REVIEW PLAN

AMERICAN RIVER WATERSHED, CALIFORNIA
COMMON FEATURES
FLOOD RISK MANAGEMENT PROJECT

SACRAMENTO DISTRICT

APRIL 2010

US Army Corps
of Engineers ®

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1. PURPOSE AND REQUIREMENTS

a. Purpose. This Review Plan defines the scope and level of peer review for the American River Watershed, California, Common Features Flood Risk Management Project. This review plan covers both the interim Natomas Post Authorization Change Report (NPACR) and the subsequent American River Common Features General Reevaluation Report (ARCF GRR)

b. References

(1) Engineering Circular (EC) 1165-2-209, Civil Works Review Policy, 31 January 2010.
(2) Engineer Regulation (ER) 1110-2-12, Quality Management, 30 September 2006.
(3) CESPD Reg. 1110-1-8, Quality Management Plan, 30 December 2002.

c. Requirements. This Review Plan was developed in accordance with EC 1165-2-209, which establishes the procedures for ensuring the quality and credibility of the U.S. Army Corps of Engineers (USACE) decision and implementation documents through independent review. The ECs outlines three levels of review: District Quality Control, Agency Technical Review, and Independent External Peer Review. In addition to these three levels of review, decision documents are subject to policy and legal compliance review, and model certification/approval.

(1) 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). It is managed in the home district and may be conducted by staff in the home district as long as they are not doing the work involved in the study, or overseeing contracted work that is being reviewed. Basic quality control tools include a Quality Management Plan providing for seamless review, quality checks and reviews, supervisory reviews, Project Delivery Team (PDT) reviews, etc. Additionally, the PDT is responsible for a complete reading of the report to assure the overall integrity of the report, technical appendices, and the recommendations before approval by the District Commander. The Major Subordinate Command (MSC)/District quality management plans address the conduct and documentation of this fundamental level of review; DQC is not addressed further in this Review Plan.

(2) Agency Technical Review (ATR). ATR is an in-depth review, managed within USACE, and conducted by a qualified team outside of the home district that is not involved in the day-to-day production of the project/product. The purpose of this review is to ensure the proper application of clearly established criteria, regulations, laws, codes, principles, and professional practices. The ATR team reviews the various work products and assures that all the parts fit together in a coherent whole. ATR teams will be comprised of senior USACE personnel (Regional Technical Specialists (RTS), etc.), and may be supplemented by outside experts as appropriate. To assure independence, the leader of the ATR team shall be from outside the home MSC.

For ATR on decision documents, the Review Management Organization (RMO) generally will be the appropriate Planning Center of Expertise (PCX), e.g. for flood risk management (FRM) decision documents, the FRM PCX would manage the effort. For decision documents with multiple purposes (or project purposes not clearly aligned with the PCXs), the home MSC should designate a lead PCX to conduct the review after coordinating with each of the relevant Centers. There shall be appropriate consultation throughout the review with the allied Communities of Practice (CoPs) such as engineering and real estate, other relevant PCXs, and other relevant offices to ensure that a review team with appropriate expertise is

assembled and a cohesive and comprehensive review is accomplished. There shall be coordination with the Cost Engineering Directory of Expertise (DX), which will provide the cost engineering review and resulting certification. ATR efforts will include the necessary expertise to address compliance with applicable published policy. When policy and/or legal concerns arise during ATR efforts that are not readily and mutually resolved by the PDT and the reviewers, the district will seek issue resolution support from the MSC and HQUSACE in accordance with the procedures outlined in Appendix H of ER 1105-2-100, or other appropriate guidance.

(3) Independent External Peer Review (IEPR). IEPR is the most independent level of review, and is applied in cases that meet certain criteria where the risk and magnitude of the proposed project are such that a critical examination by a qualified team outside of USACE is warranted. Any work product, report, evaluation, or assessment that undergoes DQC and ATR also may be required to undergo IEPR under certain circumstances. A risk-informed decision, as described EC 1165-2-209, will be made as to whether IEPR is appropriate for that product. 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 selected using the National Academies of Science (NAS) policy for selecting reviewers. IEPR teams are not expected to be knowledgeable of Army and administration policies, nor are they expected to address such concerns. IEPR is divided into two types, Type I is generally for decision documents and Type II is generally for implementation documents.

A. Type I IEPR is conducted on project studies. It is of critical importance for those decision documents and supporting work products where there are public safety concerns, a high level of complexity, novel, or precedent-setting approaches; has significant interagency interest; has significant economic, environmental, and social effects to the nation; or where the Chief of Engineers determines that the project is controversial. However, it is not limited to only those cases and most studies should undergo Type I IEPR.

B. Type II IEPR, a Safety Assurance Review (SAR), shall be conducted on design and construction activities for hurricane and storm risk management and flood risk management projects, as well as other projects where existing and potential hazards pose a significant threat to human life. External panels will conduct reviews of the design and construction activities prior to the initiation of physical construction and, until construction activities are completed, periodically thereafter on a regular schedule. The reviews shall consider the adequacy, appropriateness, and acceptability of the design and construction activities in assuring public health, safety, and welfare. This study will not include design or construction: Type II IEPR is not addressed further in this plan. However, since the decision document is the basis of ultimate design, safety assurance will be incorporated into the project as appropriate.

(4) Policy and Legal Compliance Review. Decision documents will be reviewed throughout the study process for their compliance with law and policy. These reviews culminate in Washington-level determinations that the recommendations in the reports and the supporting analyses and coordination comply with law and policy, and warrant approval or further recommendation to higher authority by the Chief of Engineers. Guidance for policy and legal compliance reviews is addressed further in Appendix H of ER 1105-2-100. When policy and/or legal concerns arise during DQC or ATR that are not readily and mutually resolved by the PDT and the reviewers, the District will seek issue resolution support from the MSC and HQUSACE in accordance with the procedures outlined in Appendix H, ER 1105-2-100. The

home district Office of Counsel is responsible for the legal review of each decision document and certification of legal sufficiency.

(5) Model Certification/Approval. EC 1105-2-407 requires certification (for Corps models) or approval (for non-Corps models) of planning models used for all planning activities. The EC defines planning models as any models and analytical tools that planners use to define water resources management problems and opportunities, to formulate potential alternatives to address the problems and take advantage of the opportunities, to evaluate potential effects of alternatives, and to support decision-making. The EC does not cover engineering models used in planning. Engineering software is being addressed under the Engineering and Construction (E&C) Science and Engineering Technology (SET) initiative. Until an appropriate process that documents the quality of commonly used engineering software is developed through the SET initiative, engineering activities in support of planning studies shall proceed as in the past. The responsible use of well-known and proven USACE developed and commercial engineering software will continue and the professional practice of documenting the application of the software and modeling results will be followed.

2. STUDY INFORMATION

Decision Document. The purpose of the study is to identify flood-related issues in the American River Watershed, California, study area. The PDT for the ARCF GRR had completed the Feasibility Scoping Meeting milestone and was working towards the Feasibility Review Conference milestone. However, in July 2009 the PDT was directed to complete an interim Post Authorization Change Report for the Natomas Basin (NPACR) to receive consideration in a potential WRDA 2010. The ARCF GRR will be completed subsequent to the NPACR, with completion of the GRR anticipated in 2012. The decision document(s) will present planning, engineering, and implementation details of the recommended plan to allow final design and construction to proceed subsequent to approval of the recommended plan. The project in total is a General Reevaluation Report undertaken to evaluate structural and non-structural FRM measures including in-basin storage, re-operation of existing reservoirs, improvements to existing levees, construction of new levees, and other storage, conveyance and non-structural options. Because of the scope of the project an Environmental Impact Statement (EIS)/Environmental Impact Report (EIR) will be prepared. At direction from HQUSACE, the GRR is being cost shared 50 percent Federal, 50 percent non-Federal with the project sponsor, the State of California Central Valley Flood Protection Board (CVFPB). The CVFPB in turn has a local cooperation agreement with the Sacramento Area Flood Control Agency (SAFCA).

The basic authorizing Document for the Common Features (CF) project was the American River Watershed Supplemental Information Report dated 1996 (SIR) with a Chief of Engineers Report dated June 27, 1996. Congress authorized the CF project in WRDA 1996. The SIR identified 3 candidate plans with each of those plans including levee modifications on the American and Sacramento Rivers (not all the same for each plan), modifications to the telemetry system on the American River and a Flood Warning system on the American River. The authorized CF project included those modifications that were "common" to the candidate plans. The Chief's Report included a brief listing of the modifications that were believed to be necessary at that time.

Subsequent to the CF project being authorized a detailed analysis of the American and Sacramento Rivers was done to better determine the scope of the CF projects. The results of that analysis was described in the Supplemental Information Report (SIR), American River Watershed Project, California Main Report and SEIS/EIR Addendum (1st Addendum). That report made it clear that the levees on the American River and the east levees on the Sacramento River from

Natomas Cross Canal to Freeport were all necessary to ensure that the authorized project would provide the performance expected by the authorization. Therefore, work on any of these levee reaches are within the authorized project area. All of the levees were evaluated using the Risk based procedures to determine where levee modifications were required. Based on this analysis a plan of improvement was developed for the levees on the American and Sacramento Rivers. The details of the modifications are identified in the 1st Addendum. The PCA for the CF project was signed on July 13, 1998 and referred to the SIR and 1st Addendum. Generally these were:

- Cutoff walls in about 24 miles of the American River Levees

- Modification and/or raising of 12 miles of levees on the Sacramento River d/s of Natomas Cross Canal

- 3 new telemetered gages on the American River u/s of Folsom Dam

- Modify the flood warning system d/s of Nimbus Dam

In WRDA 1999 Congress provided additional authorization for the CF project. This authorization included additional modifications (cutoff walls and/or raises) for American River Levees (not in the original 1996 authority) that would result in the safe passage of the emergency release from Folsom Dam of 160,000 cfs with appropriate freeboard. It also included the authority for the Corps to modify and raise the south levee of the Natomas Cross Canal to match the performance of the CF project on the Sacramento River adjacent to Natomas and to raise the North levee of the Cross Canal to be equivalent in height to the south levee of the Natomas Cross Canal. This authorization did not change anything in the 1996 authorization.

A 2nd Addendum to the SIR was developed to describe the authorized modifications to the CF project provided in WRDA 1999. An amendment to the PCA was signed in 2007 to add the features authorized in WRDA 1999.

Subsequent to the 2nd Addendum being completed it was determined that the Sacramento River east levee from the American River to Freeport may be vulnerable to levee/foundation failures. This is based on new information not available prior to the 2nd Addendum being completed. The analysis of this area is not complete but an analysis of several areas in the Pocket and Pioneer area resulted in a determination that they needed to be modified in order to provide the performance expected of the CF project. It was determined that modifications to these sites were within the original authority and have been constructed under the existing PCA.

Therefore, to date the specifically identified areas of work within the overall CF project are those identified in the 1st Addendum, the 2nd Addendum, and the sites in the Pocket and Pioneer area.

a. If modifications of sites on the American and/or the Sacramento River levees are determined to be needed in addition to those already specifically identified then these will need to be reviewed to determine if the current authority allows the new sites to be included or if new specific authority from Congress will be required. This will be addressed as part of the NPACR and ARCF GRR and appropriate recommendations will be included in the reports.

b. Authorizations. Authorization for the American River Watershed Common Features project is provided by Section 101 of WRDA 1996 (Public Law 104-303) and Section 366 of WRDA 1999 (Public Law 106-53). Although portions of that project have been constructed, it is not completely constructed. Subsequent to authorization, additional information regarding deep

under seepage of levees has become available. The project partners have requested additional investigation into the remaining flood-related issues in the study area. HQUSACE has determined that the subsequent investigation be pursued as a GRR.

c. **General Site Description.** The American River Common Features study area includes approximately 12 miles of the north and south banks of the American River immediately upstream from the confluence with the Sacramento River; approximately 12 miles of the east bank of the Sacramento River immediately downstream of the Natomas Cross Canal (NCC) to the confluence with the American River; and approximately 5 miles of the north and south bank of the NCC immediately upstream of the confluence with the Sacramento River. The project area also includes the improvements to the Natomas East Main Drainage Canal (NEMDC) and Pleasant Grove Creek Canal (PGCC). These features collect flows from Pleasant Grove, Dry, Robla, and Arcade Creeks (collectively referred to as the east side tributaries). The east bank of the Sacramento River downstream from the American River to Freeport, where the levee ties into Beach Lake Levee, the southern defense for Sacramento, is also included in the project area.

d. **Project Scope.** The study will focus on FRM alternatives in the Sacramento and Natomas area and consider flood related issues associated with the American and Sacramento Rivers. The non-Federal sponsor's focus is FRM for the City of Sacramento and surrounding area.

e. **Problems and Opportunities.** The primary flood-related problems in the study area stem from the potential for levee failure. Conservative estimates of potential direct flood damages in the Sacramento area alone exceed $25 billion. In some areas, neighborhoods would experience flood depths of twenty feet or more when the levees fail. A flood of such magnitude and depth not only poses a serious risk to public health and safety, but it would cripple the State's economy, and the consequences of such an event would have far-reaching and long-term effects on the nation as well.

f. **Potential Methods.** Potential FRM measures range from modifying and/or increasing conveyance through raising and strengthening levees, widening channels and bypass areas, modifying weirs and bypasses. Non-structural floodplain management measures would also be considered.

g. **Product Delivery Team.** The PDT is comprised of those individuals directly involved in the development of the decision document. Individual contact information and disciplines are presented in Attachment 1. In accordance with the PMP, it is planned that the non-Federal sponsors will contribute in-kind services for project management; public involvement, coordination and outreach; environmental and HTRW studies; GIS mapping and graphics; hydrology studies, hydraulic analysis; civil engineering; geotechnical studies; real estate; planning and report development; and participating in reviews. All in-kind work products will undergo review by the PDT for a determination of adequacy; products will ultimately undergo DQC. Some products will undergo IEPR (described later in the Review Plan).

h. **Vertical Team.** The Vertical Team includes District management, District Support Team (DST) and Regional Integration Team (RIT) staff as well as members of the Planning of Community of Practice (PCoP). Specific points of contact for the Vertical Team can be found in Attachment 1.

Factors Affecting the Scope and Level of Review. Quality control will be reviewed through DQC, ATR, and Type I IEPR. Questions that must be considered in determining the scope and level of review are identified in column 1 of Table 1. The PDT's assessment of these questions in relation to this study is listed in column 2 of Table 1.

Table 1. Factors Affecting Scope and Level of Review

Questions to Determine Scope	American River Common Features Project
Will parts of the study be challenging?	The Natomas Basin is entirely surrounded by levees that provide flood risk management from the Sacramento River, American River, Natomas Cross Canal, the Natomas East Main Drainage Canal, and the Pleasant Grove Creek Canal. Levees along the American River and Sacramento River also protect areas of Sacramento within the North and South American River Basins. The presence of these features increases the complexity of the project.
Will the study report contain influential scientific information or be a highly influential scientific assessment?	It is not anticipated that the study will include influential scientific information.
Will the study have significant economic, environmental, and/or social effects to the Nation?	The study may have significant economic and environmental effects. An Environmental Impact Statement/Report (EIS/EIR) will be required for this study.
Will the study have significant interagency interest?	The study has local, state, and Federal interest.
Will the study have significant threat to human life/safety assurance?	The study includes levees in the vicinity of an urbanized area subjected to flooding and thus presents a threat to human life/safety.
Will the study be highly controversial?	The project has potential for public controversy.
Will the information in the decision document be based on novel methods, present complex challenges for interpretation, contain precedent-setting methods or models, or present conclusions that are likely to change prevailing practices?	It is not likely that the study will result in precedent-setting methods, models, or practices.
What are the likely study risks and the magnitude of the risks?	The moderate to high level risks identified by the PDT include: • Vegetation on Levee issues – there is the potential that the Corps vegetation on levee policy could generate controversy. • Public controversy. There is the potential for public controversy with this study. The risk will be somewhat mitigated by careful communications with the public in general.

3. AGENCY TECHNICAL REVIEW

a. General. ATR for this study will be managed by the FRM PCX with appropriate consultation by the allied Communities of Practice such as engineering and real estate. The ATR shall ensure that the product is consistent with established criteria, guidance, procedures, and policy. The ATR will assess whether the analyses presented are technically correct and comply with published USACE guidance, and that the document explains the analyses and the results in a reasonably clear manner for the public and decision makers. Members of the ATR team will be from outside the home district. The ATR lead will be from outside the home MSC. The leader of the ATR team will participate in milestone conferences and the Civil Works Review Board (CWRB) to address review concerns.

b. Products for Review. The products to undergo ATR for the study will include:

(1) In-kind technical contributions from non-Federal sponsors.

(2) Without-project hydrology (SPD requirement).

(3) Feasibility Scoping Meeting (FSM) documentation for the NPACR and ARCF GRR.

(4) Alternative Review Conference (ARC) documentation for the NPACR and ARCF GRR. (SPD requirement).

(5) Alternative Formulation Briefing (AFB) documentation for the NPACR and ARCF GRR.

(6) Draft report, including NEPA/environmental compliance documentation and technical appendices for the NPACR and ARCF GRR.

(7) Final report, including NEPA/environmental compliance documentation and technical appendices for the NPACR and ARCF GRR.

The FSM and AFB materials and supporting analyses warrant ATR because they provide the basis for HQUSACE to determine whether Washington-level agreement with the future without-project condition and support for the tentatively selected plan is warranted. The FSM and AFB submittal materials, draft reports, and supporting materials merit ATR because they will be released to the public for review and determine the public, stakeholder, state, other agency, and other interest group positions on the tentatively selected plan. The final reports and supporting analyses warrant ATR because they will provide the basis for the Chief of Engineers interagency coordination and the Chief's approval or further recommendation to the Secretary of the Army and the Congress, as needed.

ATR members will be provided with any significant public comments made during public meeting and on the products under review.

Each application of ATR should build upon any and all prior cycles of review for the study. Each ATR review iteration need only address incremental changes and additions to documents and analyses addressed in prior ATR reviews, unless the ATR team determines that certain subjects or aspects warrant revisiting due to other changes or a need to adequately understand a larger portion of the project.

c. **Required ATR Team Expertise.** The ATRT is comprised of individuals that have not been involved in the development of the decision document and were chosen based on expertise,

experience, and/or skills. The members roughly mirror the composition of the PDT and are predominantly from the Los Angeles District; the Plan Formulation and Geotechnical ATRT members are from Louisville District and St. Louis District, respectively. The respective members have the following expertise/experience:

- Project Planning: Team member will be experienced with the civil works process, watershed level projects, current flood damage reduction planning and policy guidance, and have experience in plan formulation for multipurpose projects, specifically integrating measures for flood risk management, ecosystem restoration, recreation, watersheds, and planning in a collaborative environment.
- Environmental Compliance: Team member will be experienced in NEPA/CEQA process and analysis, and have a biological or environmental background that is familiar with the project area and ecosystem restoration.
- Economics: Team member will be experienced in civil works and related flood risk reduction projects, and have a thorough understanding of HEC-FDA.
- Hydrology and reservoir operations – Team member will be an expert in the field of hydrology and reservoir operations, application of detention / retention basins, effects of best management practices and low impact development on hydrology, approaches that can benefit water quality, and extensive experience with Corps hydrologic models.
- Hydraulic Design – Team member will be an expert in the field of urban hydraulics, have a thorough understanding of the dynamics of the both open channel flow systems, and enclosed systems, application of levees and flood walls in an urban environment with space constraints. The team member will have an understanding of computer modeling techniques that will be used for this project (HEC-HMS, HEC-RAS, UNET, and TABS).
- Civil Design – This discipline may require a dedicated team member, or may be satisfied by structural or geotechnical reviewer, depending on individual qualifications. Team member will have experience in utility relocations, positive closure requirements and internal drainage for levee construction, and application of non-structural flood damage reduction, specifically flood proofing. A certified professional engineer is suggested.
- Geotechnical Engineering – Team member will be experienced in levee & floodwall design, post-construction evaluation, and rehabilitation. A certified professional engineer is recommended.
- Cost Engineering - Team member will be familiar with cost estimating for similar civil works projects using MCACES version MII. Team member will be a Certified Cost Technician, Certified Cost Consultant, or Certified Cost Engineer. A separate process and coordination is also required through the Walla Walla District DX for cost engineering.
- Real Estate - Team member will be experienced in federal civil work real estate laws, policies and guidance. Members shall have experience working with respective sponsor real estate issues.
- Cultural Resources - Team member will be experienced in cultural resources and tribal issues, regulations, and laws.

The PCX(s), in cooperation with the PDT and vertical team, will determine the final make-up of the ATR team. It is not anticipated that the public, including scientific or professional societies will be asked to nominate potential ATR members. The name, organization, contact information, credentials, and years of experience of each member are presented in Attachment 1.

d. Documentation of ATR. DrChecks review software will be used to document all ATR comments, responses, and associated resolutions accomplished throughout the review process. Comments should be limited to those that are required to ensure adequacy of the product. The four key parts of a review comment will normally include:

(1) The review concern – identify the product's information deficiency or incorrect application of policy, guidance, or procedures.

(2) The basis for the concern – cite the appropriate law, policy, guidance, or procedure that has not been properly followed.

(3) The significance of 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.

(4) The probable specific action needed to resolve the concern – identify the action(s) that the PDT must take to resolve the concern.

In some situations, especially addressing incomplete or unclear information, comments may seek clarification in order to assess whether further specific concerns may exist. The ATR documentation in DrChecks will include the text of each ATR concern, the PDT response, a brief summary of the pertinent points in any discussion, including any vertical coordination, and lastly the agreed upon resolution. The ATR team will prepare a Review Report which includes a summary of each unresolved issue; each unresolved issue will be raised to the vertical team for resolution. Review Reports will be considered an integral part of the ATR documentation and shall also:

(1) Disclose the names of the reviewers, their organizational affiliations, and include a short paragraph on both the credentials and relevant experiences of each reviewer.

(2) Include the charge to the reviewers prepared by the PCX in accordance with EC 1165-2-209, 7c.

(3) Describe the nature of their review and their findings and conclusions.

(4) Include a verbatim copy of each reviewer's comments and the PDT's responses.

ATR may be certified when all ATR concerns are either resolved or referred to HQUSACE for resolution and the ATR documentation is complete. Certification of ATR should be completed, based on work reviewed to date, for the AFB, draft report, and final report. A draft certification is included in Attachment 2.

4. TYPE I INDEPENDENT EXTERNAL PEER REVIEW

a. General. Type I IEPR is conducted for decision documents if there is a vertical team decision (involving the district, MSC, PCX, and HQUSACE members) that the covered subject matter meets certain criteria (described in EC 1165-2-209) where the risk and magnitude of the proposed project are such that a critical examination by a qualified team outside the USACE is warranted. Type I IEPR is coordinated by the appropriate PCX and managed by an Outside Eligible Organization (OEO) external to the USACE. Type I IEPR panels shall evaluate whether the interpretations of analysis and conclusions based on analysis are reasonable. To provide effective review, in terms of both usefulness of results and credibility, the review panels should be given the flexibility to bring important issues to the attention of decision makers; however, review panels should be instructed to not make a recommendation on whether a particular alternative should be implemented, as the Chief of Engineers is ultimately responsible for the final decision on a planning or reoperations study. Type I IEPR panels will accomplish a concurrent review that covers the entire decision document and will address

all the underlying engineering, economics, and environmental work, not just one aspect of the study. Whenever feasible and appropriate, the office producing the document shall make the draft decision document available to the public for comment at the same time it is submitted for review (or during the review process) and sponsor a public meeting where oral presentations on scientific issues can be made to the reviewers by interested members of the public. A Type I IEPR panel or OEO representative will participate in the CWRB.

b. Decision on Type I IEPR. The decision to conduct Type I IEPR is made by comparing EC 1165-2-209 criterion to the study, as shown in Table 2. Based on these factors, Type I IEPR will be conducted.

Table 2. Decision on Type I IEPR

EC 1165-2-209 Criteria	American River Common Features Project
Is there significant threat to human life?	The study includes levees in the vicinity of an urbanized area subject to flooding and thus presents a threat to human life/safety.
Is the total project cost more than $45 million?	The estimated project cost is $45 million or more.
Has the Governor of California requested a Type I IEPR?	The Governor has not requested a Type I IEPR.
Has the head of a Federal or state agency charged with reviewing the project study requested a Type I IEPR?	No requests have been received for a Type I IEPR for this study.
Will there be significant public controversy as to size, nature, or effects of the project?	The project has potential for public controversy.
Will there be significant public controversy as to the economic or environmental cost or benefit of the project?	The project has potential for public controversy based on the potential costs of the project.
Will the study be based on information from novel methods, present complex challenges or interpretation, contain precedent-setting methods or models, or present conclusions that are likely to change prevailing practices?	The Natomas Basin is entirely surrounded by levees that provide flood risk management from the Sacramento River, American River, Natomas Cross Canal, the Natomas East Main Drainage Canal, and the Pleasant Grove Canal. Levees along the American River and Sacramento River also protect areas of Sacramento within the North and South American River Basins. The presence of these features increases the complexity of the project.

c. Products for Review. Type I IEPR will be conducted on interim products for hydraulic and geotechnical design and economics before the draft report is released for public review. The full IEPR panel will receive the entire draft report, environmental impact statement and all technical appendixes concurrent with public and agency review. The final report to be submitted by the IEPR panel must be submitted to the PDT within 60 days of the conclusion of public review. A representative of the IEPR panel must attend any public meeting(s) held during public and agency

review of the draft report. The Sacramento District will draft a response to the IEPR final report and process it through the vertical team for discussion at the Civil Works Review Board (CWRB). An IEPR panel member must attend the CWRB. Following the CWRB, the Corps will issue final response to the IEPR panel and notify the public.

d. Required Type I IEPR Panel Expertise. The Type I IEPR panel members will be comprised of individuals that have not been involved in the development of the decision document and will be chosen based on expertise, experience, and/or skills. It is anticipated that the team will consist of 6 reviewers. The following types of expertise may be represented on the Type I IERP team:

1. Geotechnical Engineers -Three geotechnical engineers may be needed; one with general geotechnical engineering expertise, one with expertise in geotechnical risk analysis, and one with expertise in seismic characterization of soil and analyses. The general geotechnical engineer should have extensive experience in the evaluation and design of flood control structures and levee embankments. The geotechnical risk analysis engineer should have extensive experience in the application of probabilistic methods to geotechnical aspects of flood damage reduction planning studies. The geotechnical seismic analysis panel member should have extensive experience in liquefaction evaluations of flood control structures.
2. Hydraulic Engineering - One reviewer will be needed for hydraulic engineering; this reviewer should be familiar with the Corps application of risk and uncertainty in flood risk management studies and also familiar with corps hydrologic and hydraulic computer models.
3. Economics - One reviewer will be needed for economics; this reviewer will need experience with water resource economic evaluation and utilization of the HEC-FDA models.
4. Environmental Analysis - One reviewer will be needed for environmental analysis; this reviewer will be experienced in NEPA/CEQA process and analysis and should have experience with evaluating and conducting NEPA cumulative effects analysis for complex multi-objective public works projects.

The OEO will determine the final participants on the Type I IEPR panel. The name, discipline, credentials, and years of experience of each member is included in Attachment 1 of this Review Plan.

e. Documentation of Type I IEPR. DrChecks review software will be used to document Type I IEPR comments and aid in the preparation of the Review Report. Comments should address the adequacy and acceptability of the economic, engineering and environmental methods, models, and analyses used. Type I IEPR comments should generally include the same four key parts as described for ATR comments in Section 3. The OEO will be responsible for compiling and entering comments into DrChecks. The Type I IEPR panel will prepare a Review Report that will accompany the publication of the final report for the project and shall:

(1) Disclose the names of the reviewers, their organizational affiliations, and include a short paragraph on both the credentials and relevant experiences of each reviewer.

(2) Include the charge to the reviewers prepared by the PCX.

(3) Describe the nature of their review and their findings and conclusions.

(4) Include a verbatim copy of each reviewer's comments (either with or without specific attributions), or represent the views of the group as a whole, including any disparate and dissenting views.

The final Review Report will be submitted by the Type I IEPR panel no later than 60 days following the close of the public comment period for the draft decision document. The District will draft a

response report to the IEPR final report and process it through the vertical team for discussion at the CWRB. Following direction at the CWRB and upon satisfactorily resolving any relevant follow-on actions, the Corps will finalize its response to the Type I IEPR Review Report and will post both the Review Report and the Corps' final responses to the public website.

5. MODEL CERTIFICATION AND APPROVAL

a. General. The use of certified or approved models for all planning activities is required by EC 1105-2-407. This policy is applicable to all planning models currently in use, models under development, and new models. The appropriate PCX will be responsible for model certification/approval. The goal of certification/approval is to establish that planning products are theoretically sound, compliant with USACE policy, computationally accurate, and based on reasonable assumptions. The use of a certified or approved model does not constitute technical review of the planning product. Independent review of the selection and application of the model and the input data and results is still required through conduct of DQC, ATR, and, if appropriate, IEPR. Independent review is applicable to all models, not just planning models. Both the planning models (including the certification/approval status of each model) and engineering models anticipated to be used in the development of the decision document are described below.

b. Planning Model. The following planning models are anticipated to be used:

(1) HEC-FDA 1.2.4. (Certified) The Hydrologic Engineering Center's Flood Damage Reduction Analysis (HEC-FDA) program provides the capability for integrated hydrologic engineering and economic analysis for formulating and evaluating flood risk management plans using risk-based analysis methods. The program will be used to evaluate and compare the future with and without-project plans in the project area to aid in the selection of a recommended plan to manage flood risk.

(2) IWR-Planning Suite (Certified). This software assists with the formulation and comparison of alternative plans. While IWR-PLAN was initially developed to assist with environmental restoration and watershed planning studies, the program can be useful in planning studies addressing a wide variety of problems. IWR-PLAN can assist with plan formulation by combining solutions to planning problems and calculating the additive effects of each combination, or "plan." IWR-PLAN can assist with plan comparison by conducting cost effectiveness and incremental cost analyses, identifying the plans which are the best financial investments and displaying the effects of each on a range of decision variables.

(3) Various Habitat Evaluation Procedure models. The Ecosystem Restoration Planning Center of Expertise has responsibility for approving ecosystem output methodologies for use in ecosystem restoration planning and mitigation planning. The Ecosystem PCX will need to certify or approve for use each regionally modified version of these methodologies and individual models and guidebooks used in application of these methods. The PDT will coordinate with the Ecosystem PCX during the study to identify appropriate models and certification approval requirements.

As the study progresses, other models such as regional input-output models and ecosystem habitat models may be added. The PDT will coordinate all certification with the FCM PCX.

c. Engineering Models. The following engineering models are anticipated to be used:

(1) HEC-HMS 3.4. The Hydrologic Modeling System (HEC-HMS) is designed to simulate the precipitation-runoff processes of dendritic watershed systems. It is designed to be applicable in a wide range of geographic areas for solving the widest possible range of problems. This includes large river basin water supply, flood hydrology, and small urban or natural watershed runoff. Hydrographs produced by the program are used directly or in conjunction with other software for studies of water availability, urban drainage, flow forecasting, future urbanization impact, reservoir spillway design, flood damage reduction, floodplain regulation, and systems operation. This software program will be used to create inflow hydrographs for development of the with- and without-project conditions.

(2) HEC-RAS 4.0. The Hydrologic Engineering Center's River Analysis System (HEC-RAS) provides one-dimensional steady and unsteady flow river hydraulics calculations, sediment transport-mobile bed modeling, and water temperature analysis. The HEC-RAS software supersedes the HEC-2 river hydraulics package, which was a one-dimensional, steady flow water surface profiles program. This software program will create the water surface profile elevations for the with- and without-project conditions.

(3) FLO-2D. FLO-2D is a volume conservation flood routing model. The model will simulate river overbank flows, but it can also be used on unconventional flooding problems such as unconfined flows over complex alluvial fan topography and roughness, split channel flows, mud/debris flows, and urban flooding. This software program will be used to develop economic floodplains for the benefits analysis of the with- and without-project conditions.

(4) Groundwater Modeling System (GMS), Version 6.5: This model is used to conduct seepage analysis.

(5) Utexas, Version 4: This model is used to conduct slope stability analysis.

d. Cost Estimating Model. MCACES / MII is an integrated cost estimating system. Either MCACES or MII (second generation of MCACES) will be used to prepare cost estimates.

6. REVIEW SCHEDULES AND COSTS

a. ATR Schedule and Cost. The ATR schedule is shown in **Error! Not a valid bookmark self-reference.**. Additional details for the ARCF GRR will be added to this table schedule when the time period for additional reviews draws closer. All products for these milestones will be reviewed, including those produced as in-kind services by the non-Federal sponsors.

b. A Value Engineering study will be conducted in the period between the F3 Conference (Feasibility Scoping Meeting) and the F4 Conference (Alternative Review Conference). The aim of the VE studies should be to ensure that the widest range of engineeringly feasible and cost efficient measures are considered and that alternatives formulated from those measures are not limited to those that first come to mind at the initiation of the study. Putting this step into the process ensures consideration of the fullest range of measures and alternatives. The results will be presented in the feasibility report – integrated into the discussion of the formulation of alternatives. In implementing this policy, the agency technical review team should act as the core of the feasibility VE team.

Table 3. ATR Schedule for Natomas PAC

Task	Date
ATR team participation in Technical Review Strategy Session	January 2008
ATR review of in-kind technical work	February 2009
ATR review of without-project hydrology	February 2009
ATR Feasibility Scoping Meeting documentation	January 2010
ATR Alternatives Review Conference documentation	March 2010
ATR Alternatives Formulation Briefing documentation	April 2010
Draft report, including NEPA/environmental compliance documentation and technical appendices	June 2010
Final report, including NEPA/environmental compliance documentation and technical appendices	August 2010

The Sacramento District shall provide labor funding by cross charge labor codes. Funding for travel, if needed, will be provided through 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. 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. ATR review is estimated to be $160,000 for the study.

c. Type I IEPR Schedule and Cost. The Type I IEPR schedule for the NPACR is shown in Table 4. Additional details for the ARCF GRR will be added to this schedule when the time period for additional review draws closer. Interim products for hydrology, hydraulic, geotechnical design, and economics will be provided to the panel before the Feasibility Scoping Meeting milestone. The full Type I IEPR panel will receive the entire draft feasibility report, environmental impact statement, and all technical appendices concurrent with public and agency review. The final report to be submitted by the Type I IEPR panel must be submitted to the PDT within 60 days of conclusion of public review.

Table 4. IEPR Schedule for Natomas PAC

Task	Date
IEPR of Feasibility Scoping Meeting Interim Materials	February 2009
IEPR of Draft Report, environmental impact statement, technical appendices	June 2010

The Type I IEPR is estimated to be $450,000 for this study.

d. Model Certification/Approval Schedule and Cost. If model certification is needed or other planning models are added during the study, the PDT will coordinate model certification/approval with the appropriate PCX.

7. PUBLIC PARTICIPATION

Public involvement is anticipated throughout the ARCF GRR process. The non-Federal sponsors will take the lead in formulating and conducting the outreach and public involvement for the study while coordinating all efforts with the Corps. This primarily consists of coordinating the study scope, results, and solutions with the public; conducting public meetings and workshops; and responding to public inquiries. Table 5 shows anticipated public comment actions and dates. The schedule will be updated when the schedule for the remaining ARCF GRR activities is developed.

Table 5. Anticipated Public Comment Actions and Dates

Public Comment Action	Anticipated Date
Public comments or questions	Ongoing
Disseminate notice of intent	January 2008
Small group public meetings held by non-Federal sponsors	Periodically, as Early Implementation Projects are developed
Public scoping workshop	February 2008
Natomas PAC Draft report available for public review	June 2010
Public meeting to present results	July 2010

Release of the draft report for public review will occur after issuance of the AFB policy guidance memo and concurrence by HQUSACE. The District will make the draft decision document available to the public for comment at the same time it is submitted for review (or during the review process) and sponsor a public meeting where oral presentations can be made to the reviewers by interested members of the public. ATR and Type I IEPR reviewers will be provided with all public comments. Upon completion of the review periods, comments will be consolidated in a matrix and addressed, if needed. A summary of the comments and resolutions will be included in the document.

8. PCX COORDINATION

Review plans for decision documents and supporting analyses outlined in EC 1165-2-209 are coordinated with the appropriate PCXs based on the primary purpose of the basic decision document to be reviewed. The lead PCX for this study is the FRM PCX located at SPD. The FRM PCX will coordinate with the National Ecosystem Restoration Planning Center of expertise and Cost Engineering Directory of Expertise, as appropriate. This Review Plan will be coordinated with the FRM-PCX and submitted by the SPK Planning Chief, 916-557-6767 to the MSC Commander for approval. The PCX will be asked to manage the ATR and Type I IEPR review. The PCX is requested to nominate the ATR team. The approved Review Plan will be posted to the PCX and SPK websites. Any public comments on the Review Plan will be collected by SPK for resolution and incorporation as needed. Any public comments directed to either the PCX or to HQUSACE will be forwarded to SPK.

9. MSC APPROVAL

The MSC that oversees the home district is responsible for approving the Review Plan. Approval is provided by the MSC Commander. The commander's approval should reflect vertical team input (involving district, MSC, PCX, and HQUSACE members) as to the appropriate scope and level of review for the decision document. Like the PMP, the Review Plan is a living document and may change as the study progresses. Changes to the Review Plan should be approved by following the process used for initially approving the plan. In all cases the MSCs will review the decision on the level of review and any changes made in updates to the project.

10. REVIEW PLAN POINTS OF CONTACT

Questions and/or comments on this Review Plan can be directed to the following points of contact:

- SPK contact, Andrew Muha, Water Resource Planner, 916-557-6756
- PCX contact, Eric Thaut, Program Manager for the Planning Center of Expertise for Flood Risk Management, 415-503-6852

ATTACHMENT 1: TEAM ROSTERS

Table – Table include rosters and contact information for the current PDT, ATR team, vertical team, PCX points of contact, and Type I IEPR panel members.

Table 6. Project Delivery Team

Name	Discipline	Phone	Email
Dan Tibbitts	Project Manager	916-557-7372	Dan.P.Tibbitts@usace.army.mil
Jane Ruhl	Study Manager	502-315-6862	Jane.C.Ruhl@usace.army.mil
Andrew Muha	Plan Formulator	916-557-6756	Andrew.T.Muha@usace.army.mil
Mary Perlea	Geotechnical Engineer	916-557-7185	Mary.P.Perlea@usace.army.mil
Ethan Thompson	Hydraulic Engineer	916-557-7142	Ethan.A.Thompson@usace.army.mil
Jesse Schlunegger	Hydraulic Engineer	916-557-6777	Jesse.J.Schlunegger@usace.army.mil
Mark Boedtker	Tech Lead/Civil Engineer	916-557-6637	Markus.S.Boedtker@usace.army.mil
Laurine White	Hydrologist	916-557-7133	Laurine.LWhite@usace.army.mil
Marchia Bond	Hydrologist	916-557-7127	Marchia.V.Bond@useace.army.mil
Elizabeth Holland	Environmental Specialist	916-557-6763	Elizabeth.G.Holland@usace.army.mil
Melissa Montag	Cultural Resource Specialist	916-557-7907	Melissa.L.Montag@usace.army.mil
Timi Shimabukuro	Economics	916-557-5313	Timi.R.Shimabukuro@usace.army.mil
Gary Bedker	Economics	916-557-6707	Gary.M.Bedker@usace.army.mil
Kurt Keilman	Economics	916-557-7386	Kurt.Keilman@usace.army.mil
Sherman Fong	Cost Engineering	916-557-6983	Sherman.C.Fong@usace.army.mil
Bob Vrictochy	Cost Engineering	916-557-7336	Robert.D.Vrchoticky@usace.army.mil
Laurie Parker	Real Estate/Lands	916-557-6741	Laurie.S.Parker@usace.army.mil.
Ken Regaldo	Surveys	916-557-6659	Kenneth.RegaldoJr@usace.army.mil
Elizabeth Wegenka	GIS Specialist	916-557-7640	Elizabeth.A.Wegenka@usace.army.mil
Jim Henriksen	Cadastral Specialist/RE	916-557-7286	James.D.Henriksen@usace.army.mil
Debbie Odle	Budget Analyst	916-557-7602	Debra.M.Odle@usace.army.mil
Al Gross	P2 Unit	916-557-7037	Al.Gross@usace.army.mil

Table 7. Agency Technical Review Team

AGENCY TECHNICAL REVIEW TEAM

Name	Discipline	Years of Relevant Experience	Phone	Email
Roger Setters	ATR Chair/Plan Formulation	20	502-315-6891	Roger.D.Setters@usace.army.mil
Michael Hallisy	Economics	12	213-452-3815	Michael.JHallisy@usace.army.mil
Nedenia Kennedy	Environmental Coordinator	20	213-452-3856	Nedenia.L.Kennedy@usace.army.mil
Tiffany Kayama	Biologist	6	213-452-3845	Tiffany.R.Kayama@usace.army.mil
Steven Dibble	Cultural Resources/Archaeologist	18	213-452-3849	Steven.D.Dibble@usace.army.mil
Shih Chieh	Hydrologic Engineer	28	213-452-3571	Shih.H.Chieh@usace.army.mil
Shih Chieh	Hydraulics	28	213-452-3571	Shih.H.Chieh@usace.army.mil
TBD	Cost Engineering [1]	TBD	TBD	
Scott Loehr	Geotechnical Engineering	17	816-389-3601	Scott.A.Loehr@usace.army.mil
Francis Omoregie	Material Engineer	20	213-452-3799	Francis.A.Omoregie@useace.army.mil
Huma.Nisar	Civil Engineer	12	213-452-3665	Huma.M.Nisar@usace.army.mil
Steven Gale	Real Estate	20	602-640-2016 x265	Steven.R.Gale@usace.army.mil
Kim Carsell	Flood Risk Manager	2	916-557-7635	Kimberly.M.Carsell@usace.army.mil

[1]The cost engineering team member nomination will be coordinated with the NWW Cost Engineering Directory of Expertise as required. That DX will determine if the cost estimate will need to be reviewed by DX staff.

Table 8. Type I Independent External Peer Review Panel

Discipline	Name	Years of Experience	Credentials
Hydraulic Engineering	Andy Yung	21	PE
Economics	Darrel Kelsoe	25	BS Agricultural Economics
Environmental Resources	Paul Looney	27	M.S.
Geotechnical Engineering	Peter G. Nicholson	20	Ph.D., PE
Geotechnical Engineering	Greg Baecher	37	Ph.D.
Geotechnical Engineering	Bill Rudolph	30	C.E., G.E.

Table 9. Vertical Team

Name	Discipline	Phone	Email
Karen Berresford	District Support Team Mgr	415-503-6557	Karen.G.Berresford@usace.army.mil
Ken Zwickl	Regional Integration Team	202-761-4085	Kenneth.J.Zwickl;@usace.army.mil

Table 10. Planning Center of Expertise Points of Contact

Name	Discipline	Phone	Email
Eric Thaut[1]	Program Manager, PCX Flood Risk Management	415-503-6852	Eric.W.Thaut@usace.army.mil
Jodi Staebell	Operational Director, PCX Ecosystem Restoration	309-794-5448	Jodi.K.Staebell@usace.army.mil

ATTACHMENT 2: ATR CERTIFICATION TEMPLATE

STATEMENT OF AGENCY TECHNICAL REVIEW

AMERICAN RIVER WATERSHED, CALIFORNIA
COMMON FEATURES
FLOOD RISK MANAGEMENT
NATOMAS POST AUTHORIZATION CHANGE REPORT, ENVIRONMENTAL IMPACT STATEMENT/ENVIRONMENTAL IMPACT REPORT AND APPENDICES

The Sacramento District has completed the feasibility report, environmental impact statement/environmental impact report, and appendices of the American River Watershed, American River Watershed, California, Common Features, Natomas Post Authorization Change Report. Notice is hereby given that an agency technical review 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 result, including whether the product meets the customer's needs consistent with law and existing Corps' policy. The ATR was accomplished by an agency team composed of staff from multiple districts. All comments resulting from ATR have been resolved.

_____ _____
Agency Technical Review Team Leader Date

_____ _____
Chief, Planning Division Date

CERTIFICATION OF AGENCY TECHNICAL REVIEW

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

(*Describe the major technical concerns, possible impact, and resolution*)

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

Chief, Planning Division

Date

ATTACHMENT 3: ACRONYMS AND ABBREVIATIONS

Term	Definition	Term	Definition
AFB	Alternative Formulation Briefing	LRR	Limited Reevaluation Report
ASA(CW)	Assistant Secretary of the Army for Civil Works	MSC	Major Subordinate Command
ATR	Agency Technical Review	NED	National Economic Development
BOD	Basis of Design	NER	National Ecosystem Restoration
CSDR	Coastal Storm Damage Reduction	NEPA	National Environmental Policy Act
CVFPB	State of California Central Valley Flood Protection Board	O&M	Operation and Maintenance
CWRB	Civil Works Review Board	OMB	Office of Management and Budget
DPR	Detailed Project Report	OMRR&R	Operation, Maintenance, Repair, Replacement and Rehabilitation
DQC	District Quality Control	OEO	Outside Eligible Organization
DWR	California Department of Water Resources	OSE	Other Social Effects
DX	Directory of Expertise	PCX	Planning Center of Expertise
EA	Environmental Assessment	PDT	Project Delivery Team
EC	Engineer Circular	PAC	Post Authorization Change
EIS	Environmental Impact Statement	PMP	Project Management Plan
EO	Executive Order	PL	Public Law
ER	Ecosystem Restoration	QMP	Quality Management Plan
FDR	Flood Damage Reduction	QA	Quality Assurance
FEMA	Federal Emergency Management Agency	QC	Quality Control
FRM	Flood Risk Management	RED	Regional Economic Development
FSM	Feasibility Scoping Meeting	RTS	Regional Technical Specialist
GRR	General Reevaluation Report	SAR	Safety Assurance Review
HTRW	Hazardous, toxic, and radiological waste	SET	Science and Engineering Technology
HQUSACE	Headquarters, U.S. Army Corps of Engineers	USACE	U.S. Army Corps of Engineers
IEPR	Independent External Peer Review	WRDA	Water Resources Development Act