor and the City of Corona, additional revisions are proposed and subsequently will be documented in a revised DDR. In addition, per the Local Sponsor's request, SPL will award a contract to an A/E Contractor to prepare Plans and Specifications for the design of the utility and road relocations.

b. Products for Review. District Quality Control activities for the Alcoa Dike features have been on-going. Being that the design is in the final stages, this Review Plan proposes that only one additional review is required for the design products utilizing both the ATR and the IEPR. All three review teams will review the following:

- Alcoa Dike Design Documentation Report
- Alcoa Dike Plans & Specifications (Utility/Road Relocations)
- Alcoa Dike Plans & Specifications

c. Reference Materials. An electronic version of the following documents will be provided:

- Phase II General Design Memorandum, dated August 1988
- Design Memorandum No.17, Prado Dam Feature Design Alternate Interior Dike at Alcoa Aluminum Plant, dated September 2006 (Prepared by DMJM)

- Previous Design Review Documentation

### **B-3. SCOPE OF REVIEW**

a. District Quality Control. District Quality Control activities for the Alcoa Dike plans and specifications will consist of quality checks and reviews, supervisory reviews, Project Delivery Team (PDT) reviews, Local Sponsor review, and a BCOE Review as required by the ER 1110-1-12.

b. Agency Technical Review. Agency Technical Review (ATR) will examine the Alcoa Dike plans and specifications, focusing on compliance with established policy, principles and procedures using clearly justified and valid assumptions. It includes the verification of assumptions, methods, procedures, and material used in analyses based on the level of complexity of the analysis. The ATR should verify the alternatives evaluated, appropriateness of data used and level of data obtained, functionality of the project and verify the reasonableness of the results including whether the project meets the customer's needs consistent with law and existing policy and engineering and scientific principles. The ATR should also determine if the proposed alternative is feasible and will be safe, functional, constructible, and environmentally sustainable within the Federal interest, and whether the concepts and project costs are valid. The final review will confirm whether all relevant engineering and scientific disciplines have been effectively integrated and that the content is sufficiently complete for the current phase of the project. The ATR team should also ensure that the Alcoa Dike embankment design satisfies all of the concerns on the design and construction of the Corona Housing Dike and the Corona Treatment Dikes at Prado Dam that were raised at the January 2010 Dam Safety Senior Oversight Group review of SPRA projects.

c. Independent External Peer Review (Safety Assurance Review). The Alcoa Dike shall undergo an IEPR for the Design and Construction Phases. During the Design Phase, key features and components to be evaluated/reviewed are the embankment & appurtenances, utility relocations, RCB structural integrity, and road reconstruction. The panel will validate the state of the art approach being used to design and construct the system. In addition, the panel should focus on any unique features and changes from the assumptions made and conditions that were presented in the authorized Phase II GDM. During the construction phase, the panel should verify assumptions made during the design are still valid through construction; and for the O&M manual, whether the requirements specified maintain the conditions anticipated for the project to function properly in the future.

During the Construction Phase, a site visit shall be scheduled for the reviewers to evaluate/review construction activities. The panel's visit to the construction site will be a 2-day trip to include the appropriate peer reviewers for the progress of construction to review critical construction operations.

The visit should coincide with the midpoint of construction and shall terminate with an exit briefing, which will be scheduled by the Project Manager and will be conducted at the Prado Resident Office.

Each site visit shall be documented with a Field Visit Report. The Field Visit reports will include a check list, photographs and text summarizing observations and information noted during each site visit. The Field Visit Reports shall be included in the Construction Final Report as an appendix.

## B-4. REVIEW SCHEDULE

a. ATR Schedule. The ATR process for the Alcoa Dike will follow the following timeline. Actual dates may have to be adjusted once the period draws closer.

Review Plan Approved by RMO (SPD)	7May10
Submittal of Final DDR	31Jan12
District Quality Control Review of DDR	1Feb12 – 28Feb12
ATR Review	1Feb12 – 28Feb12
ATR Complete Back Checking	3Apr12 – 16Apr12
ATR Certification	17Apr12
A/E Submittal of Draft P&S Package (Utilities/Roads)	31Jan12
District Quality Control	1Feb12 – 28Feb12
ATR Review	1Feb12 – 28Feb12
Submittal of Final P&S Package (Dike/Utilities/Roads)	31Jan12
District Quality Control	1Feb12 – 28Feb12
ATR & BCOE Review	1Feb12 – 28Feb12
ATR Complete Back Checking	3Apr12 – 16Apr12
ATR Certification	17Apr12
BCOE Certification Complete	17Apr12
Advertise Construction Contract	25Oct12
Open Bids	5Dec12
Construction Contract Award	4Jan13

b. ATR Funding. The current cost estimate for the review of the Alcoa Dike design materials is in the range of \$ 60,000 to \$85,000.

c. IEPR Schedule. The IEPR process will follow the following timeline. Actual dates may have to be adjusted once the period draws closer.

Submittal of Final DDR	31Jan12
Type II IEPR Review	14Mar12 – 31Mar12
Type II IEPR Complete Back Checking	18Apr12 – 22Apr12
SPD Approval of SAR Responses	12May12
Submittal of Final P&S Package	31Jan12
Type II IEPR Review	14Mar12 – 31Mar12
Type II IEPR Complete Back Checking	18Apr12 – 22Apr12
SPD Approval of SAR Responses	12May12
Construction Contract Award	4Jan13
Midpoint Construction	9Sep13
Construction Completion	6Jun14
IEPR Final Reports	Jun14

d. IEPR Funding . The RMC will identify someone independent from the PDT to scope the IEPR and develop an Independent Government Estimate. The Los Angeles District will provide funding to the IEPR panel and the RMC.

## **B-5. REVIEW TEAM**

a. District Quality Control. Reference is made to the SARM QMP that identifies the activities, roles and responsibilities for the DQC of the Alcoa Dike.

b. Agency Technical Review Team Qualifications. The ATR team for the Alcoa Dike should be comprised of the following disciplines:

Hydrology and Hydraulics. The team member should be a registered professional with 10 or more years experience in conducting and evaluating hydrologic and hydraulic analyses for flood risk management projects. Experience with all aspects of hydraulic engineering including: hydraulic analyses and designs for spillways, outlets, stilling basins, approach channels, and diversion structures; water velocities, pressures, directions, trajectories, and erosion potential; and hydraulic modeling is desired. Experience with the Dam or Levee Safety program is also desired. Active participation in related professional societies is encouraged.

Geotechnical Engineering. The team member should have 20 or more years experience in geotechnical engineering in high seismicity regions. Team member must demonstrate significant experience in the geotechnical aspects of analysis, design and construction of flood risk management structures including earthen dams, floodwalls, and closure structures. Specific required earthen dam design experience includes assessing soil properties, static and dynamic slope stability, seepage analysis, deformation analyses, filter design, slope protection design, preparation of plans/specifications and instructions to field personnel. Required earthen dam construction experience includes diversion and control of water, foundation treatment and improvement, borrow operations, compaction and moisture conditioning methods, evaluating QA/QC and record test data, and evaluating earthwork construction and differing site condition claims.

Structural Engineering. The team member should have 10 or more years experience in structural engineering. Experience needs to include design and evaluations of large complex hydraulic structures associated with flood risk management projects. Experience with AASHTO and state road and bridge standards as well as practical knowledge of construction methods and techniques as it relates to structural portions of projects is encouraged.

Civil Engineering. The team member should have 10 or more years experience with large scale civil/site work projects to include levee systems, roads and highways, detours, relocations, paving and drainage.

NEPA Compliance. The team member should have 10 or more years experience in NEPA compliance activities and preparation of Environmental Assessments and Environmental Impact Statements for complex civil/site work projects. Experience is needed for levee system projects.

ATR Team Leader. The ATR Team Leader should have 10 or more years experience with Civil Works Projects and have performed ATR Team Leader duties on complex civil works projects.

c. IEPR Panel Qualifications. The IEPR panel should be comprised of members with the following expertise:

Hydrology and Hydraulics (H&H) Panel Member. The H&H Panel Member should be a registered professional from academia, a public agency, or an Architect-Engineer or consulting firm with 15 or more years experience in conducting and evaluating hydrologic and hydraulic analyses for flood risk management projects. The Panel Member should be experienced in Flood Damage Reduction Projects, including large earth-fill, rock-fill, concrete or combination dams or systems of dams with their many hydraulic appurtenances such as gated and un-gated spillways, stilling basins, outlet works, control gates and valves, power intake structures, tunnels, conduits and approach and diversion channels and appurtenant control structures; and/or Local Flood Damage Reduction Projects including levees; floodwalls; gravity outlet and gate closure structures; pumping stations; detention basins; storm drainage structures; lined and unlined flood control channels and improvement structures. Active participation in related professional societies is encouraged.

Geotechnical Engineering Panel Member. The Geotechnical Engineering Panel Member should be a registered professional from academia, a public agency, or an Architect-Engineer or consulting firm with 20 years or more experience in geotechnical and earthquake engineering for critical flood risk management infrastructure and dam safety evaluations. The panel member should be a recognized expert in the geotechnical analysis and design of earthen dams and floodwalls, have experience in preparation of contract specifications, and demonstrate significant experience in the construction and safety evaluation of earthen dams.

Structural Engineering Panel Member. Structural Engineer should be a registered professional from academia, a public agency, or an Architect-Engineer or consulting firm with extensive experience in design of hydraulic structures for large and complex civil works projects including floodwalls and drainage features, etc.. Designs may involve unusual stresses because of size and shape, loading conditions resulting from unbalanced earth pressures, settlement and creeping of earth fills.

Civil Engineering Panel Member. The Civil Engineer should be a registered professional from academia, a public agency, or an Architect-Engineer or consulting firm with extensive experience in design of major flood control structures including earthen dams, levees, guide dikes and channels. Experience utilizing riprap protection, soil cement or concrete in design of levees, guide dikes and channels for large civil works projects is required. Practical knowledge of construction methods and techniques as it relates to these types of projects including earthwork, erosion control, hydraulic structures, interior drainage, site grading, roadwork, and concrete work is encouraged.

d. Review Team Roster. The Review Team Roster for the Alcoa Dike will include the following representatives:

Discipline/Role	Name	Agency/Office	Phone No.
SPL District PCT Leads include:			
Project Team Leader	Funke Ojuri	CESPL-ED-DB	(213) 452-3658
SPL Project Manager	Thomas Bucklew	CESPL-PM-I	(213) 280-9511
Structural Engineer	Nirav Patel	CESPL-ED-DS	(213) 452-3746
Geotechnical Engineer	Steve Chickey	CESPL-ED-GD	(213) 452-3590
Materials Engineer	Francis Omoregie	CESPL-ED-GI	(213) 452-3599
Geologist	Jeff Devine	CESPL-ED-GG	(213) 452-3579
Hydraulic Engineer	Robert Castle	CESPL-ED-HH	(213) 452-3557
Cost Engineer	Juan Dominguez	CESPL-ED-DS	(213) 452-3737
Landscape Architect	Susan Willis	CESPL-ED-DA	(213) 452-3638
Environmental	Hayley Lovan	CESPL-PD-RL	(213) 452-3863
Real Estate	Pete Garcia	CESPL-AM-	(213) 452-3131
Construction Engineer	Hugh Brown	CESPL-CO-GS	(951) 898-6142

ATR Team includes:

ATR Team Leader			
Civil Engineer			
Geotechnical Engineer			
Hydraulic Engineer			
Structural Engineer			
Environmental Specialist			

IEPR Panel includes:

Hydraulic Engineer			
Geotechnical Engineer			
Structural Engineer			
Civil Engineer			

\* \* \*

## APPENDIX C

### PRISON DIKE

#### C-1. FEATURE DESCRIPTION

The California Institute for Women is under the jurisdiction of the State of California and is located on a 12.5-acre site adjacent to U.S. Government land in the northern part of Prado Dam reservoir. Approximately 75 percent of the site is below the proposed taking line at elevation 566; acquisition and relocation of the existing facility would be economically and socially infeasible. The recommended plan includes construction of a dike on mostly existing reservoir land along the western and southern border of the facility. The dike on the west side of the institution would be approximately 2,860 feet in length, and the top of the dike elevation would range between 566 and 568.6. The dike along the southern part of the facility would be 2,910 feet in length of which 1,130 feet would be located on privately owned land to be acquired. The elevations on top of dike would vary from 566.0 to 570.7, depending on the exposure to the reservoir and computed wave height. This design would provide protection against floods having a frequency of up to 190 years. Both dikes would have a top width of 15 feet and side slopes of 1V on 2.25H. The reservoir side of the slope would be protected by an 18-inch-thick riprap over a layer of filter cloth.

#### C-2. WORK PRODUCTS TO BE REVIEWED

a. Project Features. Design for the South Reach of the Prison Dike was initiated in 2009 presuming no major coordination issues for this reach. The North Reach is impacted by the State's plan to expand its facility to include a mental health facility on the vacant area at the north-east corner of their property. SPL and the Local Sponsor are coordinating with the State to ensure the new projects will provide adequate tie into the design protection elevation. It is anticipated that the design of the North Reach will commence in the Fall of 2010 after further coordination and refinement of the State's plan.

b. Products for Review. District Quality Control activities for the Prison Dike features have been on-going. Revisions to the Prison dike alignment and changes to accommodate the State's facility will be documented in a DDR. The draft DDR will include all revisions for the South Reach and the final DDR will include all revisions for the North Reach. This Review Plan proposes the DQC, ATR and IEPR reviews will be conducted on the following draft and final design products:

- Prison Dike Design Documentation Report
- Prison Dike Plans & Specifications

c. Reference Materials. An electronic version of the following documents will be provided:

- Phase II General Design Memorandum, dated August 1988

### **C-3. SCOPE OF REVIEW**

a. District Quality Control. District Quality Control activities for the Prison Dike plans and specifications will consist of quality checks and reviews, supervisory reviews, Project Delivery Team (PDT) reviews, Local Sponsor review, and a BCOE Review as required by the ER 1110-1-12.

b. Agency Technical Review. Agency Technical Review (ATR) will examine the Prison Dike plans and specifications, focusing on compliance with established policy, principles and procedures using clearly justified and valid assumptions. It includes the verification of assumptions, methods, procedures, and material used in analyses based on the level of complexity of the analysis. The ATR should verify the alternatives evaluated, appropriateness of data used and level of data obtained, functionality of the project and verify the reasonableness of the results including whether the project meets the customer's needs consistent with law and existing policy and engineering and scientific principles. The ATR should also determine if the proposed alternative is feasible and will be safe, functional, constructible, and environmentally sustainable within the Federal interest, and whether the concepts and project costs are valid. The final review will confirm whether all relevant engineering and scientific disciplines have been effectively integrated and that the content is sufficiently complete for the current phase of the project. The ATR team should also ensure that the Prison Dike design satisfies all of the concerns on the design and construction of the Corona Housing Dike and the Corona Treatment Dikes at Prado Dam that were raised at the January 2010 Dam Safety Senior Oversight Group review of SPRA projects.

c. Independent External Peer Review (Safety Assurance Review). The Prison Dike shall undergo an IEPR for the Design and Construction Phases. During the Design Phase, key features and components to be evaluated/reviewed are the embankment & appurtenances, and structural integrity of the drainage features. The panel will validate the state of the art approach being used to design and construct the system. In addition, the panel should focus on any unique features and changes from the assumptions made and conditions that were presented in the authorized Phase II GDM. During the construction phase, the panel should verify assumptions made during the design are still valid through construction; and for the O&M manual, whether the requirements specified maintain the conditions anticipated for the project to function properly in the future.

During the Construction Phase two site visits shall be scheduled for the reviewers to evaluate/review construction activities. The panel's visit to the construction site will be a 2-day trip to include the appropriate peer reviewers for the progress of construction to review critical construction operations. The visits should coincide with the mid point of construction for both the South and North reaches and shall terminate with an exit briefing, which will be scheduled by the Project Manager and will be conducted at the Prado Resident Office. Each site visit shall be documented with a Field Visit Report. The Field Visit reports will include a check list, photographs and text summarizing observations and information noted during each site visit. The Field Visit Reports shall be included in the Construction Final Report as an appendix.

## C-4. REVIEW SCHEDULE

a. ATR Schedule. The ATR process for the Prison Dike will follow the following timeline. Actual dates may have to be adjusted once the period draws closer.

### Prison Dike

Review Plan Approved by RMO (SPD)	7May10
District Quality Control Review of DDR	21Dec11 – 20Jan12
Submittal of Final DDR	5Mar12
ATR Review	6Mar12 – 2Apr12
ATR Complete Back Checking	18Jun12 – 9Jul12
ATR Certification	1Aug12
District Quality Control	21Dec11 – 20Jan12
ATR & BCOE Review	6Mar12 – 2Apr12
ATR Complete Back Checking	18Jun12 – 9Jul12
ATR Certification	1Aug12
BCOE Certification Complete	1Aug12
Advertise Construction Contract	19Sep12
Open Bids	24Oct12
Construction Contract Award	28Nov12

b. ATR Funding. The current cost estimate for the review of the Prison Dike design materials is in the range of \$ 110,000 to \$145,000.

c. IEPR Schedule. The IEPR process will follow the following timeline. Actual dates may have to be adjusted once the period draws closer.

### Prison Dike

Submittal of Final DDR	23Apr12
Type II IEPR Review	24Apr12 – 23May12
Type II IEPR Complete Back Checking	8Aug10 – 16Aug10
SPD Approval of SAR Responses	16Aug10
Submittal of Final P&S Package	23Apr12
Type II IEPR Review	24Apr12 – 23Apr12
Type II IEPR Complete Back Checking	8Aug12 – 16Aug12
SPD Approval of SAR Responses	18Sep12
Construction Contract Award	28Nov12
Midpoint Construction	15May13
Construction Completion	13Nov13

d. IEPR Funding. The RMC will identify someone independent from the PDT to scope the IEPR and develop an Independent Government Estimate. The Los Angeles District will provide funding to the IEPR panel and the RMC.

## **C-5. REVIEW TEAM**

a. District Quality Control. Reference is made to the SARM QMP that identifies the activities, roles and responsibilities for the DQC of the Prison Dike.

b. Agency Technical Review Team Qualifications. The ATR team for the Prison Dike should be comprised of the following disciplines:

Hydrology and Hydraulics. The team member should be a registered professional with 10 or more years experience in conducting and evaluating hydrologic and hydraulic analyses for flood risk management projects. Experience with all aspects of hydraulic engineering including: hydraulic analyses and designs for spillways, outlets, stilling basins, approach channels, and diversion structures; water velocities, pressures, directions, trajectories, and erosion potential; and hydraulic modeling is desired. Experience with the Dam or Levee Safety program is also desired. Active participation in related professional societies is encouraged.

Geotechnical Engineering. The team member should have 20 or more years experience in geotechnical engineering in high seismicity regions. Team member must demonstrate significant experience in the geotechnical aspects of analysis, design and construction of flood risk management structures including earthen dams, floodwalls, and closure structures. Specific required earthen dam design experience includes assessing soil properties, static and dynamic slope stability, seepage analysis, deformation analyses, filter design, slope protection design, preparation of plans/specifications and instructions to field personnel. Required earthen dam construction experience includes diversion and control of water, foundation treatment and improvement, borrow operations, compaction and moisture conditioning methods, evaluating QA/QC and record test data, and evaluating earthwork construction and differing site condition claims.

Structural Engineering. The team member should have 10 or more years experience in structural engineering. Experience needs to include design and evaluations of large complex hydraulic structures associated with flood risk management projects. Experience with AASHTO and state road and bridge standards as well as practical knowledge of construction methods and techniques as it relates to structural portions of projects is encouraged.

Civil Engineering. The team member should have 10 or more years experience with large scale civil/site work projects to include levee systems, roads and highways, relocations, paving and drainage.

NEPA Compliance. The team member should have 10 or more years experience in NEPA compliance activities and preparation of Environmental Assessments and Environmental Impact Statements for complex civil/site work projects. Experience is needed for levee system projects.

ATR Team Leader. The ATR Team Leader should have 10 or more years experience with Civil Works Projects and have performed ATR Team Leader duties on complex civil works projects.

c. IEPR Panel Qualifications. The IEPR panel should be comprised of members with the following expertise:

Hydrology and Hydraulics (H&H) Panel Member. The H&H Panel Member should be a registered professional from academia, a public agency, or an Architect-Engineer or consulting firm with 15 or more years experience in conducting and evaluating hydrologic and hydraulic analyses for flood risk management projects. The Panel Member should be experienced in Flood Damage Reduction Projects, including large earth-fill, rock-fill, concrete or combination dams or systems of dams with their many hydraulic appurtenances such as gated and un-gated spillways, stilling basins, outlet works, control gates and valves, power intake structures, tunnels, conduits and approach and diversion channels and appurtenant control structures; and/or Local Flood Damage Reduction Projects including levees; floodwalls; gravity outlet and gate closure structures; pumping stations; detention basins; storm drainage structures; lined and unlined flood control channels and improvement structures. Active participation in related professional societies is encouraged.

Geotechnical Engineering Panel Member. The Geotechnical Engineering Panel Member should be a registered professional from academia, a public agency, or an Architect-Engineer or consulting firm with 20 years or more experience in geotechnical and earthquake engineering for critical flood risk management infrastructure and dam safety evaluations. The panel member should be a recognized expert in the geotechnical analysis and design of earthen dams and floodwalls, have experience in preparation of contract specifications, and demonstrate significant experience in the construction and safety evaluation of earthen dams.

Structural Engineering Panel Member. Structural Engineer should be a registered professional from academia, a public agency, or an Architect-Engineer or consulting firm with extensive experience in design of hydraulic structures for large and complex civil works projects including floodwalls and drainage features, etc.. Designs may involve unusual stresses because of size and shape, loading conditions resulting from unbalanced earth pressures, settlement and creeping of earth fills.

Civil Engineering Panel Member. The Civil Engineer should be a registered professional from academia, a public agency, or an Architect-Engineer or consulting firm with extensive experience in design of major flood control structures including earthen dams, levees, guide dikes and channels. Experience utilizing riprap protection, soil cement or concrete in design of levees, guide dikes and channels for large civil works projects is required. Practical knowledge of construction methods and techniques as it relates to these types of projects including earthwork, erosion control, hydraulic structures, interior drainage, site grading, roadwork, and concrete work is encouraged.

d. Review Team Roster. The Review Team Roster for the Prison Dike will include the following representatives:

Discipline/Role	Name	Agency/Office	Phone No.
SPL District Leads include:			
Project Team Leader	Huma Nisar	CESPL-ED-DB	(213) 452-3665
SPL Project Manager	Thomas Bucklew	CESPL-PM-I	(213) 280-9511
Structural Engineer	Nirav Patel	CESPL-ED-DS	(213) 452-3746
Geotechnical Engineer	Steve Chickey	CESPL-ED-GD	(213) 452-3590
Materials Engineer	Francis Omoregie	CESPL-ED-GI	(213) 452-3599
Geologist	Jeff Devine	CESPL-ED-GG	(213) 452-3579
Hydraulic Engineer	Kerry Casey	CESPL-ED-HH	(213) 452-3557
Cost Engineer	Juan Dominguez	CESPL-ED-DS	(213) 452-3737
Landscape Architect	Susan Willis	CESPL-ED-DA	(213) 452-3638
Environmental	Hayley Lovan	CESPL-PD-RL	(213) 452-3863
Real Estate	Pete Garcia	CESPL-AM-	(213) 452-3131
Construction Engineer	Hugh Brown	CESPL-CO-GS	(951) 898-6142

ATR Team includes:

ATR Team Leader			
Civil Engineer			
Geotechnical Engineer			
Hydraulic Engineer			
Structural Engineer			
Environmental Specialist			

IEPR Panel includes:

Hydraulic Engineer			
Geotechnical Engineer			
Structural Engineer			
Civil Engineer			

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## APPENDIX D

### YORBA SLAUGHTER ADOBE PROTECTION

#### D-1. FEATURE DESCRIPTION

A compacted earthen dike would extend around and protect the San Bernardino Museum property. The top width of the dike would be 15 feet at elevation 566.0 feet. The maximum height of the dike above the existing ground would be approximately 74 feet. The dike embankment would have side slopes of 1 vertical on 2.25 horizontal and would have slope revetment consisting of 24-inch stone over 9 inches of bedding material and 6 inches of filter on the reservoir side.

#### D-2. WORK PRODUCTS TO BE REVIEWED

a. Project Features. Design for the Yorba Slaughter Adobe Protection was initiated in 2009 with in-house staff.

b. Products for Review. District Quality Control activities for the Yorba Slaughter Adobe Protection have been on-going. Being that the design is in the final stages, this Review Plan proposes that only one additional review is required for the design product. The DQC, ATR and the IEPR will review the following:

- Yorba Slaughter Adobe Protection Design Documentation Report
- Yorba Slaughter Adobe Protection Plans & Specifications

c. Reference Materials. An electronic version of the following documents will be provided:

- Phase II General Design Memorandum, dated August 1988
- Floodproofing Alternatives for Yorba Slaughter Adobe, dated 1992
- Design Documentation Report – Supplemental Study, dated 2007

#### D-3. SCOPE OF REVIEW

a. District Quality Control. District Quality Control activities for the Yorba Slaughter Adobe Protection plans and specifications will consist of quality checks and reviews, supervisory reviews, Project Delivery Team (PDT) reviews, Local Sponsor review, and a BCOE Review as required by the ER 1110-1-12.

b. Agency Technical Review. Agency Technical Review (ATR) will examine the Yorba Slaughter Adobe Protection plans and specifications, focusing on compliance with established policy, principles and procedures using clearly justified and valid assumptions. It includes the verification of assumptions, methods, procedures, and material used in analyses based on the level of complexity of the analysis. The ATR should verify the alternatives evaluated, appropriateness of data used and level of data obtained, functionality of the project and verify the reasonableness of the results

including whether the project meets the customer’s needs consistent with law and existing policy and engineering and scientific principles. The ATR should also determine if the proposed alternative is feasible and will be safe, functional, constructible, and environmentally sustainable within the Federal interest, and whether the concepts and project costs are valid. The final review will confirm whether all relevant engineering and scientific disciplines have been effectively integrated and that the content is sufficiently complete for the current phase of the project. The ATR team should also ensure that the Yorba Slaughter Adobe Protection design satisfies all of the concerns on the design and construction of the Corona Housing Dike and the Corona Treatment Dikes at Prado Dam that were raised at the January 2010 Dam Safety Senior Oversight Group review of SPRA projects.

c. Independent External Peer Review (Safety Assurance Review). Most of the protection features the Santa Ana Mainstem Prado Dam projects are located in highly urbanized areas, and thus significant public safety concerns exist. However, the Yorba Slaughter Adobe Protection is isolated within the Prado Basin, affecting only properties owned by the County of San Bernardino, the County of Orange, and the Federal government. This proposed protection feature at the Yorba Slaughter Adobe is designed to protect the historical San Bernardino museum grounds from the Reservoir Design Flood. The site is not adjacent to any residential areas and the only public access is by a road that dead-ends just beyond the museum area. During a flood event, low points at either end of the road are much lower than the proposed protection features and are flooded at much lower flood events, preventing all public access to the road. For these reasons, a Safety Assurance Review is not required for this proposed protection feature at the Yorba Slaughter Adobe.

**D-4. REVIEW SCHEDULE**

a. ATR Schedule. The ATR process for the Yorba Slaughter Adobe Protection will follow the following timeline. Actual dates may have to be adjusted once the period draws closer.

Review Plan Approved by RMO (SPD)	7May10
District Quality Control& BCOE Review	21Oct11 – 4Nov11
ATR Review	30Nov11 – 3Jan12
ATR Complete Back Checking	23Jan12 – 27Jan12
ATR Certification	30Jan12
BCOE Certification Complete	30Jan12
Advertise Construction Contract	6Feb12
Construction Contract Award	9Apr12

b. ATR Funding. The current cost estimate for the review of the Yorba Slaughter Adobe Protection design materials is in the range of \$50,000 to \$65,000.

**D-5. REVIEW TEAM**

a. District Quality Control. Reference is made to the SARM QMP that identifies the activities, roles and responsibilities for the DQC of the Yorba Slaughter Adobe Protection.

b. Agency Technical Review Team Qualifications. The ATR team for the Yorba Slaughter Adobe Protection should be comprised of the following disciplines:

Hydrology and Hydraulics. The team member should be a registered professional with 10 or more years experience in conducting and evaluating hydrologic and hydraulic analyses for flood risk management projects. Experience with all aspects of hydraulic engineering including: hydraulic analyses and designs for spillways, outlets, stilling basins, approach channels, and diversion structures; water velocities, pressures, directions, trajectories, and erosion potential; and hydraulic modeling is desired. Experience with the Dam or Levee Safety program is also desired. Active participation in related professional societies is encouraged.

Geotechnical Engineering. The team member should have 20 or more years experience in geotechnical engineering in high seismicity regions. Team member must demonstrate significant experience in the geotechnical aspects of analysis, design and construction of flood risk management structures including earthen dams, floodwalls, and closure structures. Specific required earthen dam design experience includes assessing soil properties, static and dynamic slope stability, seepage analysis, deformation analyses, filter design, slope protection design, preparation of plans/specifications and instructions to field personnel. Required earthen dam construction experience includes diversion and control of water, foundation treatment and improvement, borrow operations, compaction and moisture conditioning methods, evaluating QA/QC and record test data, and evaluating earthwork construction and differing site condition claims.

Structural Engineering. The team member should have 10 or more years experience in structural engineering. Experience needs to include design and evaluations of large complex hydraulic structures associated with flood risk management projects. Experience with AASHTO and state road and bridge standards as well as practical knowledge of construction methods and techniques as it relates to structural portions of projects is encouraged.

Civil Engineering. The team member should have 10 or more years experience with large scale civil/site work projects to include levee systems, roads and highways, relocations, paving and drainage.

NEPA Compliance. The team member should have 10 or more years experience in NEPA compliance activities and preparation of Environmental Assessments and Environmental Impact Statements for complex civil/site work projects. Experience is needed for levee system projects.

ATR Team Leader. The ATR Team Leader should have 10 or more years experience with Civil Works Projects and have performed ATR Team Leader duties on complex civil works projects.

c. Review Team Roster. The Review Team Roster for the Yorba Slaughter Adobe Protection will include the following representatives:

Discipline/Role	Name	Agency/Office	Phone No.
SPL District Leads include:			
Project Team Leader	Santiago Munoz	CESPL-ED-DB	(213) 452-3668
SPL Project Manager	Thomas Bucklew	CESPL-PM-I	(213) 280-9511
Civil Engineer	Jose Rocha	CESPL-ED-DB	(213) 452-3661
Structural Engineer	Tony Wong	CESPL-ED-DS	(213) 452-3700
Geotechnical Engineer	Steve Chickey	CESPL-ED-GD	(213) 452-3590
Materials Engineer	Francis Omoregie	CESPL-ED-GI	(213) 452-3599
Hydraulic Engineer	Robert Castle	CESPL-ED-HH	(213) 452-3557
Cost Engineer	Rafiqul Talukder	CESPL-ED-DS	(213) 452-3745
Landscape Architect	Susan Willis	CESPL-ED-DA	(213) 452-3638
Environmental	Hayley Lovan	CESPL-PD-RL	(213) 452-3863
Real Estate	Pete Garcia	CESPL-AM-	(213) 452-3131
Construction Engineer	Hugh Brown	CESPL-CO-GS	(951) 898-6142

ATR Team includes:

ATR Team Leader			
Civil Engineer			
Geotechnical Engineer			
Hydraulic Engineer			
Structural Engineer			
Environmental Specialist			

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## APPENDIX E

### RIVER ROAD DIKE AND FLOODWALL

#### E-1. FEATURE DESCRIPTION

Orange County Flood Control District, concerned with the increases in land costs, prepared two Value Engineering (VE) Studies to identify areas within the Prado Basin that could be protected by a flood control structure in lieu of real estate acquisition. These areas were along the easterly side of the reservoir near River Road.

The VE Study prepared in July 1995 proposed construction of an earthen dike 4,500 feet in length which would eliminate the need for acquisition of 67 acres. This dike would be as much as 14 feet high in locations and constructed near the River Road corridor. Since completion of the VE study, development has occurred within a majority of the 67 acres which has raised the ground elevation above the 566-ft level. A reevaluation of the need for, or modification to this proposed dike is on-going.

The VE Study prepared in 1998 proposed construction of a floodwall to elevation 566 feet along River Road is proposed in lieu of real estate acquisition and will protect the affected properties from the 190-year Reservoir Design Flood (RDF). The 6-ft high wall would be located along the southwesterly side of River Road within the City of Norco, County of Riverside, California, between Bluff Street and Trail Street. While no permanent structures are below elevation 566-ft, the flood wall is to prevent reservoir water from flooding back yard properties below elevation 566-ft.

#### E-2. WORK PRODUCTS TO BE REVIEWED

a. Project Features. The design effort for the River Road Floodwall began in early 2010 with in-house staff. The Local Sponsor has awarded a contract to an A/E Contractor to re-evaluate the original Value Engineering Study which identified the requirements for River Road Dike. This re-evaluation is required to address real estate changes that have occurred since the completion of the original Value Engineering Study. Once the revised requirements have been identified and approved, SPL will initiate the work on the Plans and Specifications for the River Road Dike with in-house staff.

b. Products for Review. The Local Sponsor is reevaluating the Value Engineering proposals for the River Road Dike and the River Road Floodwall. Once completed, SPL will commence with the DDR and plans and specifications. This Review Plan proposes the DQC, ATR and IEPR reviews will be conducted on the following draft and final design products:

- River Road Floodwall Design Documentation Report
- River Road Dike & Floodwall Plans & Specifications

For the features constructed within the River Road right-of-ways, an agreement will be made with

the City of Norco for the operation and maintenance of these features. The DQC and IEPR will review the River Road Dike & Floodwall Operation & Maintenance (O&M) Manual.

c. Reference Materials. An electronic version of the following documents will be provided:

- Phase II General Design Memorandum, dated August 1988
- Value Engineering Study – River Road Flood Wall Bluff Street to Trail Street, dated Nov 1998

### **E-3. SCOPE OF REVIEW**

a. District Quality Control. District Quality Control activities for the River Road Dike and Floodwall plans and specifications will consist of quality checks and reviews, supervisory reviews, Project Delivery Team (PDT) reviews, Local Sponsor review, and a BCOE Review as required by the ER 1110-1-12.

a. Agency Technical Review. Agency Technical Review (ATR) will examine the River Road Dike and Floodwall plans and specifications, focusing on compliance with established policy, principles and procedures using clearly justified and valid assumptions. It includes the verification of assumptions, methods, procedures, and material used in analyses based on the level of complexity of the analysis. The ATR should verify the alternatives evaluated, appropriateness of data used and level of data obtained, functionality of the project and verify the reasonableness of the results including whether the project meets the customer's needs consistent with law and existing policy and engineering and scientific principles. The ATR should also determine if the proposed alternative is feasible and will be safe, functional, constructible, and environmentally sustainable within the Federal interest, and whether the concepts and project costs are valid. The final review will confirm whether all relevant engineering and scientific disciplines have been effectively integrated and that the content is sufficiently complete for the current phase of the project. The ATR team should also ensure that the River Road Dike embankment design satisfies all of the concerns on the design and construction of the Corona Housing Dike and the Corona Treatment Dikes at Prado Dam that were raised at the January 2010 Dam Safety Senior Oversight Group review of SPRA projects.

b. Independent External Peer Review (Safety Assurance Review) The River Road Dike and Floodwall shall undergo an IEPR for the Design and Construction Phases. During the Design Phase, key features and components to be evaluated/reviewed are the embankment, & appurtenances, and structural integrity of the floodwall design. The panel will validate the state of the art approach being used to design and construct the system. In addition, the panel should focus on any unique features and changes from the assumptions made and conditions that were presented in the authorized Phase II GDM. During the construction phase, the panel should verify assumptions made during the design are still valid through construction; and for the O&M manual, whether the requirements specified maintain the conditions anticipated for the project to function properly in the future.

During the Construction Phase, a site visit shall be scheduled for the reviewers to evaluate/review construction activities. The panel's visit to the construction site will be a 2-day trip to include the

appropriate peer reviewers for the progress of construction to review critical construction operations. The visit should coincide with the midpoint of construction and shall terminate with an exit briefing, which will be scheduled by the Project Manager and will be conducted at the Prado Resident Office. Each site visit shall be documented with a Field Visit Report. The Field Visit reports will include a check list, photographs and text summarizing observations and information noted during each site visit. The Field Visit Reports shall be included in the Construction Final Report as an appendix.

#### E-4. REVIEW SCHEDULE

a. ATR Schedule. The ATR process for the River Road Dike and Floodwall will follow the following timeline. Actual dates may have to be adjusted once the period draws closer.

Review Plan Approved by RMO (SPD)	7 May10
Submittal of Final DDR	6Jul12
District Quality Control Review of DDR	6Jul12 – 26Jul12
ATR Review	10Aug12 – 11Sep12
ATR Complete Back Checking	25Oct12 – 7Nov12
ATR Certification	30Nov12
Submittal of Final P&S Package	6Jul12
District Quality Control	6Jul12 – 26Jul12
ATR & BCOE Review	10Aug12 – 11Sep12
ATR Complete Back Checking	25Oct12 – 7Nov12
ATR Certification	30Nov12
BCOE Certification Complete	30Nov12
Advertise Construction Contract	10Dec12
Open Bids	10Jan13
Construction Contract Award	7Feb13

b. ATR Funding. The current cost estimate for the review of the River Road Dike and Floodwall design materials is in the range of \$120,000 to \$150,000.

c. IEPR Schedule. The IEPR process will follow the following timeline. Actual dates may have to be adjusted once the period draws closer.

Submittal of Final DDR	6Jul12
Type II IEPR Review	10Aug12 – 11Sep12
Type II IEPR Complete Back Checking	25Oct12 – 7Nov12
SPD Approval of SAR Responses	30Nov12
Submittal of Final P&S Package	6Jul12
Type II IEPR Review	10Aug12 – 11Sep12
Type II IEPR Complete Back Checking	25Oct12 – 7Nov12
SPD Approval of SAR Responses	30Nov12
Construction Contract Award	7Feb13
Midpoint Construction	Jul13
Construction Completion	Dec13
IEPR Final Reports	Jan14

d. IEPR Funding . The RMC will identify someone independent from the PDT to scope the IEPR and develop an Independent Government Estimate. The Los Angeles District will provide funding to the IEPR panel and the RMC.

## **E-5. REVIEW TEAM**

a. District Quality Control. Reference is made to the SARM QMP that identifies the activities, roles and responsibilities for the DQC of the River Road Dike and Floodwall.

b. Agency Technical Review Team Qualifications. The ATR team for the River Road Dike and Floodwall should be comprised of the following disciplines:

Hydrology and Hydraulics. The team member should be a registered professional with 10 or more years experience in conducting and evaluating hydrologic and hydraulic analyses for flood risk management projects. Experience with all aspects of hydraulic engineering including: hydraulic analyses and designs for spillways, outlets, stilling basins, approach channels, and diversion structures; water velocities, pressures, directions, trajectories, and erosion potential; and hydraulic modeling is desired. Experience with the Dam or Levee Safety program is also desired. Active participation in related professional societies is encouraged.

Geotechnical Engineering. The team member should have 20 or more years experience in geotechnical engineering in high seismicity regions. Team member must demonstrate significant experience in the geotechnical aspects of analysis, design and construction of flood risk management structures including earthen dams, floodwalls, and closure structures. Specific required earthen dam design experience includes assessing soil properties, static and dynamic slope stability, seepage analysis, deformation analyses, filter design, slope protection design, preparation of plans/specifications and instructions to field personnel. Required earthen dam construction experience includes diversion and control of water, foundation treatment and improvement, borrow operations, compaction and moisture conditioning methods, evaluating QA/QC and record test data, and evaluating earthwork construction and differing site condition claims.

Structural Engineering. The team member should have 10 or more years experience in structural engineering. Experience needs to include design and evaluations of large complex hydraulic structures associated with flood risk management projects. Experience with AASHTO and state road and bridge standards as well as practical knowledge of construction methods and techniques as it relates to structural portions of projects is encouraged.

Civil Engineering. The team member should have 10 or more years experience with large scale civil/site work projects to include levee systems, floodwalls, roads and highways, relocations, paving and drainage.

NEPA Compliance. The team member should have 10 or more years experience in NEPA compliance activities and preparation of Environmental Assessments and Environmental Impact

Statements for complex civil/site work projects. Experience is needed for levee system projects.

ATR Team Leader. The ATR Team Leader should have 10 or more years experience with Civil Works Projects and have performed ATR Team Leader duties on complex civil works projects.

c. IEPR Panel Qualifications. The IEPR panel should be comprised of members with the following expertise:

Hydrology and Hydraulics (H&H) Panel Member. The H&H Panel Member should be a registered professional from academia, a public agency, or an Architect-Engineer or consulting firm with 15 or more years experience in conducting and evaluating hydrologic and hydraulic analyses for flood risk management projects. The Panel Member should be experienced in Flood Damage Reduction Projects, including large earth-fill, rock-fill, concrete or combination dams or systems of dams with their many hydraulic appurtenances such as gated and un-gated spillways, stilling basins, outlet works, control gates and valves, power intake structures, tunnels, conduits and approach and diversion channels and appurtenant control structures; and/or Local Flood Damage Reduction Projects including levees; floodwalls; gravity outlet and gate closure structures; pumping stations; detention basins; storm drainage structures; lined and unlined flood control channels and improvement structures. Active participation in related professional societies is encouraged.

Geotechnical Engineering Panel Member. The Geotechnical Engineering Panel Member should be a registered professional from academia, a public agency, or an Architect-Engineer or consulting firm with 20 years or more experience in geotechnical and earthquake engineering for critical flood risk management infrastructure and dam safety evaluations. The panel member should be a recognized expert in the geotechnical analysis and design of earthen dams and floodwalls, have experience in preparation of contract specifications, and demonstrate significant experience in the construction and safety evaluation of earthen dams.

Structural Engineering Panel Member. Structural Engineer should be a registered professional from academia, a public agency, or an Architect-Engineer or consulting firm with extensive experience in design of hydraulic structures for large and complex civil works projects including floodwalls and drainage features, etc.. Designs may involve unusual stresses because of size and shape, loading conditions resulting from unbalanced earth pressures, settlement and creeping of earth fills.

Civil Engineering Panel Member. The Civil Engineer should be a registered professional from academia, a public agency, or an Architect-Engineer or consulting firm with extensive experience in design of major flood control structures including earthen dams, levees, guide dikes and channels. Experience utilizing riprap protection, soil cement or concrete in design of levees, guide dikes and channels for large civil works projects is required. Practical knowledge of construction methods and techniques as it relates to these types of projects including earthwork, erosion control, hydraulic structures, interior drainage, site grading, roadwork, and concrete work is encouraged.

b. Review Team Roster. The Review Team Roster for the River Road Dike and Floodwall will include the following representatives:

Discipline/Role	Name	Agency/Office	Phone No.
SPL District Leads include:			
Project Team Leader	John Lei	CESPL-ED-DB	(213) 452-3702
SPL Project Manager	Thomas Bucklew	CESPL-PM-I	(213) 280-9511
Structural Engineer			
Geotechnical Engineer			
Materials Engineer			
Hydraulic Engineer			
Cost Engineer			
Landscape Architect			
Environmental			
Real Estate			
Construction Engineer			
Construction Engineer			
ATR Team includes:			
ATR Team Leader			
Civil Engineer			
Geotechnical Engineer			
Hydraulic Engineer			
Structural Engineer			
Environmental Specialist			
IEPR Panel includes:			
Hydraulic Engineer			
Geotechnical Engineer			
Structural Engineer			
Civil Engineer			

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## APPENDIX F

### SAMPLE CERTIFICATION

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#### COMPLETION OF AGENCY TECHNICAL REVIEW

The Agency Technical Review (ATR) has been completed for the Design Documentation Report and Plans and Specifications for the \_\_\_\_\_, Prado Dam, California.

The ATR was conducted as defined in the project's Review Plan to comply with the requirements of EC 1165-2-209. During the ATR, compliance with established policy principles and procedures, utilizing justified and valid assumptions, was verified. This included review of: assumptions, methods, procedures, and material used in analyses, alternatives evaluated, the appropriateness of data used and level obtained, and reasonableness of the results, including whether the product meets the customer's needs consistent with law and existing US Army Corps of Engineers policy. The ATR also assessed the District Quality Control (DQC) documentation and made the determination that the DQC activities employed appear to be appropriate and effective. All comments resulting from the ATR have been resolved and the comments have been closed in DrChecks.

\_\_\_\_\_  
NAME

ATR Team Leader

\_\_\_\_\_  
Date

\_\_\_\_\_  
NAME

Project Manager

\_\_\_\_\_  
Date

\_\_\_\_\_  
Nate Snorteland

Review Management Office Representative

\_\_\_\_\_  
Date

#### CERTIFICATION OF AGENCY TECHNICAL REVIEW

Significant concerns and the explanation of the resolution are as follows:

As noted above, all concerns resulting from the ATR of the project have been fully resolved.

\_\_\_\_\_  
NAME

Chief, Engineering Division

\_\_\_\_\_  
Date