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Revision Aug 2009

LOWER SAN JOAQUIN RIVER, CALIFORNIA
Feasibility Study

PROJECT MANAGEMENT PLAN

CENTRAL VALLEY FLOOD PROTECTION BOARD
PUBLIC SAFETY AND FLOOD MANAGEMENT
STATE OF CALIFORNIA

SJAFCA
San Joaquin Area FLOOD CONTROL Agency

US Army Corps of Engineers®

CONCURRENCE PAGE

Sacramento District,
U.S. Army Corps of Engineers

We, the undersigned, concur with the Project Management Plan for the Lower San Joaquin River Feasibility Study, California. We understand that this is a **"living"** management document that will be updated as needed throughout the process stated within.

NAME	TITLE	SIGNATURE	DATE
Christine Altendorf	Deputy DE for PPMD	_____	_____
Frank Piccola	Ch, Planning Division	_____	_____
Kevin Knuuti	Ch, Engineering Division	_____	_____
Sharon Caine	Ch, Real Estate Division	_____	_____
Carl Korman	Ch, Office of Counsel	_____	_____
Judy Grant	Ch, Contracting Division	_____	_____

CONCURRENCE PAGE
Non-Federal Sponsors

We, the undersigned, concur with the Project Management Plan for the Lower San Joaquin River Feasibility Study, California. We understand that this is a **"living"** management document that will be updated as needed throughout the process stated within.

NAME	TITLE	SIGNATURE	DATE
Jay Punia	Executive Officer, CVFPB	_____	_____
Jim Giottonini	Executive Director, SJAFCA	_____	_____

Forward

This PMP was revised in August 2009 to better reflect efforts in the upcoming Fiscal Year and to refine original assumptions. Future revisions are expected as the planning process progresses.

Document Objectives

For the Lower San Joaquin River Feasibility Study (LSJRFS), the Project Management Plan (PMP) describes the pertinent management and planning methods, defines the activities to be accomplished, and establishes the schedule and budget necessary for successful completion of the feasibility phase. Feasibility reports, the product of the study, present the results of investigations conducted prior to Congressional Authorization of a project. The PMP reflects an agreement between the non-Federal sponsors and the Sacramento District regarding the procedures, scope, schedule, and budget associated with the planning process to develop an Integrated Feasibility Report and EIS/EIR.

In summary, the primary objectives of this PMP are to communicate the following about the study:

- Briefly describe the background of the project and watershed,
- Explain relevant management strategies for product development,
- Outline an appropriate planning methodology for the report,
- Establish the scope, budget, and schedule associated with successful completion.

Study Objective

The Corps uses feasibility reports to present the results of investigations conducted prior to and in support of a Congressional authorization of a project.

In the case of the LSJRFS the primary objective is to determine the extent of Federal interest in flood risk management and ecosystem restoration along the Lower San Joaquin River.

CONTENTS

TABLES

APPENDIXES

ACRONYMS

A/E	Architectural and Engineering
AFB	Alternative Formulation Briefing
ATRT	Agency Technical Review Team
CDFG	California Department of Fish & Game
CEQA	California Environmental Quality Act
CESPD	South Pacific Division
CVFPB	Central Valley Flood Protection Board
DM	Design Memorandum
DWR	California Department of Water Resources
EA	Environmental Assessment
EC	Engineer Circular
EIR	Environmental Impact Report
EIS	Environmental Impact Statement
EM	Engineer Manual
ER	Engineer Regulation
FCSA	Feasibility Cost-Sharing Agreement
FRC	Feasibility Review Conference
FWS	U.S. Fish and Wildlife Service
GIS	Geographic Information Systems
H & H	Hydrology and Hydraulics
HEP	Habitat Evaluation Procedures
HQUSACE	Headquarters, U.S. Army Corps of Engineers
HTRW	Hazardous, Toxic, and Radioactive Waste
IRC	Issue Resolution Conference
IPR	In-Progress Review
LEDPA	Least Environmentally Damaging Practicable Alternative
LERRDS	Lands, Easements, Right-of-ways, Relocations, and Disposal Sites
M-CACES	Micro-Computer Aided Cost Estimate System
MEC	Munitions and Explosives of Concern
MMRP	Military Munitions Rule Program
NMFS	National Marine Fisheries Service
NEPA	National Environmental Policy Act
OA	Other Agency
OC	Other Corps
OE	Other Expense
PED	Pre-construction Engineering and Design
PES	Project Executive Summary
PGM	Project Guidance Memorandum
PMP	Project Management Plan
PDT	Project Delivery Team
PRB	Project Review Board
QCP	Quality Control Plan
SACCR	Schedule and Cost Change Request
SJAFCA	San Joaquin Area Flood Control Agency

WBS	Work Breakdown Structure
WRDA	Water Resources Development Act

CHAPTER 1 - INTRODUCTION

PURPOSE AND SCOPE OF THE PMP

The purpose of this Project Management Plan (PMP) is to outline the initially identified study tasks, products, schedule, and cost estimates associated with conducting a cost-shared feasibility study through preparation of a final feasibility report for potential collaborative actions concerning the Lower San Joaquin River of Central California. The Lower San Joaquin River Feasibility Study (LSJRFS) PMP defines a contract between the Corps of Engineers, Sacramento District (CESPK) and the non-Federal sponsors (The Central Valley Flood Protection Board (CVFPB) for the State of California) and the San Joaquin Area Flood Control Agency (SJAFCA), representing the City of Stockton and San Joaquin County. The PMP will evolve as the study evolves and help define the project management plan for project implementation and design agreement, and concludes with support during the Washington-level review of the final feasibility report.

The PMP is a basis for change. The non-Federal sponsors and CESPK will develop/further refine the technical Scopes Of Work (SOW) for this study. Once these SOW are written, this PMP will be revised to reflect the work that will be done by and at the direction of the CESPK and by the sponsor to receive work-in-kind credit. The scope and level of detail of this PMP will likely change over the duration of the study as more information and/or resources become available. The PMP will be used as the principle tool for managing the feasibility study. Each study team member, including the non-Federal sponsor, will receive a copy of this document and any updates.

The PMP is a basis for the review and evaluation of the feasibility report. Since the PMP represents a contract among study participants, it will be used as the basis to determine if the draft feasibility report has been developed in accordance with established procedures and previous agreements. The PMP reflects mutual agreements of the district, division, sponsor and U.S. Army Corps of Engineers Headquarters (HQUSACE) into the scope, critical assumptions, methodologies, and level of detail for the studies that are to be conducted during the feasibility study. Review of the draft report will be to ensure that the study has been developed consistent with these agreements. The objective is to provide early assurance that the project is developed in a way that can be supported by higher headquarters.

The PMP is a study management tool. It includes the SOW that is used for funds allocation by the project manager. It forms the basis for identifying commitments to the non-Federal sponsor and serves as a basis for performance measurement.

KEY ASSUMPTIONS AND CAVEATS

It is recognized that this initial PMP for the LSJRFS is considered to be a living document, which is subject to change and revision in the future as needed. Presently, key assumptions are:

- Current total estimated cost for the LSJRFS is expected to be **$11,338,150.**
- Based on 50/50 cost sharing of the total study cost, **$5,619,075** would be the responsibility of the non-Federal sponsors and **$5,719,075** would be the responsibility of the Corps. With the difference in amounts due to the anticipated Independent External Peer Review, which is 100 percent Federal cost.

- This PMP reflects a WIK estimate of $2,836,251 and a cash requirement of $2,782,824. However, up to **$5,619,075** of the non-Federal requirement may be in the form of in-kind credit for work performed after the execution of this agreement, subject to Corps audit.

- Other work performed/data collected that will benefit the study development, but was performed prior to the execution of a cost-sharing agreement, is not creditable, but will reduce overall study costs and timeline.

- Because of the critical need for immediate flood damage reduction measures in the Lower San Joaquin River Basin, it is understood that the non-Federal sponsor will be making multiple requests for Section 104 (WRDA 96) crediting for measures expected to be part of the final recommended plan.

SUMMARY OF PROJECT MANAGEMENT PLAN CONTENTS:

This PMP is comprised of the following chapters:

- Chapter 1 – Purpose and Scope. This chapter includes the definition of the PMP for the LSJRFS and a summary of the PMP requirements.

- Chapter 2 – Study Background. Section 905(b) Analysis and Feasibility Study Focus. This chapter includes information concerning study authority, approved Section 905(b) Analysis including plans formulated to date, key issues, and the focus of the LSJRFS based to a significant extent on the Section 905(b) Analysis.

- Chapter 3 – Management of Feasibility Study. This chapter defines the study management structure including the Project Delivery Team (PDT) and Executive Committee. It also highlights the types and purposes of various study management documents.

- Chapter 4. – Feasibility Study Products. This chapter explains the types of feasibility study products. It also provides a listing of the technical requirements that the feasibility study and its elements and processing are to follow.

- Chapter 5 – Study Cost Estimate and Tasks. This chapter provides a summary of study costs for major study tasks and a breakdown of those costs between Federal and non-Federal interests. It also includes a description of the major study tasks and subtasks that makeup the work to be accomplished, in narrative form, that answers the questions: "what, how, and how much".

- Chapter 6 – Study Milestones and Schedule. This chapter defines the key milestones or decision points for the feasibility study. It also includes an estimate of the schedule for accomplishing the study tasks and products.

- Chapter 7 - Quality Control Plan: This chapter supplements the district's Quality Control Plan. It highlights any deviations to the district's plan and lists the members of the study team and the independent review team.

CHAPTER 2 – SECTION 905(b) ANALYSIS AND FEASIBILITY STUDY FOCUS

STUDY AUTHORIZATION

The LSJRFS will be accomplished generally in accordance of the Corps Section 905(b) Analysis (WRDA 1986) dated 23 September 2004. The Section 905(b) Analysis was approved by Commander, South Pacific Division (SPD) on 10 June 2005. The Section 905(b) Analysis was prepared in response to House Report 105-190, which accompanied the Energy and Water Development Appropriations Act of 1998 (PL 105-62). This act authorized the Sacramento and San Joaquin River Basins Comprehensive Study (Comprehensive Study). Authorizing language for the Comprehensive Study is:

> *"Sacramento River and San Joaquin River Basins Comprehensive Study, California.* In response to the devastating floods of 1997, the Committee has added funds and directs the Corps of Engineers to conduct a comprehensive assessment of the entire flood control system within the existing study authorizations of the Sacramento River Watershed Management Plan (authorized by the Flood Control Act of 1962) and the San Joaquin River and Tributaries authority (authorized by 1964 Resolution of the House Committee on Public Works). These comprehensive investigations will include: (1) preparation of a comprehensive post-flood assessment for the California Central Valley (Sacramento River Basin and San Joaquin River Basin), (2) development and formulation of comprehensive plans for flood control and environmental restoration purposes, and (3) development of a hydrologic/hydraulic model of the entire system including the operation of the existing reservoirs for evaluation of the current flood control system. Not later than 18 months after the date of enactment of the Act the Secretary shall transmit an interim report describing results of the post-flood assessment and the assessment of the existing flood control system and its deficiencies. "

The Comprehensive Study was initiated in Fiscal Year 1998. A post-flood assessment and system-wide hydrologic/hydraulic model have been completed as well as extensive public involvement and planning for flood damage reduction and ecosystem restoration purposes.

Additional investigations are needed to develop and formulate plans for flood risk management and ecosystem restoration purposes along the lower San Joaquin River. Funds in the amount of $100,000 were appropriated in Fiscal Year 2004 to develop the Section 905(b) Analysis for the Lower San Joaquin River. Following completion of the Section 905(b) Analysis, non-Federal interest in the study diminished and unexpended funds were reprogrammed into other projects. In response to renewed non-Federal interest in Fiscal Year 2007, funds were reprogrammed back into the project for development of this PMP.

STUDY AREA

The area of study area for the LSJRFS is along the lower (northern) portion of the San Joaquin River system in the Central Valley of California. The San Joaquin River originates on the western slope of the Sierra Nevada and emerges from the foothills at Friant Dam. The river flows west to the Central Valley, where it is joined by the Fresno, Chowchilla, Merced, Tuolumne, Stanislaus and Calaveras rivers, and smaller tributaries as it flows north to the Sacramento-San Joaquin Delta. The primary study area as described in the Section 905(b) Analysis includes the main stem of the San Joaquin River and its floodplains from the Mariposa Bypass downstream to the city of Stockton. This includes the distributor channels of the San Joaquin River in the

southernmost reaches of the Delta: Paradise Cut and Old River as far north as Tracy Boulevard and Middle River as far north as Victoria Canal.

On the basis of continued coordination with local interests along the San Joaquin River, the primary study area for the LSJRFS will also include the city of Stockton extending from the Calaveras River, Mormon Slough, and Bear Creek and tributaries north of Stockton to the Little Johns Creek and Farmington Dam areas southeast of Stockton and north of Stockton including the Lodi WWTP at Thornton Road and Interstate 5. A general layout of the primary study area is included in Figure 1.

The overall study area includes those areas adjacent to the primary study area which could be influenced by potential actions to address the identified problems and needs.

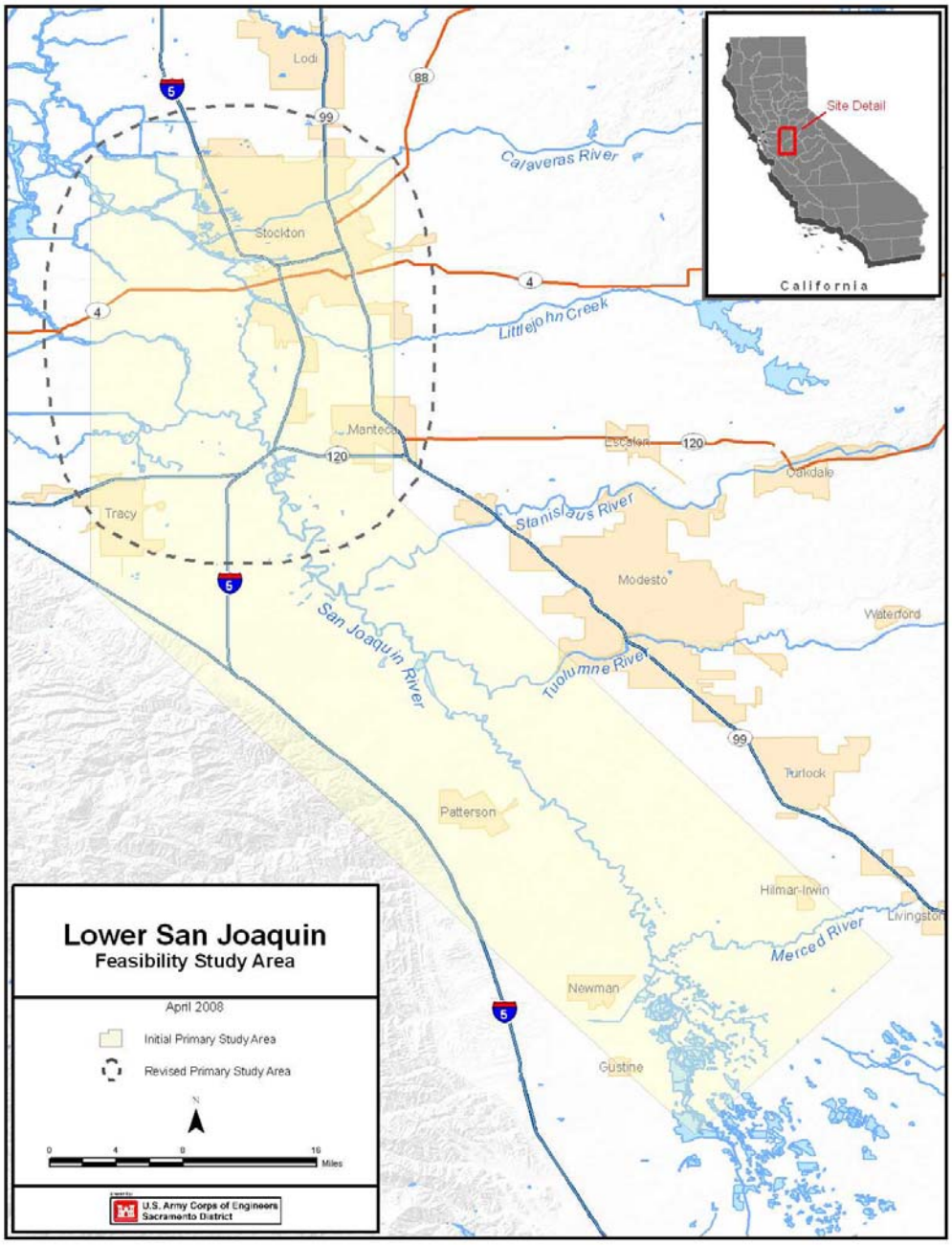

FIGURE 1. MAP SHOWING THE PRIMARY STUDY AREA FOR THE LSJRFS

RESULTS OF THE SECTION 905(b) ANALYSIS

As mentioned, the Section 905(b) Analysis was completed in accordance with Corps criteria on 23 September 2004. It was approved by the Commander South Pacific Division on 10 June 2005. The Section 905(b) Analysis concluded with a recommendation that the Lower San Joaquin River study proceed into the feasibility phase.

Resources Problems and Needs

Following is a summary of the identified resources problems and needs in the primary study area. They were identified as part of various reports.

Flood Damages

Major flooding occurred in San Joaquin, Stanislaus, and Merced counties along the lower San Joaquin River in 1983, 1986, 1995 and 1997. The distribution of flood damages among the three counties has varied considerably depending upon storm paths. However, the highest magnitude of damages occurred to agricultural crops and developments. The 1997 flood event did, however, damage 1,842 residences, mobile homes, and businesses in San Joaquin and Stanislaus counties. Estimated average annual equivalent damages (year 2000) from floods in the Lower San Joaquin River Basin amount to about $20 million based on preliminary HEC-FDA model for the Comprehensive Study. Crop damages ($9 million) account for nearly half of the estimated damages.

There is some evidence to suggest that sediment deposition has contributed to reducing channel capacities and contributed to flood problems within the study area. Past farming practices directed sediment-laden agricultural drainage from fields to the river. Current practices are attempting to retain agricultural drainage on site. Upstream diversions on the San Joaquin River and tributaries have reduced the frequency of high flows, thereby reducing the transport of sediment through the river system.

The portion of the study area between Stockton and Tracy has experienced significant development within the past decade. The River Islands master planned community is currently proposed for 5,000 acres of the Stewart Tract between Paradise Cut, the San Joaquin River, and Old River. Applications for Corps and CVFP Board permits are currently pending. The proposed project would increase the conveyance capacity of Paradise Cut by setting back approximately 20,000 feet of existing levee and dry excavating approximately 3,000,000 cubic yards of material within the levee setback area. Paradise Cut is a bypass channel connecting to the San Joaquin River and increasing conveyance in the upstream portion of the San Joaquin River.

Flood damages along the San Joaquin River will likely continue to increase due to population growth and urban development. Although new structures will need to comply with land use regulations pursuant to the National Flood Insurance Program (NFIP), there will continue to be increases in flood damages due to residual risks from floods exceeding designed levels of protection, increased flood damages to automobiles and other property outside of regulated structures, and improvements to existing structures in the floodplain that increase the amount of property exposed to potential flood damages.

Stockton Section 211 Project

The San Joaquin Area Flood Control Agency (SJAFCA) is a joint powers authority created in 1995 between the City of Stockton, San Joaquin County, and the San Joaquin County Flood Control and Water Conservation District in response to the Federal Emergency Management Agency's (FEMA) attempt to issue new Flood Insurance Rate Maps (FIRMs). These maps would have placed a majority of metropolitan Stockton and a portion of the surrounding County areas in a floodplain. SJAFCA was able to convince FEMA to delay issuing the maps until November 1998 while SJAFCA constructed the Flood Protection Restoration Project (FPRP). The FPRP consists of flood wall and levee improvements along 40 miles of existing channel levees, 12 miles of new levees, modifications to 29 bridges and the addition of two major detention basins and pumps. SJAFCA completed construction of the FPRP in 1998 which removed most of the City from the 100-year flood zone.

Section 211 of the Water Resources Development Act of 1996 (WRDA'66) authorized the local sponsor (SJAFCA) to construct flood control improvements and receive reimbursement for the Federal share of project costs. The Federal share of the plan approved by the Corps and the Office of Management and Budget (OMB) is estimated at $36.7 million. SJAFCA is working with the Corps on a final audit of the total reimbursement amount.

The FPRP focused on improvements primarily to urban areas of Stockton. In addition, it relied on hydraulic criteria prevailing at the time had levee freeboard 3 feet above the 100-year base flood elevation. The SJAFCA is interested in identifying potential project features to improve flood protection to urban areas. In addition, current USACE levee certification criteria now require a risk and uncertainty based approach to setting water surface elevations as well as a systems approach. There may be the potential that the completed project may be found not certifiable under the new criteria. Further, hurricane Katrina has demonstrated that there remains a relatively high threat to life and properties to areas only possessing a 1 percent probability of flooding in any year and SJAFCA is interested in assessing the potential for further increases in flood protection to urban areas.

Also, the nationwide FEMA remapping program has put into question a number of levees in the SJAFCA area and in San Joaquin County. FEMA is scheduled to place the areas behind these levees into the 100-year floodplain.

Ecosystem Restoration

A major problem with the San Joaquin River ecosystem is that hydraulic and geomorphic processes have been severely compromised by flow regulation and confinement of the river by levees and bank protection along portions of the channels. Changes to these processes including confinement of flood flows by levees and has disconnected portions of the rivers from their floodplains, interrupting nutrient cycles and geomorphic processes, including sediment deposition, scouring and channel meandering. These changes have caused significant effects on the establishment and survival of riparian and wetland vegetation and on the quality of the associated aquatic habitat. They have contributed to declining populations of many plant, fish and wildlife species associated with these habitats.

Riparian vegetation (including wetlands) makes up less than 0.5 percent of the total land area in California. Estimates of the historical extent of riparian forests in the San Joaquin Valley range as high as 900,000 acres. It has recently been estimated that the remaining riparian habitat includes only 6,400 acres of woodland.

The pervasive loss of habitats in the San Joaquin Valley has resulted in many plant and

animal species becoming scarce. In addition, the remnant wetlands in the San Joaquin Valley attract many species of migratory birds, some of which are threatened by the loss of their breeding habitats or other factors. Thirty-seven species listed under the Federal or California Endangered Species Acts have the potential to occur in the lower San Joaquin River region. A number of additional sensitive species, including State-listed species are also known to occur, or have the potential to occur, within the study area.

The loss of wetland, riparian and aquatic habitats, special-status species, salmon populations, exotic vegetation, and water quantity and quality have been identified in numerous studies as major environmental concerns in the San Joaquin Valley. There is a significant need to include ecosystem restoration into any plan including consideration of flood damage reduction in the area.

Other Resource Needs

With the passage of the State of California Disaster Preparedness and Flood Prevention Bond Act of 2006 (Proposition 1E) and the States Safe Drinking Water, Water Quality and supply, flood Control, River and Coastal Protection Bond Act of 2006 (Proposition 84) in November 2006, the State has funding to significantly improve its flood management programs and infrastructure. Proposition 1E allocates funds to repair and improve State-Federal project facilities that are part of the State Plan of Flood Control for the Central Valley, and to reduce the risks of levee failure in the Sacramento-San Joaquin Delta.

A major challenge of the LSJRFS will be coordinating the combining flood damage reduction and ecosystem restoration project elements with other ongoing water resources programs. Programs such as the CALFED Bay-Delta Program, Central Valley Project Improvement Act (CVPIA), the San Joaquin River Restoration Program, the Central Valley Flood Protection Plan, Bay Delta Conservation Plan (BDCP), and Delta Vision (DV) are proposing, or likely to propose, significant initiatives in the study area. The intent of the other programs is to achieve benefits such as water supply, ecosystem restoration, water quality, and levee strengthening.

In an effort to aid in coordination, in FY10 the PDT will be meeting as needed with team members from the above mentioned efforts, and others. Additionally, these other efforts are working hard to create working groups, by region, that will aid coordination. Specifically, a member of the study effort will be the designated representative for the Lower San Joaquin Basin Working Group. At this time, that designee is Scott Miner.

Alternatives Considered

A broad number of potential resource management measures were considered in the Section 905(b) Analysis. These measures were originally developed for the Comprehensive Study, which did not include consideration of improvements in the Stockton area. For flood damage reduction, these measures ranged from adding, modifying, and/or re-regulating storage on major tributaries and new transitory storage within the flood plains to increasing conveyance through raising levees, widening channels and floodway areas, dredging, and constructing/modifying weirs and bypasses. Also included were various floodplain management measures. For ecosystem restoration, measures ranged from restoring riparian, wetlands, and floodplain habitats to constructing setback levees for habitat.

A series of preliminary plans were formulated from the resource management measures.

Various single purpose and multiple purpose preliminary plans were developed and evaluated. From these plans, various measures believed having a high potential to address the primary study objectives of flood damage reduction and ecosystem restoration were prepared. It was concluded that in the next iteration of alternatives for the feasibility study that these measures would be developed into various alternative plans. These plans, which would include consideration of potential residual flood problems in the Stockton, Manteca, and Lathrop portions of the study area would include floodplain management measures; nonstructural flood damage reduction with ecosystem restoration; conveyance and transient storage improvements with ecosystem restoration; single-purpose ecosystem restoration; new, modified, or reoperated reservoirs; and locally-developed plans.

FOCUS OF THE FEASIBILITY STUDY

Feasibility Study Objectives

The primary planning objectives within the LSJRFS study area are as follows:

- Reduce the risk of flooding to people and property, and economic damages due to flooding within the primary study area.
- Develop a sustainable flood management system for the future, as well as a plan to address and communicate residual flood risks.
- Reduce the risk of adverse consequences of floods when they do occur.
- Restore the quantity, quality, diversity, and connectivity of riparian, wetland, floodplain, and shaded riverine aquatic habitats where appropriate.

The State has identified a goal of providing a level of protection to urban areas at least equal to a 0.5 percent chance (1 in 200 chance event) of occurrence in any one year.

Planning considerations identify factors that must be addressed in developing an implementable plan. These planning considerations are subordinate to national objectives, planning objectives and planning constraints in the process of identifying a Federally-supportable plan. In some cases, it may not be possible to completely satisfy all off the following planning considerations because trade-offs may be required among these considerations:

- Minimize-life cycle construction, operation and maintenance costs relative to benefits, consistent with the NED and NER objectives.
- Minimize environmental mitigation requirements by using environmentally-sustainable engineering methods to accomplish flood damage reduction.

The national or Federal objective of water and related land resources planning is to contribute to national economic development consistent with protecting the Nation's environment, pursuant to national environmental statutes, applicable executive orders, and other Federal planning requirements. Contributions to National Economic Development (NED) are increases in the net value of the national output of goods and services, expressed in monetary units. Contributions to NED are the direct net benefits that accrue in the planning area and the rest of the Nation.

The Corps has added a second national objective for ecosystem restoration in response to legislation and administration policy. The National Ecosystem Restoration (NER) objective is to contribute to the Nation's ecosystem through ecosystem restoration, with contributions measured by changes in the amounts of ecological output.

Changes to Approved Section 905(b) Analysis

The approved Section 905(b) Analysis was for the portion of the San Joaquin River extending from the Mariposa Bypass downstream to City of Stockton and several distributary channels of the San Joaquin River in the southernmost reaches of the Delta. This did not include the City of Stockton or areas generally east of the San Joaquin River near Stockton. Neither did the Comprehensive Study. This is primarily because there was an ongoing project in the Stockton area in the late 1990's. As mentioned, the current boundaries of the LSJRFS also include the city of Stockton and adjacent areas.

On the basis of continued coordination with local interests along the San Joaquin River, the primary study area for the LSJRFS will include the mainstem of the Lower San Joaquin River and its flood plains generally downstream from the Stanislaus River. This includes the southernmost reaches of the Delta: Paradise Cut and Old River as far north as Tracy Boulevard and Middle River as far north as Victoria Canal. In the Stockton area this will include the city of Stockton extending from the Calaveras River, Mormon Slough, and Bear Creek and tributaries north of Stockton to the Little johns Creek and Farmington Dam areas southeast of Stockton.

Potential alternatives for flood damage reduction are to include levee and channel improvements in the primary study area. In addition, upstream detention storage and reoperation of existing reservoirs are to be evaluated. Further, in accordance with State Senate Bill 5 (2007) there is to be an investigation of the feasibility of a potential bypass/floodway that would reduce flood stages in the San Joaquin River upstream of and south of Paradise Cut.

The above modifications of the study area do not significantly change the overall focus of the feasibility study. The scope of the investigation would be expanded somewhat to include creeks, streams, and flood plains in the Stockton area, however, many of the flood plain areas are commingled with the main stem of the San Joaquin River. Traditional and non-traditional alternatives, considered for the Stockton area would be similar to those considered in the Section 905(b) Analysis. These alternatives were considered in the Reconnaissance Report for the Stockton 211 project.

Use of Available Information

Studies have been conducted and data have been collected by government agencies and other organizations concerning the water resource problems of the Lower San Joaquin River. Existing information will be used to the maximum extent possible and evaluated for data adequacy. The latest information will be incorporated into the study. The review effort will be used to determine whether the methods used, results obtained, and the uncertainties in the analyses are acceptable based on Corps policies and guidelines, and sound scientific practices.

Although several other efforts are ongoing, as mentioned above, the PDT determined that it would pursue an approach that utilized the best, currently available data. As this study and other studies complete analyses and reports, the information will be shared and inconsistencies will require some form of resolution. Resolution of inconsistencies will strongly influence the approach the PDT takes for completing the study.

CHAPTER 3 - MANAGEMENT OF FEASIBILITY STUDY

GENERAL

CESPK and the non-Federal sponsors will be responsible for management of the LSJRFS. Management of the study will be conducted at three basic levels: the Project Delivery Team (PDT), CESPK Project Review Boards and Executive Committee. The following is a description of each.

At the time of this revision, the non-Federal sponsor is SJAFCA. The State of California Department of Water Resources has indicated a willingness to join SJAFCA as a non-Federal sponsor but has been unable to do so thus far. Until that time, the State project managers will serve as PDT members and will be heavily involved in the study process. Additionally, the State has other ongoing efforts that may benefit this study. Such work and products will not be eligible for work in-kind until the State becomes a signatory to the FCSA. However, the State is willing to share these products thus reducing overall study costs.

Project Delivery Team

The PDT will include representatives from CESPK and the sponsor. This team will ensure appropriate scope of the studies, guide in their accomplishment, and develop and recommend potential solutions. CESPK participation on the team will include representatives from Programs and Project Management, Planning, Engineering, Real Estate, and other elements as appropriate. The sponsor will participate in study management and may also provide engineering and technical support as in-kind services. The team will provide recommendations to the Executive Committee on the tasks to be conducted and extent of planning and evaluation to be carried out in the feasibility phase. The team will also report to the Executive Committee on the results of studies and recommend alternative courses of action for study implementation.

PDT meetings will be held regularly throughout the feasibility phase. Meetings will be held at approximately 1-month intervals, but may be more frequent. Current PDT members are listed on Table 1.

Executive Committee

The Executive Committee will include the CESPK District Engineer (or designee), Planning Division Chief, Chief of Engineering Division, and Deputy District Engineer for Project Management. Each of the two non-Federal sponsors will provide one representative along with one primary technical advisor. Collectively, those representing the sponsors will be equal partners with the Corps representatives on the committee. The District Engineer and counterpart representing the sponsor organizations will assist in chairing the committee. The Executive Committee will manage the overall study by (1) maintaining a working knowledge of the feasibility study, (2) assisting in resolving emerging policy issues, (3) ensuring that evolving study results and policies are consistent and coordinated, (4) directing the PDT, and (5) ratifying decisions made by the PDT.

The Executive Committee will participate in Issue Resolution Conferences (IRCs) and is responsible for resolving any disputes that may arise during the study. The committee will agree on the solutions and study direction, which may include termination. At least one IRC will be held prior to the public distribution of the draft Feasibility Report to ensure that all issues are resolved

before the final report is submitted to higher authority. Additional IRCs will be held, as required, throughout the study to resolve any problems that may arise. Current Executive Committee members are identified on Table 2. An Executive Committee kick-off meeting has been scheduled for August 10, 2009.

Table 1. Project Delivery Team Members

USACE			
Kevin Richardson	Water Management Section (ED-DW)	L2L0650	916-557-7108
Mike Lin	Hydraulic Design Section (ED-DH)	L2L0640	-7409
John High	Chief, Hydrology Section	L2L0220	-7109
Tom Catarella	Civil Engr Design Section A	L2L0610	-7269
Wayne Smith	Soil Design (ED-GS) – Levee Stability	L2L0720	-5381
Bob Vrchoticky	Cost Engineering Section	L2L0820	-7336
Casey Young	GIS & Mapping Section	L2L0740	-7158
Jim Powers	Environmental Engineering Section	L2L0760	-7903
John Jordan	Economics, Water Resources Branch (PD)		-7267
Kurt Keilman	Chief, Economic Analysis Section	L2K060	-7836
Stacey Samuelson	Water Resources Planner(PD)	L2K0450	-6931
Scott Miner	Ecosystem Restoration Specialist (PD)	L2K0400	-6695
Matt Davis	Environmental Planning Section (PD)	L2K0500	-6708
Dan Artho	Environmental Coordinator	L2K0510	-7723
Brian Luke	Ast Environmental Coordinator	L2K0510	-6629
Jeremy Hollis	Acquisition & Management Branch, Real Estate (RE-B)	L2N0600	-6880
Lisa Clay	Office of Counsel (OC)		-5295
Ofelia Sarmiento	Budget Analyst, Civil Programs Section (PM-C)	L2H0220	-7586
Carmen Routh	P2 Program Specialist, Programs Support & P2 (PM-P)	L2H0210	-7633
Mike Morgan	Civil Works Branch, PPMD (PM-C)	L2H0410	-6716
CVFPB			
Michael Sabbaghian	Acting PM, Project Development Branch		**(916) 574-1243**
SJAFCA			
Jim Giottonini	Executive Director		(209) 937-8339
Roger Churchwell	Director of Engineering		(209) 937-8866
Ken Myers	Technical Consultant		(916) 853-5371
Robin Mooney	Technical Consultant		(408) 829-1944
Dave Peterson	Technical Consultant		(916) 608-2212

Table 2. Executive Committee Members

Organization	Name/Title	Address	Phone
Corps of Engineers CESPK-DE	Tom Chapman, Colonel District Engineer	1325 J Street Sacramento, CA 95814	(916) 557-7490
Corps of Engineers CESPK-PM	Deputy District Engineer for Project Management	1325 J Street Sacramento, CA 95814	(916) 557-7490
Corps of Engineers CESPK-PD	Francis Piccola Chief, Planning Division	1325 J Street Sacramento, CA 95814	(916) 557-6735
Corps of Engineers CESPK-ED	Kevin Knuuti Chief, Engineering Division	1325 J Street Sacramento, CA 95814	(916) 557-7623
Central Valley Flood Protection Board,	Jay Punia, Executive Officer	3310 El Camino Ave, Sacramento, CA 95821	(916) 574-0609
DWR	Gary Bardini Chief, Division of Flood Management	3310 El Camino Ave, Sacramento, CA 95821	(916) 574-2612
SJAFCA	Jim Giottonini, Executive Director	22 E Weber Ave. Stockton, CA 95202	(209) 937-8339
	Roger Churchwell, Director of Engineering	22 E Weber Ave. Stockton, CA 95202	(209) 937-8866

MANAGEMENT DOCUMENTS

During the feasibility study, CESPK will prepare a series of reports and other information documents useful in the overall management of the study. These documents will be available to the sponsor and will serve as the record of study progress. The documents are described below.

Justification Sheet

The CESPK budget analyst and the Corps Project Manager prepare the justification sheet twice a year. It summarizes the study status, expenditures to date, and Federal budget requirements for the following year. This document is sent by the Corps to Congress to support the President's annual budget request. After the President's budget is released for the fiscal year, the justification sheet can be released to the sponsors.

Monthly Status Report

The Corps Project Manager will update the status report monthly with assistance from PDT members. This report will also document all important dates and milestones, meetings, task completions, and expenditures for Federal and non-Federal funds as compared to budgets.

Funds Management Report

The budget analyst will update the funds management report monthly and distribute copies to the Corps Project Manager. This report documents budgets and expenditures for each task, resource, and budget type (hired labor, contracts, miscellaneous expenses, and others) for

the current Federal fiscal year. At the end of each government fiscal year, a final funds management report is issued showing the total budgets, expenditures, and obligations for the fiscal year. The year-end report will be sent to the sponsors.

Schedule and Cost Change Request

A schedule and cost change request (SACCR) is the principal form that will be used to change the approved study cost or major study milestones. The Corps and sponsors representatives on the PDT will review and agree to changes proposed by the SACCR before subsequent action by the appropriate level of approval in accordance with ER 5-7-1.

Scopes of Work

The SOW is the basic means of assigning work tasks during the feasibility study. A SOW will be issued for each work task described in this PMP. Each SOW will describe the scope and schedule for the task, as well as the funds provided to complete the task. The Project Manager will distribute study funding using the SOW system. The SOW will be based on the scopes of work negotiated with CESPK technical elements or the sponsors, and, once signed, will replace the SOW ‘s filed at the signing of the FCSA.

For work in-credit efforts, the non-Federal sponsor will submit, in writing, scopes of work for review by the PDT. The PDT has thirty days to review these scopes. A letter in draft format will be provided to the non-Federal sponsor indicating the PDT’s determination. Following review of the letter by the non-Federal sponsor, the District will finalize the letter and provide to the sponsor. Preapproval of work in-kind scopes demonstrates the work in-kind efforts are consistent with the study. Preapproval does not guarantee credit. The sponsor must submit documentation of the work performed in order to receive credit. Additionally, credit will only be afforded for actual costs, not estimates.

CHAPTER 4 - FEASIBILITY STUDY PRODUCTS

GENERAL

The integrated comprehensive feasibility study will result in several study and construction project products. The primary study products are described below.

Feasibility Report and EIS/EIR

These products include all activities leading to the approval of the final Feasibility report and NEPA/CEQA Report (Feasibility Report and EIS/EIR) by HQUSACE. It entails all problem identification and formulation activities required to identify and recommend one or more alternatives. The Feasibility Report is the final version of the milestone conference documentation, which will be continually refined throughout the planning process. It also includes coordination of the study and results with all interested parties; District technical review; review by CESPD and HQUSACE; and ultimately transmittal to Congress.

These products include all activities leading to report approval by HQUSACE. They include NEPA, CEQA, and other environmental compliance documentation. They also include coordination of the study and results with all interested parties; District technical review; review by CESPD and HQUSACE; and ultimately transmittal of the report to Congress.

Letter of Intent and Statement of Financial Capability

As the details of the recommended plan are finalized, coordination will be undertaken with the local non-Federal sponsors to review the requirements of local cooperation. Letters of intent that acknowledge the requirements of local cooperation and express a good faith intent to provide those items for the recommended plan will be developed. Additionally, Self Certifications of Financial Capability will be developed by the sponsors to meet their obligations under the PPA for construction of the recommended plan.

Design Agreement

Per the Model Agreement for Design dated April 12, 2006, the sponsor initially contributes only 25 percent of the costs for design during the design phase of the project. These design costs are then included in total project costs in a PCA for construction of the project and payments made by a non-Federal interest under the Design Agreement are credited towards the non-Federal share of total project costs where they are ultimately cost shared in the same percentage as the purpose of the project in accordance with Section 105(c) of WRDA 86.

Other Supporting Plans

Other supporting plans will be developed as needed as the study progresses to address specific items such as local cooperation, real estate acquisition, quality control, environmental and cultural matters, safety and security, and O&M.

TECHNICAL REQUIREMENTS

The work tasks and products described in this PMP are at a feasibility level of effort. The scope of studies in terms of content and level of detail for the evaluation phase are defined and required by, but not limited to, the following documents:

DM 1165-2-501	Surveying and Mapping	Dec 1999
EC 11-1-114	Value Management (VM)/Value Engineering (VE)	3 Feb 2003
EC 1105-2-404	Planning Civil Works Project Under the Environmental Operating Principles	1 May 2003
EC 1105-2-405	Division Engineers Submittal of Final Decision Document for Projects Requiring Specific Authorization	31 Mar 2005
EC 1105-2-406	District Engineers Presentation of Final Decision Document for Projects Requiring Specific Authorization	31 Mar 2005
EC 1105-2-407	Planning Models Improvement Program: Model Certification	31 May 2005
EC 1105-2-408	Peer Review of Decision Documents	31 May 2005
EC 1105-2-409	Planning in a Collaborative Environment	31 May 2005
EC 1105-2-410	Review of Decision Documents	22 Aug 2008
EM 1110-2-1411	Standard Project Flood Determination (ENG BUL 52-8)	01 Mar 1965
EM 1110-2-1413	Hydrologic Analysis of Interior Areas	15 Jan 1987
EM 1110-2-1415	Hydrologic Frequency Analysis	05 Mar 1993
EM 1110-2-1416	River Hydraulics	15 Oct 1993
EM 1110-2-1417	Flood Runoff Analysis	31 Aug 1994
EM 1110-2-1419	Hydrologic Engineering Requirements of Flood Damage Reduction Studies	31 Jan 1995
EM 1110-2-1420	Hydrologic Engineering Requirements of Reservoirs	31 Oct 1997
EM 1110-2-1602	Hydraulic Design of Reservoir Outlet Works	15 Oct 1980
EM 1110-2-1603	Hydraulic Design of Spillways	16 Jan 1990
EM 1110-2-3600	Management of Water Control Systems	30 Nov 1987
ER 5-1-11	Programs and Project Management	17 Aug 2001

ER 200-2-2	Procedures for Implementing NEPA	4 Mar 1988
ER 405-1-12 (Ch. 12)	Real Estate Handbook - Local Cooperation	1 May 1998
ER 1105-2-100	Planning Guidance Notebook	22 Apr 2000
ER 1110-1-12	Quality Management	1 Jun 1993
ER 1110-2-1150	Engineering and Design for Civil Works Projects	31 Aug 1999
ER 1110-2-1302	Engineering and Design, Civil Works Cost Engineering	31 Mar 1994
ER 1110-2-8154	Water Quality and Environmental Management for Corps Civil Works Projects	31 May 1995
ER 1130-2-530	Project Operations, Flood Control Operations, & Maintenance Policies	30 Oct 2002
ER 1130-2-540	Environmental Stewardship, Operations & Maintenance Policies	Nov 1996, Nov 2002
ER 1130-2-550	Recreation Operations & Maintenance Policies	Nov 1996, Nov 2002
ER 1165-2-29	General Credit for Flood Control	18 Nov 1987
ER 1165-2-119	Modifications to Completed Projects	20 Sep 1982
ER 1165-2-131	Local Cooperation Agreement for New Starts	15 Apr 1989
ER 1165-2-132	Hazardous, Toxic, and Radioactive Waste (HTRW) Guidance for Civil Works Projects	26 Jun 1992
ER 1165-2-206	Delegation of Review, Approval, and Signature Authority for Project Cooperation Agreements for Specifically Authorized Projects	30 Jan 2004
ER 1165-2-400	Recreational Planning, Development, and Management Policies	9 Aug 1985
ER 1165-2-501	Water Resources Policies and Authorities, Civil Works Ecosystem Restoration Policy	30 Sep 1999
ER 1165-2-205	Delegation of Review and Approval Authority for Post-Authorization Decision Documents	31 Mar 2004
ETL 1110-2-556	Risk-Based Analysis in Geotechnical Engineering for the Support of Planning Studies	May 1999
U.S. Water Resources Council	Economic and Environmental Principles and Guidelines Council Publication for Water and Related Land Resources Implementation Studies	10 Mar 1983

CESPD-R-1110-1-8	CESPD Quality Management Plan	Sep 2004
CESPK-01-B	Sacramento District Quality Management Plan Appendix B, DQCP for Planning	Mar 2004

CHAPTER 5 - STUDY COST ESTIMATE AND TASKS

STUDY COST AND CONTINGENCY

Estimated costs to accomplish the Feasibility Study costs are required to be shared between the Corps and the non-Federal sponsors on a 50-50 basis. Section 225 of the Water Resources Development Act of 2000 changed the cost-sharing requirements so that the non-Federal sponsors may now provide the entire share of feasibility study costs as in-kind services. The non-Federal sponsors would provide in-kind work as described in the individual study tasks in this chapter. In revising this PMP, both scope and cost were reevaluated. This reevaluation has resulted in an increase of $729,300 to the study costs. The current total estimated study cost is **$11,338,150**. Table 3 shows a summary of the feasibility study cost by task and the separation of the costs between the Corps and sponsor. It also shows the adjustment of costs to make up the required 50-50 share. Table 4 shows the estimated costs separated by Federal fiscal year. It is important to note that the actual cost estimate may change, subject to the iterative nature of the planning process.

A study contingency is assigned to cover unforeseen study requirements and uncertainties in the study cost estimate. These may have resulted from the limited information available during the development of the PMP. A ten percent contingency will be added to the overall study cost estimate to cover unexpected additional costs such as modified alternatives and/or more extensive analysis of alternatives. Approval from the Executive Committee is required before these contingency funds can be used in the feasibility study.

DETAILED DESCRIPTION OF STUDY TASKS

This section describes the tasks to be accomplished during the feasibility study phase. These descriptions are based on the evaluation, investigation, and alternatives analysis during the feasibility phase to assess the problems, opportunities, and potential solutions for the Lower San Joaquin River. The scope and cost of these tasks are subject to change during the feasibility study as more information becomes available. This revision includes specific activities that will be performed in Fiscal Year 2010.

At the beginning of each task, either CESPK or the sponsors may review any planned in-kind work or contract of the other for adequacy. At the conclusion of each task, either CESPK or the sponsors may review and approve the results of the work before it is considered complete. Review and assessment of the adequacy of the task will be the responsibility of the PDT and its technical staff.

Risk and uncertainty analysis will be part of the analysis for hydrology and hydraulics, geotechnical, and economics evaluations. Seismicity will also be evaluated as part of this feasibility study.

As the study progresses, certain resource and funding constraints may affect how this study continues. As these constraints are encountered, the PDT will prepare a recommended path forward which may differ than what is included in this PMP. In that event, the PMP will be revised to reflect that change.

Table 3. Feasibility Study Cost Summary by Organization ($1000)

Task	Federal			Sponsors			Total
	Labor & Other	Contract	Subtotal	Labor & Other	Contract	Subtotal	
Project Management, P2, and BA	256		256	400		400	656
P2 Scheduling	52.5		52.5			0	52.5
Budget Analyst (BA)	36.4		36.4			0	36.4
Plan Formulation, Evaluation, & Coordination	1,628		1,628			0	1,628
Public Involvement, Coordination, & Outreach	20		20	68		68	88
Environmental Studies & Report	500	400	900	30		30	930
Historical/Cultural Resources Studies, Coord. & Report	45		45			0	45
Fish & Wildlife Services Coordination Act Report	0	100	100			0	100
GIS Mapping and Graphics	95.2		95.2	142.8		142.8	238
Vertical Datum Conversion to NAVD 88	116		116			0	116
Hydrology & Hydraulics Studies and Reports			0			0	0
Hydrology Studies, Reservoir Ops Study & Report	982.56		982.56	230.64		230.64	1,213.2
Hydraulic Analysis & Report	625		625	625		625	1,250
Hydraulic data collection and mapping	55.6		55.6	500.4		500.4	556
Engineering Design Analysis and Report; Design Sections A & B	575		575	385		385	960
AE Negotiations Section - scope, estimate, get contract out the door, pay bills, and evaluate at the tail end	50		50			0	50
Engineering Technology and Specifications Section - quality management and specs prep	25		25			0	25
Geotechnical Studies & Report	212.1	132	344	60		60	404.1
Geology Study & Report	50.97		50.97	118.93		118.93	169.9
Real Estates Studies & Documents	498		498			0	498
Economic Studies & Report	500		500			0	500
Cost Estimating & Report	102.56		102.56	25.64		25.64	128.2
HTRW Assessment & Report	82.2		82.2			0	82.2
Feasibility Report Documentation & Process	200		200			0	200
Legal Review	60		60			0	60
Sponsor's Technical Review	0		0	50		50	50
Agency Technical Review (ATR)	138		138			0	138
Independent External Peer Review (IEPR)*	See below		0			0	0
Washington Level Review (addressing comments, Chief's Report, etc)	40		40	40		40	80
Value Engineering	60		60			0	60
Subtotal	7,006.09	**632**	**7,638.09**			**2,578.41**	10,216.5

Contingency (10%)	763.809	257.841	1,021.65
Subtotal	8,401.899	2,836.251	**11,238.15**
Additional Non-Federal Cash Required	-2,782.824	+-2,782.824	
Independent External Peer Review (IEPR)*	+100	0	**100**
Total Cost Share for Entire Study	5,719.075	5,619.075	**11,338.15**

***IEPR is not cost shared with the sponsor, it is a 100 percent Federal cost**

Programs and Project Management, (Includes Scheduling and Budgeting)

The Program and Project Management Division of CESPK will accomplish this task with assistance by the sponsor. The task primarily includes project management. It also includes preparation of monthly reports, budget documents, contract coordination, pre-construction engineering and design cost-sharing agreement, PMP, final audit, and sponsor letter of intent. These tasks are described below.

1. Project Management: CESPK will perform this task with support from the sponsors. Project management tasks will involve day-to-day management of the execution of the feasibility study. This will include monitoring the schedule and budget, setting the agenda for and conducting project management team meetings, coordinating with and writing SOS to CESPK technical elements, writing miscellaneous correspondence, and preparing monthly status reports and other documents as required. Similar requirements will be necessary for upward reporting by the sponsor. The project manager will be the primary point of contact for the non-Federal sponsor and is responsible for the overall execution of the feasibility study. The Corps Project Manager will coordinate with other team members and the sponsors, attend other meetings as appropriate, monitor study execution and expenditures, and update the Sacramento District PRB of study progress.

2. Project and Programs Management Documentation: A number of project related documents will be required as part of accomplishing of the feasibility study. They primarily include:

- **Monthly Reports Preparation:** CESPK will update the periodic reports listed in Chapter 3 under “Management Documents.” The monthly reports will include the Project Executive Summary Report, justification sheet, and SACCRs.

- **Budget Documents and Financial Reports:** CESPK will prepare monthly Funds Management Reports and other budget documents for use by the study management team. This task will require coordination with the study manager to explain expenditures and develop spending schedules. The sponsors will coordinate with CESPK to keep the Corps apprised of the sponsor's spending performance.

- **PED Agreement:** CESPK with input from the sponsors will prepare outlines of the cost-sharing obligations for the PED phase. The draft agreement will be submitted with the draft Feasibility Report. The draft PED agreement will be revised based on comments received at the Feasibility Review Conference (FRC). The revised PED agreement will be submitted to the District PRB for approval. This task will require close coordination between the CESPK Project manager and the sponsors.

- **Project Management Plan:** The Project Manager will coordinate this task with input from all CESPK elements and the sponsors. The PMP will be revised, specifying work roles and responsibilities regarding design, construction, and operation and maintenance

of the plan. The PMP will include the tasks, schedules, costs and management framework, and direction for the PDT from the completion of the feasibility study through construction.

- **Final Audit Preparation:** CESPK will prepare a final audit to ensure that local contributions are at their proper level and settle any debts or credits.

- **Sponsors Letters of Intent:** The sponsors will review their rights and responsibilities during the PED and Construction phases, and prepare a letter expressing intent to cost share the cost of design and construction of the selected plan, and to operate and maintain the completed project. In the letter, the sponsors will express their understanding of cost-sharing responsibilities regarding design, construction, and operation and maintenance. The program manager will assist the sponsors in this task by providing examples and explaining the role and responsibilities of the non-Federal sponsors.

Responsible Sacramento District Element:	
Programs and Project Management Division, Civil Works	
Cost	
Sacramento District:	344,900
Sponsor In-Kind Contribution:	400,000
Current Total Estimated Cost:	744,900

Plan Formulation, Evaluation, and Coordination

The Planning Division, Water Resources Branch of CESPK will be responsible for this task. A planning team will be assembled whose task will be coordination, development and oversight of the feasibility study and associated documentation; agency technical review (ATR); and District quality control (DQC) to ensure compliance with Corps planning procedures and policy, in cooperation with the Project Manager, other PDT elements, sponsors, and ATR team. This will include ongoing coordination, meetings, correspondence, and coordinating NEPA public involvement activities with Environmental Planning Branch, sponsors, contractors/ consultants, stakeholders, elected officials, cooperating agencies, and the public (organizations, groups, and individuals). The planning team will support, facilitate, and expedite processing documents with the DST and RIT, consistent with CESPD's Milestone System, through the Chief of Engineers Report and Record of Decision. Major responsibilities of the planning team include:

- Planning efforts focused on study purposes of flood risk management and ecosystem restoration.
- Accomplishment of planning tasks in accordance with the Federal planning process.

- Participation in public involvement and agency coordination.
- Review pertinent available information and collection of new information.
- Formulate, refine, evaluate, and compare alternatives.
- Prepare and process feasibility conference and scoping information.
- Prepare for and facilitate feasibility milestone conferences.
- Prepare preliminary, draft and final feasibility reports and supporting documentation.
- Prepare and process Study Review Plan through the PDT, PCX, and DST.
- Support DQC, ATR, and Independent External Peer Review and Value Engineering responsibilities.
- Support Washington-level review activities

Specific responsibilities of the planning team towards the above activities are covered in other sections of this Chapter. Tasks specific to the plan formulation function by the planning team include the following:

1. Planning Studies Coordination and Contract Management (F1 thru F9): The planning team will develop, coordinate, and execute the planning program for the feasibility study, related resource requirements (PMP, Review Plan, schedule, and budget), and documentation in coordination with the PM, PDT, sponsors, and others. The planning team will also provide expert guidance, advice, and leadership on technical planning requirements and policies. The planning team will ensure that the Federal/Corps iterative planning process is effectively executed and documented. The planning team will participate in meetings in coordination with the PM, other PDT elements, ATR, sponsors, contractors, concerned agencies, stakeholders, the public, officials, Corps echelons, and others. The team will communicate and correspond as needed, as well as advise and support Corps and/or sponsors' contract managers and points of contact with execution of the work. The planning team will ensure compliance with pertinent planning regulations, policies, guidance, and quality management plans and practices. The team will prepare for, and participate in site visits, meetings, correspondence, and other actions as needed. The planning team will review, revise, and support the PMP and PMP updates; schedules; SOSs; pertinent technical studies, reports, data, and other products and publications; news articles; meeting presentations and summaries; and contract SOWs and modifications.

2. Plan Formulation: The planning team will be responsible for all phases of formulation and evaluation of alternative plans leading to development of a selected plan for the LSJRFS.

- **Identify Problems, Needs, and Study Objectives and Constraints** – The planning team will review the Comprehensive Study, SJAFCA Project, and other pertinent studies, reports, and available information, coordinate with other Federal and non-Federal interests, and perform appropriate investigation and analysis to define baseline planning conditions. This will include definition of the future without-project condition in the study area, identity and describe resources problems and needs, prepare a set of specific study objectives to address the problems and needs, and develop planning criteria specific to the primary study area that will guide the plan formulation process.

- **Resources Management Measures and Initial Alternatives for F3 Conference** – The planning team will identify all appropriate and practical resources management measures that could address the study objectives. The team will screen these measures and prepare a set of initial alternatives to address the study objectives. Using available information, the planning team will compare and evaluate the initial alternatives to identity which could be considered for further development. These initial alternatives and other developed information will be assembled in documentation for use at the F3 Conference (F3 Conference Documentation).

- **Continue Refinements and Evaluate Alternatives for F4 Conference:** Based on guidance from the F3 meeting, input from non-Federal sponsors, and input from public involvement, the planning team will refine and screen management measures and initial alternatives, as well as assess the feasibility of each measure to reduce flood damages and improve the ecosystem within the primary study area in relation to the evaluation criteria. The planning team will review and revise problem and opportunity statements, inventories and forecasts of resources, and existing and future without-project conditions. The team will refine the planning objectives, constraints, and evaluation criteria for management measures (features and actions) and alternatives. The team will refine the management measures based on ongoing hydrologic and hydraulic evaluation along the Lower San Joaquin River, tributaries, and distributaries. The team will also refine and reformulate alternatives, and provide narrative descriptions and illustrations for each plan to be considered in detail. The PDT planning team will closely coordinate with other PDT elements to develop more detailed cost estimates, assess environmental effects and costs to mitigate effects, and then identify and quantify benefits of alternatives. The planning team will evaluate and compare alternatives based on the evaluation criteria, costs, and benefits using Corps' system of accounts. This will include (1) assessing and evaluating potential effects of each alternative; (2) comparing effects of all alternatives; (3) ranking alternatives; (4) identifying the recommended plan based on evaluation criteria, highest net benefits, and environmental protection; and (5) describing rationale for selecting the recommended plan. Alternatives and other developed information will be assembled in report like format and for use at the F4 Conference (F4 Conference Documentation). Task also includes National Ecosystem Restoration (NER) Plan development, CE/ICA to support determination of "best buy" plans, NER plan, possible Combined Plan (NED/NER) and LEDPA.

- **Continue Plan Formulation and Evaluation, and Focus on Recommended Plan and AFB Policy Issues (F4A):** Based on guidance from the F4 conference and input from the non-Federal sponsors and PDT, the planning team will further develop, refine, evaluate, and compare alternatives, and identify the NED plan from the NED analysis if required, the locally preferred plan (LPP), and the recommended plan. The team will identify preliminary cost allocations and develop cost-sharing responsibilities. The planning team will coordinate more detailed cost estimates, assess environmental effects and costs to mitigate those effects, and then refine and quantify benefits of alternatives. The planning team will compare plans and effects, including cost-effectiveness and incremental cost analysis, identify the recommended plan, and provide rationale. The team will identify known technical and/or policy issues and recommend actions to resolve

these issues (describe issue, background, options, and assessment, and recommend action).

- **Continue Plan Formulation for Feasibility Report and EIR/EIS (F5):** Based on the PGM from the AFB and input from non-Federal sponsors and PDT, the planning team will revise or revisit the plan formulation for the draft Feasibility Report and EIS/EIR (see "Feasibility Report Documentation and Process'). The team will coordinate the PDT to refine details of the recommended plan, cost allocation, and cost-sharing responsibilities; organize appendixes; and refine cost estimates and assessments of environmental effects and costs to mitigate for effects. The planning team will refine benefits and costs of the alternatives and the comparison of effects. The team will recommend the best plan based on evaluation criteria, highest net benefits, and environmental protection, and then identify the recommended plan and rationale.

3. Coordinate and Accomplish Feasibility Phase Review Conferences: The planning team will coordinate and accomplish along with the Project Manager, sponsors, and other PDT elements at least three plan formulation review conferences.

- **Prepare and Process Pre-Conference Documentation, and Convene Feasibility Study Scoping Meeting (F3) and Alternative Review (F4) Conferences:** The planning team will coordinate, prepare, and process a pre-conference document (write, edit, organize, format, prepare graphics and appendixes, reproduce, and distribute). The team will advise, review, and comment on preliminary/interim draft versions with the PDT and ATR. The planning team will support and cooperate in ATR of the pre-conference document, and then revise the pre-conference document based on comments/responses from the ATR. The planning team will certify and copy the F3 and F4 documents, and distribute them to conference participants. The planning team will prepare for and conduct the feasibility scoping meeting (F3) and alternative review (F4) conferences in coordination with PDT, ATR, DST, and RIT. The team, along with the Project Managers, will discuss technical and/or policy issues and recommend actions to resolve the issues, and coordinate with the DST and RIT on preparation of the post-conference Project Guidance Memorandum.

  The F3 conference will mark the development of the feasibility study scope, without-project conditions, and the proposed array of measures. The PDT will present the evaluation of the proposed measures, and the ATR will summarize the initial results.

  The F4 conference will mark the completion of the evaluations of the final array of alternatives and prepare for the alternative formulation briefing (CESPD Milestone F4A) to be held with HQUSACE. The PDT will present the evaluation of the final array of alternatives that will be presented in the Feasibility Study. The ATR leader will summarize the results of the ATR and the resolution of issues. These issues will normally involve the formulation, design, and detailed evaluation of the with-project conditions for the final array of alternatives.

  The study cost-sharing sponsors will summarize the views of the agency and identify any

issues that must be resolved prior to the selection of a locally preferred plan. Federal interest will be reviewed. This conference will reach a consensus that the evaluations are adequate to select a recommended plan (locally preferred plan and NED and/or NER plan). Participants in the conference will also identify and discuss policy issues that will be of concern at the AFB and develop a list of the issues for consideration at the AFB.

- **Prepare and Process Pre-Conference Documentation, and Convene Alternatives Formulation Briefing (F4A):** The planning team, in conjunction with the rest of the PDT, will prepare for and conduct the AFB conference. The team will discuss technical and/or policy issues and recommend actions to resolve these issues.

- **Prepare for and Participate in Feasibility Review Conference (F7)** *(Note: Conference may be waived if no significant issues exist)*: The planning team will prepare for and conduct the FRC to discuss issues with the draft Feasibility Report and recommended actions. The team will then resolve technical and/or policy issues and recommend actions to resolve these issues. The team will coordinate preparation of the post-FRC policy guidance

Responsible Sacramento District Element:	
Planning Division, Water Resources Branch	
Cost:	
Sacramento District:	1,628,000
Current Total Estimated Cost:	1,628,000

Public Involvement, Coordination, and Outreach

The Planning Division of CESPK consisting of both Water Resources Branch and Environmental Planning Branch (NEPA/CEQA) will be responsible for leading this task in coordination with SPK Public Affairs Office. However, efforts will be conducted jointly by CESPK and the sponsors. This task will consist primarily of coordinating the study scope, results, and solutions internally and externally with the public; conducting public meetings and workshops; and responding to public inquiries. Detailed task descriptions follow.

1. Communication Plan: The PDT, including sponsors primarily through contracting services, will develop and execute a communication plan (plan) as part of the PMP in accord with current Corps policy to effectively reach the affected community. The plan will result in development of key messages; promote a work climate that is open, informed, and actively engaged in listening and being responsive; build effective relationships; and integrate strategic communications into the study business process. A draft template for the Communication Plan is included in Appendix C. The plan will be developed jointly by the planning team and local sponsors.

CESPK (Planning Division – Water Resources and Environmental Planning Branches) and the sponsors will prepare and disseminate required public notices in accordance with NEPA, CEQA, and other pertinent laws and policy. These notices include the Notice of Intent (NOI) and Notice Of Preparation (NOP) to prepare the draft and final Feasibility Report and EIS and EIR, respectively, notices of availability of draft and final reports, notices of completion, determination, and record of decision. CESPK, with input from the sponsors, will prepare, review, process, and release the public notices. CESPK with input from the sponsors will develop and maintain a mailing list for the notices.

Included in this task is preparation of public review responses to comments on study products. CESPK will jointly perform this task with input from the sponsors. Environmental Analysis Section will administer the required comment period and incorporate responses to public comments into the EIS/EIR, as appropriate. CESPK and the sponsors will be responsible for addressing, processing, and drafting responses to comments.

2. Public Meeting(s): CESPK will update the mailing list and prepare the public meeting invitation with input from the sponsors. The invitation will include a summary of the draft Feasibility Report and EIS/EIR, a description of alternatives, and meeting information. CESPK will print and distribute the invitation. The purpose of the public meeting is to provide an opportunity for public comment on the draft Feasibility Report and EIS/EIR. CESPK, with input from the sponsors, will plan and set the agenda for the meeting/workshop, develop and deliver the presentations, set up and staff a sign-in table, and provide audio-visual equipment and other materials. The sponsors will provide a facility for the meeting, along with other requested logistical materials and supplies, and perform recording duties. CESPK, with input from the sponsors, will organize and conduct the meeting and prepare any visual displays. CESPK, with input from the sponsors, will prepare a memorandum documenting the meeting.

The PDT planning team including the sponsors will prepare for and participate in public meetings and workshops **(F2)**, board meetings, in-progress and executive meetings, as well as prepare related correspondence and products. The team will support preparation and execution of a public involvement plan and process. (Workshops will be held during formulation and evaluation as appropriate.) The team will also review and comment on summary documentation for the public workshops and process.

Along with the rest of the PDT, the planning team will prepare for and hold a public meeting to receive comments on the adequacy of the draft Feasibility Report and EIS/EIR and merits of alternatives approximately 30 days after release of the draft Feasibility Report and EIS/EIR. The team will coordinate with the sponsor and key stakeholders on required filing of documents with EPA and meeting announcements, plus a strategy for and management of comments received.

The planning team will coordinate with CESPD and prepare the supporting documentation as needed for publication of the public notice that the final Feasibility Report and EIR/EIS is available for public consideration (draft notice and mailing list). After the date of issue of the Public Notice, forward Report and EIS/EIR to HQUSACE, and file the final Report w/EPA.

3. Workshops: CESPK and local sponsor shall develop various levels and kinds of workshops

for the PDT and study partners as needed to support planning efforts during the plan formulation process.

Responsible Sacramento District Element:		
	Planning Division, Water Resources Branch (only)	
Cost		
	Sacramento District:	$20,000
□	Sponsor In-Kind Contribution:	$68,000
□	**Current Total Estimated Cost:**	**$88,000**

Environmental Studies and Report

This Planning Division of CESPK will be responsible for this task. The Environmental Resources Branch of CESPK with assistance of the sponsor will participate as a member of the PDT and prepare and present briefings; update SOS and budget estimates as required; participate in the preparation of the Real Estate Supplement and the feasibility of construction designs; participate in assembling the study PDT and ATR teams; assist in completing the ATR process, public/interagency review, and preparation of required documents. This involves attending PDT meetings as required. Work will include all environmental analyses including the Habitat Evaluation Procedure (HEP). Existing scientific and technical data will be used when available and where information is not available, new scientific and technical research will be undertaken as necessary to ensure that the appropriate data is available to support restoration opportunities identified during the feasibility study. Environmental Planning Section of Environmental Resources Branch will be the responsible CESPK element for these tasks.

1. Public Scoping Activities: As mentioned in the previous task (Public Involvement), the planning team with support of the sponsors will prepare and distribute the NOI and NOP to address the requirements of NEPA and CEQA, respectively. This also includes preparation and maintenance of a study mailing list for notice of public workshop. In addition, this task includes preparation of an Environmental Scoping Report (ESR) based on the results of the scoping process. The ESR is to include a list comments received on the NOI and NOP and other information proved at the initial public meeting and responses to those comments. It also includes assessing the responses along with recommended actions for inclusion into the feasibility study process. The ESR is to be made available to interested agencies and individuals

2. Plan Formulation Participation: CESPK along with support by the sponsors will perform this task. It includes participating in developing alternatives, evaluation, and comparison of alternatives, including cost-effectiveness and incremental cost analysis, general coordination with other elements; attend study team meetings; and provide advice on environmental aspects

of alternatives. It is estimated that for the LSJRFS, along with flood damage reduction, alternatives will include a focus on ecosystem restoration, or combined plan requiring trade-off analysis; as well as the possibility for incorporating recreational opportunities. Accordingly, this task includes support in formulating and evaluating plans for these purposes. Task includes assisting in the NER Plan development, CE/ICA to support determination of "best buy" plans, NER plan, possible combined plan, and LEDPA.

3. Environmental Analysis: This task will be accomplished primarily by CESPK. It includes identification of effects, restoration benefits, and potential mitigation features of alternative plans. Several, but not all, tasks include:

- **Participate in HEP Team:** The team will consist of one representative from the DFG, NMFS, DWR, Corps, and FWS. The FWS will have the lead on the HEP team and prepare the HEP report. All team members must be certified. The work will include attending meetings, mapping fieldwork to assess habitats, choosing indicator species, and identifying mitigation alternatives. The team will produce a HEP report that will document the results of the fieldwork and HEP analysis.

- **Biological Restoration Parameters**: To plan actions that will have a net restorative effect on listed species and habitats, information will be obtained on the following parameters:

    - factors which promote or discourage their success
    - pre-project conditions of these resources
    - high- value locations that should not be disturbed
    - the potential for restoration success under varying scenarios

    This task will use scientific evaluation methods that are acceptable and understandable to the general public to assess biological and ecological values. This will include using existing information and new data, as necessary, to identify baseline and future-without-project conditions for wetland and riparian habitat, water quality, fish, wildlife, and endangered species habitat, and other relevant environmental conditions.

- **ESA Coordination**: Complete the Section 7 process to satisfy the Endangered Species Act; consult with the USFWS and the NMFS under Section 7, and prepare a Biological Assessment. Additional ESA survey work may be required. To assess effects to listed fish species, it may be necessary to conduct the Standard Assessment Methodology (SAM). Assist local sponsors in meeting their obligations under the California Endangered Species Act by providing biological information.

- **Mitigation Plan Development:** Based on reported effects, develop rough estimates of required mitigation and mitigation costs for single-purpose flood damage reduction plans; develop a more detailed mitigation plan and costs for the NED based plan and recommended plan. The sponsors will select alternative mitigation sites for consideration, subject to approval by the Corps.

- **Wetland Delineation:** Delineate wetlands in study area for Section 404 requirements and State and local laws; determine effects of alternatives on wetlands and mitigation requirements. The task will include field surveys, mapping, and report preparation.

- **Air Quality:** Perform an air quality baseline assessment, determine effects of alternatives, and develop appropriate mitigation.

- **Water Quality:** Corps regulations require a Section 404(b)(1) analysis to determine the extent of water quality effects. The Section 404(b)(1) water quality effects analysis will be included in the environmental documentation. Identify and recommend LEDPA.

- **Social/Environmental Justice:** Evaluation of social impact and environmental justice with the selected plan(s).

4. Draft Feasibility Report and EIS/EIR Preparation: This task will be accomplished primarily by CESPK with support from the sponsors. It includes examining NEPA, CEQA, and other environmental related regulations; organize and format data; and describe alternatives, including construction durations and borrow and disposal areas based on information received from Civil Engineering Design Section. CESPK will assemble the EIS/EIR. Reproduction and distribution of reports is discussed under ”Feasibility Report Documentation and Process.”

5. Final EIS/EIR Preparation: This task will be accomplished primarily by CESPK with support from the sponsors. It includes the review of comments received on the Draft Feasibility Report and EIS/EIR, developing responses to those comments for inclusion into the Final Feasibility Report and EIS/EIR, and incorporate changes based on the responses into the final EIS/EIR. Reproduction and distribution of reports is discussed under ”Feasibility Report Documentation and Process.”

6. Record of Decision: The Corps’ Environmental Planning Section will prepare the draft Record of Decision (ROD). The draft ROD will then be submitted to South Pacific Division and HQUSACE.

Responsible Sacramento District Element:	
Planning Division, Environmental Planning Section	
Cost:	
Sacramento District:	400,000
A/E Contract:	400,000
Other Expense: ESA Surveys	100,000
Sponsor In-Kind Contribution:	30,000
Current Total Estimated Cost:	**930,000**

Historical/Cultural Resource Studies, Coordination, and Report

The Planning Division of CESPK will be responsible for this task. It primarily includes preparing a SOW for contracting services, supervising the contract, reviewing contract products, and coordinating with the State Historic Preservation Officer to assess historical and cultural resources issues associated with a potential project along the Lower San Joaquin River.

1. Cultural Resources and Effects: CESPK will determine the effects of the alternatives on any historical, architectural, archeological, and paleontological resources in the area of potential effect. A field survey to locate cultural sites, in accordance with the National Historic Preservation Act of 1966, may be necessary. Any sites discovered during the survey will be evaluated for the National Register of Historic Places.

2. Tribal Coordination: CESPK, along with the sponsors, will coordinate with local tribes as appropriate, on potential cultural sites within the study area.

3. Report and Coordination: A report will be prepared to document all survey results, outline significant past and present cultural resources, and describe the effects of each alternative on cultural resources. The report will also describe the range of additional future preservation, if required, and the associated costs. This report will be prepared and coordinated with the State Historic Preservation Officer.

Responsible Sacramento District Element:	
Planning Division, Environmental Analysis Section	
Cost	
Sacramento District:	45,000
Current Total Estimated Cost:	**45,000**

Fish and Wildlife Service Coordination Act Report

The Planning Division of CESPK will be responsible for this task which is to be performed by the USFWS and the NMFS. CESPK will write a SOW and transfer funds to the USFWS and the NMFS or contractor for biological surveys, HEP analysis, and draft and final Coordination Act Reports. The Corps' effort will also include monitoring USFWS and the NMFS work and providing USFWS and the NMFS with required information such as description of alternatives and map of affected area.

The USFWS and the NMFS efforts will include environmental data collection and evaluation of the environmental resources in the study area. The USFWS and the NMFS will review alternatives, assess the effect of alternatives on the environmental values of the study area, and help to identify restoration and mitigation measures. The USFWS and the NMFS will

provide guidance and recommendations concerning the formulation of flood damage reduction and ecosystem restoration alternatives. As part of this work, the USFWS and the NMFS will participate on the HEP team and prepare the HEP analysis report. The USFWS and the NMFS will prepare a draft and final Coordination Act Report documenting their findings. The draft and final CAR will be included as an appendix to the EIS/EIR.

Responsible Sacramento District Element:		
	Planning Division, Environmental Planning Section (POC) U.S. Fish and Wildlife Service, Corps Project Branch	
Cost:		
□	Other Expense:	100,000
□	**Current Total Estimated Cost:**	**100,000**

GIS, Mapping, and Graphics; Data Management Plan

The Engineering Division of CESPK will be responsibility for this task which will be accomplished primarily by the non-Federal sponsors with support from CESPK. This task includes developing channel cross-sections for hydrologic evaluations and mapping for floodplain delineation where feasible, and generation of maps and graphics for documents clarification, public workshops, and other presentations throughout the feasibility process. To the maximum extent possible information from the Comprehensive Study, DWR mapping efforts, and the SJAFCA Project will be used to define in-channel conditions along the Lower San Joaquin River and in the Stockton area. However, it is expected that modification of the channel topography by the sponsors will be needed to ensure that the resulting hydraulic evaluations (river hydrologic models and flood plain analysis) are representative of actual conditions. The North American Vertical Datum of 1988 (NAVD88) shall be used for all data gathered for this project.

GIS, Mapping, and Graphics; Data Management Plan

Geospatial Data Management Plan (See Appendix D)

The Geospatial Data Management Plan (GDP) integrates geospatial data management into the Project Management Business Process (PMBP) and facilitates the implementation of enterprise data management. This data collection and management plan covers Computer Aided Design and Drafting (CADD) and Geographic Information System (GIS) products. Implementation of this plan will allow project delivery teams (PDTs) comprised of experts from various districts to work collaboratively on a project. For this collaboration to become a reality, the U.S. Army Corps of Engineers (USACE) must follow established criteria, policy and guidance for the acquisition, processing, storage, distribution, and use of geospatial data. Project delivery team members

who are responsible for collecting spatial data and producing Computer Aided Design and Drafting (CADD) and Geographic Information System (GIS) products have a major role to play in the success of this effort.

Responsible Sacramento District Element:	
Engineering Division, GIS/Survey Section	
Cost	
Sacramento District:	95,200
Sponsor In-Kind Contribution:	142,800
Current Total Estimated Cost:	**238,000**

Vertical Datum Conversion to NAVD 1988

This project is required to be converted to vertical datum NAVD 1988. CA State DWR, in conjunction with NGS, has just started (August 2008) a project to update vertical control throughout the San Joaquin River region. Approximately 150 new height mod points (on NAVD88) will be established. These points can (in time) be utilized for primary NSRS control throughout the project area.

Uncertain if all stream gages in project area have updated references to NAD83 (NSRS 2007)/NAVD88—assumed not likely given no firm indication in CA reports and variety of agencies operating gages. Some DWR gages are referenced to both NGVD29 and NAVD88. This update may be in progress by some agencies, including SPK.

Navigation project depths (and levee heights?) along the river may also be referenced to "USED," a tidal MLLW-based reference plane. The origin and epoch of USED in the San Joaquin River could not be found—it is not certain that an independent tidal datum exists. It is presumed that the USED datum has not been referenced to the latest tidal epoch.

The relationships between the tidal USED and orthometric NAVD88/NGVD29 may not be totally modeled relative to levee protection elevations.

Responsible Sacramento District Element:	
Engineering Division, GIS/Survey Section	
Cost	
Sacramento District:	116,000
Sponsor In-Kind Contribution:	0
Current Total Estimated Cost:	**116,000**

Hydrology and Hydraulics Studies and Report

The Engineering Division of CESPK will be responsible for this task. CESPK along with support from the sponsors will accomplish hydrologic and hydraulic (H&H) studies, rainfall-runoff modeling, and related investigations. The conduct and results of the H&H studies will be documented in an Engineering Appendix to the Feasibility Report.

As originally planned and included in the first PMP, CESPK will be responsible for the main stem San Joaquin River and major tributaries and distributaries while the sponsors will be responsible for the Stockton area of the study area as show in the below table. However, the approach to the hydrologic and hydraulic effort for this study is being carefully evaluated to maximize efficiency and effectiveness and highly subject to change.

Corps' Study Watercourses	
Watercourse	**Length (miles)**
San Joaquin River	41.0
Stanislaus River	18.5
Paradise Cut	7.5
Old River	10.8
Middle River	13.4
Salmon Slough & Grant Line Canal	2.5
Burns Cutoff	3.7
French Camp Slough	6.4
North Fork South Littlejohns Creek	8.1
South Fork South Littlejohns Creek	4.2
Lone Tree Creek	3.0
Duck Creek	11.7
Port of Stockton	2.3
Subtotal	**133.1**
Local Sponsor's Watercourses	
Watercourse	**Length (miles)**
Lower Mormon Slough	6.3
Smith Canal	2.4
Diverting Canal & Upper Mormon Sl.	11.9
Potter A	1.3
Calaveras River	8.2
Fourteenmile Slough (West)	4.9
Fourteenmile Slough (South)	4.6
Fivemile Slough	3.1
Mosher Slough	8.6
Mosher Creek	2.7
Little Bear	0.9
Bear Creek	16.5
Pixley Slough	2.9
Telephone Cut	1.5
White Slough	4.8
Honker Cut	1.0
Disappointment Slough	6.2

Bishop Slough	3.0
Subtotal	**90.8**

The North American Vertical Datum of 1988 (NAVD88) shall be used for all data gathered for this project.

1. **Data Collection**: The DWR, in cooperation with CESPK, is in the process of updating hydrologic and hydraulic conditions relating to the existing Federal/State flood system in the Central Valley. However, it is not likely that meaningful information, especially revised floodplains, will be available from this process for the LSJRFS. Accordingly, the approach chosen is one of first reviewing hydrologic and hydraulic information generated from the Sacramento-San Joaquin River Comprehensive Study and from the SJAFCA Project and then supplementing this information as appropriate to develop information for completing the LSJRFS. Accordingly, this task first includes reviewing existing studies, acquiring field information as appropriate for hydrologic, hydraulic, and sediment analyses, and then preparing appropriate analysis for detailed alternative formulation and evaluation mentioned below.

2. HEC-HMS Rainfall-Runoff and Reservoir Modeling: This subtask will include preparing hydrologic modeling of the study area as described below.

- **Developed Hypothetical Events:** Historical stream gage, rainfall, and snowmelt records will be assembled for applicable runoff basins that contribute runoff to the study area. These historical records will be used to develop frequency curves from which will be derived hypothetical rainfall and snowmelt events for the 10, 4, 2, 1, 0.5, 0.2 percent chance exceedence runoff events. Both HEC-ResSim and HEC-HMS models of these same basins will be assembled and calibrated using recorded data for selected historical events. These calibrated models will then be used to generate runoff from the previously mentioned hypothetical hydrologic event for routing downstream through the study area for without-project and alternatives analyses. Additional hypothetical events may be needed during the evaluation of both the flood damage reduction and ecosystem restoration alternatives. The selected plan may be optimized to safely pass a hypothetical event that has not yet been developed. In this case, additional hypothetical floods will be needed for final design. These floods will be developed using the calibrated HEC-ResSim and HEC-HMS models. More frequent floods and flow-duration curves may also be needed for ecosystem restoration analysis.

- **Model Hypothetical Runoff Events:** Hypothetical runoff hydrographs will be developed from hypothetical rainfall, snowmelt, and the calibrated HEC-HMS models, with basin parameters adjusted as appropriate to the event. Event concurrences will also be analyzed.

3. Hydraulic Modeling: This subtask will consist of development or revision of existing hydraulic models. Specific models have been mentioned in existing documentation, including FLO-2D, HEC-RAS, and HEC-2. Both unsteady and steady analyses will be used in the plan formulation and alternative screening. Several models have already been developed and will only need to be updated with current information. However, along various water courses in the

study area such as in the Stockton area, tributary streams, and distributaries to the Delta including the potential for a bypass at or near Paradise Cut, it is expected that new models or major revisions of existing models will be required1. Alternative analysis will involve two major steps. The first step will involve a less detailed screening process that will assist in determining the optimum measures that will then be considered further. The second step will involve a more detailed analysis and optimization of the selected measures.

4. **Floodplain Delineation**: Updated flood plains will be delineation by CESPK for the main stem San Joaquin River and major tributaries and distributaries and the sponsors for the Stockton, Lathrop, and Manteca areas. The delineation will be modeled using HEC-RAS for the channel reaches, and FLO-2D models will be used for the over bank/overland flow reaches. Hydrographs will be input at the selected index points. Flows at provided index point(s) in the floodplain will be obtained and will be used in the risk-based analysis. Results from the model will be used to locate overflow points along the channel and to provide flow-stage relations for use in the FLO-2D model. FLO-2D will be used to delineate floodplains in the over bank areas and beyond immediate channel areas. The 10, 4, 2, 1, 0.5, and 0.2 percent exceedence events will be used in the alternative analysis. Additional floods may also be simulated if needed in the final design optimization. Clearly defined flood plain maps will be developed for these frequency events.

The hydraulic model(s) will be modified to include hydraulic uncertainties and then run for the above events. Uncertainty data will include potential effects of sedimentation, debris, and n-values variances. Rating curves will be developed at the provided index point(s) along the channel for existing and with-project conditions. The rating curves will include the uncertainty results and will be used as input into the risk-based model.

5. Alternative Simulations: Measures and alternatives will be evaluated independently by CESPK and sponsors to assess their potential effect on the existing flood plain. Base evaluation plans will be performed for each measure and alternative, if applicable. The products expected from the evaluation are as follows:

- Flood Hydrographs – With-project condition hydrographs will be run through the hydraulic models for the 10, 4, 2, 1, 0.5, and 0.2 percent exceedence events. Reservoir alternatives will require with-project condition hydrographs to be developed from the hypothetical HEC-ResSim and HEC-HMS runoff hydrographs developed in step 2 above. These hydrographs will be used in the analysis of alternatives, such as sizing potential reservoirs, levee design, and other engineering analysis. Any alternatives requiring construction of new reservoirs will require the assembly of new HEC-ResSim model(s) to evaluate reservoir sizing, elevation-storage relations, and outlet and spillway configurations. Alternatives requiring re-operation of existing reservoirs will require the existing HEC-ResSim model(s) to be modified and run with the new operation criteria. The HEC-HMS models developed in step 2 above will be modified to include storage-elevation, outlet works, and spillway rating curve data when analyzing smaller detention basin alternatives. Dry year, wet year, and approximate average year basin runoff conditions will be simulated as part of the reservoir analysis. This data will be used in the

1 In general, all of the existing hydraulic models were constructed using the NGVD vertical datum of 1929.

risk analysis.

- Water-surface profiles – Run/HEC-RAS for six exceedence events. The model will be run for the expected hydraulic conditions for the without-project and proposed measures. The models will require that levee failure information be included in the models. The impacts of sea-level rise over a fifty year project life will also be included in the modeling. Water surface profiles will be developed from these runs. The minimum, maximum, and most likely basin conditions will be simulated as part of the reservoir analysis. This data will be used in the risk analysis.

- Risk-based data – The hydraulic model(s) will be modified to include hydraulic uncertainties and then run for the above events. Uncertainty data will include potential effects of sedimentation, debris, and n-values variances. Rating curves will be developed at the provided index point(s) along the channel for existing and with-project conditions. The rating curves will include the uncertainty results and will be input into the risk-based model. Development of the rating curves will assume levee overtopping without-failure for the river system upstream and downstream of the index point of concern. At each index point, the rating curves will assume levee failure into the corresponding damage area(s).

- Channel stability analysis – A channel stability analysis will be performed for the effect of the proposed measures (both flood damage reduction and ecosystem restoration) on the channels.

- Interior drainage – Project-induced impacts to interior drainage will be identified and mitigation will be developed and included in the recommended plan. Additional needed evaluations and expected products are indicated for each of the alternative descriptions.

6. Hydraulic Designs: This task will consist of defining hydraulic designs features for use in the facilities designs. The resulting designs will be considered in overall engineering designs discussed below. CESPK will be responsible for design along the San Joaquin River, major tributaries, and distributaries, and the sponsors will be responsible for hydraulic designs in the Stockton area. The designs will follow the Corps applicable requirements related to risk-based analysis.

7. **Hydrologic and Hydraulic Appendices***:* Separate technical hydrology and hydraulics appendices will be prepared conforming to ER 1110-2-1150, Engineering and Design for Civil Works Projects, dated 31 August 1999. The appendices will present a description of the data used, methods, assumptions, and results, and will be prepared as an appendix to an overall study report.

- Analytical methods – Methods of analysis, supporting reasons for adopting selected methods, and associated relationships to features selection will be discussed. Model development, calibration, verification, and application will be presented in detail. Computer programs used in the study will be described.

- Modeling applications – The report will present the hydrodynamic characteristics of each flow conveyance feature, including channel velocities, flow distributions, and water surface profiles or contours as determined from the modeling efforts. Significance of all modeling assumptions will be discussed in sufficient detail to address operation and maintenance and other future conditions.

- Uncertainties – A discussion of uncertainties will be included in the report, as well as how those uncertainties relate to feature development or operation and maintenance issues. The uncertainty discussion will also relate to the potential for more detailed analysis as details of alternatives are developed.

- Results and interpretations – The report will not only present hydrologic and hydrodynamic details of the modeling effort, but also a full engineering interpretation of those results. This interpretation will include descriptions of performance and function of the system for the full range of possible scenarios.

- Format – The format of the report will conform to ER 1110-2-1150, Engineering and Design for Civil Works Projects, dated 31 August 1999.

Responsible Sacramento District Element:		
	Engineering Division, Hydraulic Design and Water Management Sections	
Cost		
	Sacramento District:	1,663,160
□	Sponsors In-Kind Contribution:	1,356,040
□	**Current Total Estimated Cost:**	**3,019,200**

Engineering Design Analysis and Report; Design Sections A & B

The Engineering Division of CESPK will be responsible for this task. The CESPK along with support from the sponsor will accomplish engineering analysis to prepare designs of alternatives considered and assembling this information into an Engineering Appendix to the Feasibility Report. CESPK will be responsible for engineering designs along the main stem San Joaquin River and major tributaries and distributaries while the sponsor will be responsible for engineering designs for the Stockton, Lathrop, and Manteca areas of the study area.

1. Technical Engineering: The Hydraulic Design Section will provide the Engineering Technical Manager (ETM) or Lead Designer. The ETM will coordinate, help plan, and lead all Engineering Division activities, ensure that work performed by the PDT and sponsor is appropriate for the feasibility study, provide answers to questions regarding engineering aspects of the study, prepare responses to comments received during review of the draft Feasibility

Report, and provide input to the PMP. This overall management task will be ongoing throughout the study and will be in accordance with ER 1110-2-1150, as amended by CECW-EP memorandum, 31 August 1999, subject: Engineering, Design, and Dam Safety Guidance. This also includes coordination with other technical elements of Engineering Division in order to determine the location and configuration of the various structural features.

2. Designs – This subtask consists of preparing engineering designs by the Project Delivery Team (PDT) for alternatives considered in the feasibility investigation.

· Preliminary Designs: Comparative studies, field investigations, design, and screening-level cost estimates will be in sufficient detail to substantiate the recommended plan and the estimate. The level of design will be consistent with the engineering plan in the PMP. The Engineering Appendix will discuss the selection of the project area and evaluation of alternative layouts, alignments, components, esthetics, and relocation of facilities, and will describe the components and features, including the improvements required on lands to enable the proper disposal of dredged or excavated material. This work will entail preparing civil drawings or plates using data collected by other disciplines and developing digital terrain models for site layout of new levee templates and cross sections, provide site layouts for ecosystem restoration, compute quantities, and identification of haul routes, construction scheduling, OMRR&R requirements and cost estimates. The Engineering Appendix will contain the results of studies and analysis performed by Hydrology, Hydraulic, Geotechnical, Civil disciplines. Mapping of the work area and borrow sources used will be supplied by the sponsor.

· Civil Design A will develop and describe the engineering requirements relating to site layout, the determination of lands, easements, right-of-ways, and borrow and disposal sites are necessary for the construction, operation, and maintenance of the alternatives. Prepare preliminary design drawings depicting engineering requirements for use by Engineering and Real Estate in jointly determining land requirements. In addition, Civil Design A will identify proposed relocations and the related land requirements. Relocation work will consist of data searches of records, private and public utility records, and site visits. Civil Design A will assist in scheduling and diversion/dewatering schemes including over-winter protection planning. Most civil design work typically follows the work of other disciplines. Work expected to be completed prior to civil design beginning are surveying, creating appropriate 3-dimensional electronic topography, and hydrologic and hydraulic investigations. If available, DTM's will be developed for layout of project features for computing quantities of the selected plan. Quantities for alternative screened will be developed using other means.

· Civil Design B will be responsible for developing the ecosystem restoration design in consultation with other PDT members using rough grading plans and alignments developed by Civil Des A and Hydraulic Design Sections. Effort has been estimated assuming that 20 percent of the work area is suitable for restoration.

Designs and Quantities:

3. Engineering Appendix: This task includes development of a draft and final Engineering Appendix to be attached to the feasibility report. Final deliverable products will be detailed in individual SOW. The CESPK with assistance from the sponsor will develop the draft basis of design and Engineering Appendix based on public, agency, CESPD, and HQUSACE comments.

The final basis of design and Engineering Appendix will be included as part of the final feasibility report. Included in the Basis of Design Appendix will be an estimate of the construction schedule. This will be developed for implementation of the recommended plan. The schedule will include the sequence of land acquisition, design, and construction operations, and will incorporate construction window constraints based on the Endangered Species Act, California Endangered Species Act, and other requirements. The type of equipment used during construction, timing and duration of equipment use, duration of overall construction period, and the affected construction area will be estimated for use in evaluating environmental effects.

Responsible Sacramento District Element:	
Engineering Division, Civil Engineering Design Section	
Cost:	
Sacramento District:	**575,000**
Sponsor In-Kind Contribution:	**385,000**
Current Total Estimated Cost:	**960,000**

Geotechnical Studies and Report

The Engineering Division of CESPK will be responsible for insuring this task is completed according to Federal guidelines. The Task will be accomplished by the CESPK with support from local sponsor. The geotechnical studies and report will be used for the feasibility and economic evaluation of alternatives. Particular emphasis will be placed on the discovery of any detrimental subsurface elements that may make a particular alternative unattractive. The study work will be performed in two phases, that is, a primary phase and a final phase. The final phase will include feasibility-level geotechnical exploration and report data.

1. **Preliminary Phase Geotechnical Analysis -** This includes development of baseline geology and soils data. This task includes review of existing geological information and existing field investigation information of existing and with-project features, concept designs for proposed work, and investigation of potential borrow sites. Particular information will come from data from the existing levee. This information will address:

- Review Existing geotechnical data provided by the Corps, SAJFCA, DWR, review available geomorphologic data, and past history of levee during flood events.
- Analyze existing conditions, review previous geotechnical analyses, and perform additional geotechnical analyses as needed to assess the existing conditions of the

levee.
- Assess the impact on the existing levee integrity of the utility penetrations, encroachments, and vegetation on the levee slopes.
- Assess the seismic conditions of the existing levee.
- Review, revise and/or perform risk analyses for the existing conditions based on the Corps criteria considering existing geotechnical data, both existing and being developed for other activities related to the flood SAFE California Program.
- Prepare a summary geotechnical report of the existing conditions summarizing all existing geotechnical and geomorphologic data, with the results of all geotechnical evaluation of the existing levee including seepage, under-seepage, stability, erosion, past history, seismic evaluation, and risk analysis. ,

2. Final Phase Geotechnical Analysis. - This includes additional field explorations for the final one or two alternatives and of the proposed borrow areas. The final phase will include also the results of the geotechnical analyses of the proposed alternatives in the formulation plan (seepage, under-seepage, stability analyses), investigation of the potential borrow areas, seismic evaluation of the proposed alternatives. This phase will include the following:,

- Additional subsurface investigation of the existing levee. The subsurface investigation will consist of additional borings drilled at the existing levee crest, waterside of the levee, at the levee landside toe and at some distance from the landside toe and along the proposed realigned levee as proposed by the alternatives of the formulation plan, as needed to characterize the subsurface conditions of the proposed alternatives. The proposed exploration plan will be coordinated with the cultural resources specialists, and environmental specialists. The subsurface investigation will include also in-situ and laboratory testing.
- Investigation of the potential borrow areas.
- Geotechnical analysis of the proposed alternatives, including seepage, under-seepage, stability analyses.
- Evaluation of the seismic conditions of the proposed alternatives of the formulation plan.
- Perform risk analyses for the proposed alternatives based on the Corps criteria considering the additional geotechnical data, including that developed for the floodSAFE California Program
- Prepare a geotechnical report of the subsurface conditions summarizing all existing and new geotechnical and the geomorphologic data, including the results of all geotechnical evaluation of the proposed alternatives including seepage, under-seepage, stability, erosion, past history, seismic evaluation, and risk analysis.

3. Geotechnical Reports- Geotechnical reports will be prepared to document all information developed, analyses, and results as part of the final geotechnical studies for the existing conditions and for the proposed alternatives. Included in this feasibility report will be:

- Summary of all existing and new field exploration laboratory test data.
- Seismic evaluation of the existing conditions and proposed alternatives including liquefaction analyses of the foundation soils.

- Results of the stability, seepage and under-seepage evaluations of the existing conditions and proposed alternatives. Seepage and stability evaluations will be determined using groundwater modeling system (GMS) and UTEXAS 4 computer modeling.
- Design of the levee embankment of the proposed alternatives considering all geotechnical analyses.
- Basic requirements for the materials to be used in the construction of the levee embankment for the proposed alternatives.
- Characterization of the borrow material including material types and construction requirements.
- Geotechnical synopsis including the effects of the final one or two alternatives.
- Report will be included in the Engineering Basis of Design Appendix and will include all pertinent plates and figures.

4. **Technical Guidance Documents:** The following guidance documents will be used in the geotechnical analyses:

- Geotechnical Levee Practice SOP EDG-03, dated 7July 2004.
- EM 1110-2-1913 Design and Construction of Levees (2000),
- WES TM 3-424 (1956)
- EM 1110-1-1804 Geotechnical Investigation (2001)
- EM 1110-1-1906 Soil Sampling
- EM 1110-2-1619 Risk Based Analysis for Flood Damage Reduction Studies (1996)
- ER 1110-1-8100 Laboratory Investigations and Testing (1997)
- ETL 1110-2-556 – Risk-Based Analysis in Geotechnical Engineering for Support of Planning Studies (1999)
- ETL 1110-2-561 – Reliability Analysis and Risk Assessment for Seepage and Slope Stability Failure Modes for Embankment Dams (2006)
- ETL 1110-2-569 – Engineering and Design – Design Guidance for Levee Under seepage (2005)

Responsible Sacramento District Element:	
Engineering Division, Geotechnical Branch	
Cost	
Sacramento District:	212,100
A/E Contract:	132,000
Sponsors In-Kind Contribution:	60,000
Current Total Estimated Cost:	**404,100**

Geology Studies and Report

The Engineering Division of CESPK will be responsible for insuring this task is completed according to Federal guidelines. The study work will be performed in two phases, that is, a primary phase and a final phase. The final phase will include feasibility-level geotechnical exploration and report data. Sponsor (CVFPB through CA Department of Water Resources) will also have a significant role in this task. Sponsor will conduct investigations and perform analyses to characterize surface and subsurface geology of the study area. This information will stem from DWR's ongoing evaluation of urban and non-urban project levees, as well as the urban non-project levees in the study area.

Preliminary Phase Geotechnical Analysis - This includes development of baseline geology and soils data. This task includes review of existing geological information and existing field investigation information of existing and with-project features, and assist in the investigation of potential borrow sites. Particular information will come from data from the existing levee. This information will address:

Description of Work and Services: The primary work effort for this task includes the following:

- **Review of geological and geotechnical data:** Review data from available previous geotechnical investigations.

- **Set-up and manage subsurface investigation contract.** Set up and manage subsurface investigation contract to collect data to supplement data as noted in the geotechnical design alternatives.

- **Additional subsurface investigation of the existing levee**. The subsurface investigation will consist of additional borings drilled as needed at the existing levee crest, waterside of the levee, at the levee landside toe, at some distance from the landside toe, and along the proposed realigned levee as proposed by the alternatives of the formulation plan, as needed to characterize the subsurface conditions of the proposed alternatives. The proposed exploration plan will be coordinated with the cultural resources specialists, and environmental specialists.

- **Investigations of the potential borrow areas.** The subsurface investigation will also include drilling and/or test pit excavations of potential borrow sites. Laboratory tests will be performed to evaluate materials suitability for levee embankment construction.

- **Geological/Geotechnical Report.** A geological/geotechnical report will be prepared describing all pertinent information from the geologic review and subsurface investigation including but not limited to:

    1. Summary of the subsurface investigation.
    2. Soil test boring and test pit logs
    3. Geologic maps of the investigation site
    4. Groundwater levels noted during drilling.

5. Work schedule and dates for investigation.
6. All unusual occurrences noted during the investigation

- **Technical Guidance Documents:** The following guidance documents will be used in the subsurface investigation:

- Geotechnical Levee Practice SOP EDG-03, dated 7July 2004.
- EM 1110-2-1913 Design and Construction of Levees (2000),
- EM 1110-1-1804 Geotechnical Investigation (2001)
- EM 1110-1-1906 Soil Sampling.
- ASTM D-1587 Standard Practices for Thin-Walled Tube Sampling of Soils (1983)
- ASTM D-2487 Standard Practices for Classification of Soils for Engineering Purposes (Unified Soil Classification System) (2000)
- ASTM D-2488 Standard Practices for Description and Identification of Soils (Visual-Manual Procedures) (2000)

Responsible Sacramento District Element:		
	Engineering Division, Geology Section	
Cost		
	Sacramento District:	50,970
□	Sponsors In-Kind Contribution:	118,930
□	**Current Total Estimated Cost:**	**169,900**

Real Estate Studies and Documents

The Real Estate Division of CESPK will be responsible for this task. CESPK will complete this task with input from the sponsors. Work includes coordination, preparation of the Real Estate Supplement, review and revision of report documents, preparation of gross appraisal, preparation of real estate map, physical taking analysis, preliminary attorney's opinion of compensability, rights of entry, cost estimates, real estate input to PMP, institutional financial capability analysis, and technical input.

1. Real Estate Coordination and Evaluations: This subtask includes all the coordination and evaluations required to complete Real Estate effort for the feasibility study. Major work efforts include:

- **Real Estate Coordination:** Includes, but is not limited to, CESPK-RE participation in team meetings, negotiation of work requirements, coordination with other offices on study data needed for Real Estate's major study products, and monitoring of progress and findings associated with Real Estate study products.

- **Gross Appraisal:** This work will include preparation of a detailed estimate of all real estate costs associated with acquisition of the real property requirements (see ER 405-1-12, Chapter 12, Section III, Appraisals, paragraph 12-12b, and Real Estate Policy Guidance Letter Number 3, Guidance for Preparation of Gross Appraisals.).

- **Baseline Real Estate Cost Estimate:** This work includes accounting for the plan's total estimated real estate cost in Code of Accounts format as required by EC 1110-2-528 under Feature Codes 01, Lands and Damages. This estimate of total real estate cost should include estimated costs for all Federal and non-Federal sponsors activities necessary for completion of the plan.

- **Preliminary Real Estate Acquisition Maps Preparation:** Determine tract ownership and acreage. Prepare real estate preliminary take line drawings.

- **Physical Takings Analysis:** Analytical task to evaluate if the plan development hydraulically affects property by taking or diminishing property or rights for the public's use by modifying the frequency, depth, or duration of water upon the property.

- **Preliminary Attorney's Opinion of Compensability:** Investigation and attorney's determination, if owners of facility's or utility's affected by the plan have a vested interest and compensable interest in the property, with regard to the real estate taking. If so, the obligation or liability of the Federal Government is the cost of providing substitute facilities or utilities, if necessary, for existing publicly owned roads and utilities, as well as existing privately owned railroads and utilities.

- **Rights of Entry:** CESPK will coordinate requests and work with the sponsors to obtain rights-of-entry for the survey, HTRW, cultural resources, and geotechnical exploration work required. Rights-of-entry must be obtained before testing can be done on privately owned property.

2. Report Preparation: This subtask includes completion of real estate documentation for the feasibility study. Major work efforts include:

- **Preparation of Real Estate Supplement:** This work includes preparation of the Real Estate Supplement, which is an overall plan describing the minimum real estate requirements (see ER 405-1-12, Chapter 12).

- **Review and Revision of Report Documents:** Includes all CESPK-RE activities involved in reviewing the feasibility report and responding to CESPD comments.

Responsible Sacramento District Element:

	Real Estate Division	
Cost		
	Sacramento District:	498,000
	Current Total Estimated Cost:	**498,000**

Economic Studies and Report

The Planning Division of CESPK will be responsible for this task. This task will be primarily accomplished by CESPK with assistance by the sponsors. It includes developing and documenting the economic feasibility of potential alternatives and the selected plan for the LSJRFS.

1. Planning Studies Coordination: This subtask includes coordinating the economic evaluation portion of the planning program for the feasibility study related to resource requirements (PMP, schedule, and budget) and coordination with the Corps project manager, PDT, sponsors, consultants/contractors, stakeholders, and others. The economists will attend and participate in meetings in coordination with the Corps project manager, PDT, sponsors, concerned agencies, stakeholders, public, officials, ATRT, and others. Communication and correspondence will be accomplished as needed. The economists will ensure compliance with pertinent planning regulations, policies, guidance, and quality management plans and practices, and will attend site visits as necessary. It also includes review and comment on PMP and PMP updates, schedules, SOSs, pertinent technical studies, reports, data, publications, news articles, meeting summaries, contracts, SOWs, and related products. Review and comment on reports prepared by sponsors, consultants, and contractors.

2. Plan Formulation and Evaluation Related to Economic Considerations: The existing and likely future without-project conditions will be identified and described along with the problems (flood damage) and opportunities to solve the problems. More specifically, the economists will work with the hydraulic design engineers to generate flood plains for the various flood frequencies; define effect areas on the latest flood plain maps; determine the depths and durations of flooding and structural improvement values for the flood events; create inventories and databases of residential, commercial, public property, and agriculture with the effect areas for each flood frequency; compute emergency and recovery costs and benefits; social impacts; and conduct agricultural damage assessment economics. Work will involve sorting and analyzing GIS parcel data for the flood plains. Risk and uncertainty analysis for structure-related categories will be conducted for all alternatives.

Data will be collected to calculate automobile damages, road damages, and emergency costs for each of the alternatives. Agricultural damages will be assessed for each alternative bases on the various flood events, duration of inundation, the probable time of the year or season in which the flood event occurs. Moreover, the agriculture damages will be only assessed for impact areas with significant agriculture production. The HEC-FDA program will be setup and

run to compute the expected annual damages and benefits for each of the alternatives. Study investigation will be limited to the study area delineated in the F3 document. The investigation of economic effects may be expanded to surrounding areas as alternatives are formulated. The economic assessment will not include economic effects on water quality, water supply, or stability of levees. The economists will identify any known technical and/or policy issues and recommend actions to resolve these issues. The above work will begin once necessary hydrologic and hydraulic information is available.

3. Report Preparation: This work includes preparing a draft and final economic appendix to the feasibility report related to economic considerations identified by the PDT. Ensure that responses by the PDT address all ATR comments to resolve issues. Prepare draft economics appendix including all phases of the economic analysis to the feasibility study. This work also includes preparing section(s) of the main feasibility report related to economic analysis and conclusions. Following review of the draft feasibility report, this work includes developing responses to comments on the draft appendix and report, and incorporating those comments into the final appendix and report.

Responsible Sacramento District Element:	
Planning Division, Water Resources Branch	
Cost	
Sacramento District:	500,000
Current Total Estimated Cost:	**500,000**

Cost Estimates and Report

The Engineering Division of CESPK will be responsible for this task. The Corps' Cost Engineering Section will prepare preliminary costs estimates for alternatives and feasibility-level baseline cost estimates of the selected plan. These estimates will be the total cost (Federal and non-Federal) of implementing the plan. Sponsor will perform cost estimates for relocations of roads, bridges and utilities for alternatives and feasibility-level baseline cost estimates of the selected plan. In addition sponsor will assist in the development of cost estimates for operation, maintenance, repair, replacement, and rehabilitation (OMRR&R) for alternatives and selected plan. Construction costs will be developed using MII (MCACES, Second Generation). Detailed total project cost and annual costs for the recommended alternative will be developed and presented in a spreadsheet format (Microsoft Excel). Detailed task descriptions are provided below.

1. Alternatives Costs: Using information from this study, other projects, and investigations in the area, the Corps will develop preliminary cost estimates (code of accounts format) for all features for alternatives considered.

2. Draft M-CACES Cost Estimate: CESPK will develop construction cost estimates, construction schedules, total project cost (TPC) and cost risk analysis relative to project execution. A baseline cost estimate (BCE) for the selected alternative will be developed using MII. Summary reports (Excel spreadsheets) will be developed identifying total project cost (Federal and non-Federal) for implementing the recommended alternative, including construction costs, LERRDS, mitigation, engineering and design, and construction management. The detailed first and annual costs will include OMRR&R, interest during construction, etc. The estimates will be developed for the recommended alternative in accordance with UFC 3-700-02A, "Construction Cost Estimates", 01 March 2005, and ER 1110-2-1302, "Civil Works Cost Engineering", 15 September 2008. The OMRR&R will be consistent with ER 1110-2-1150, "Engineering and Design for Civil Works Projects", 31 August 1999. A narrative basis of the estimate will be prepared and included in the draft Engineering Appendix to the draft Feasibility Report, along with the draft summary of total project cost and annual costs and the draft MII construction cost estimate. A formal cost risk analysis is required and will be developed using Crystal Ball software.

3. Final M-CACES Cost Estimate: CESPK will finalize the M-CACES cost estimates based on comments received on the draft report.

Responsible Sacramento District Element:	
Engineering Division, Cost Engineering Branch	
Cost	
Sacramento District:	102,560
Sponsors In-Kind Contribution:	25,640
Current Total Estimated Cost:	**128,200**

HTRW/MMRP Assessment and Report

The Engineering Division of CESPK will be responsible for this task. The purpose of this task is to assess issues or potential concerns associated with hazardous, toxic, radiological waste (HTRW) and Munitions and Explosives of Concern (MEC) that may be located in the plan's boundaries or may affect or be affected by alternatives considered in the LSJRFS. The analysis will be completed in accordance with HTRW Guidance for Civil Works Projects, ER 1165-2-132, June 92 and the requirements of OPORD 2006-43 for MEC.

1. Description of Work and Services: The primary work effort for this task includes the following:

- **Review of Agency Record Search Report:** Agency database record search of the HTRW study area may be conducted by a commercial vendor. A search of the USACE database for Formerly Used Defense Sites (FUDS) with known or suspected MEC will be

conducted. The record search report will be attached to the draft and final reports as an appendix. Review will include any available historical aerial photos and historical topographic maps.

- **Site Reconnaissance and Site Inspection:** After review of the regulatory agencies database, the study area where accessible by a car will be visited by the Geotechnical & Environmental Engineering Branch personnel for site Inspection. Any potential HTRW or MEC sites will be photographed, and spatial horizontal data of those areas will be collected using NAD 83, State Plane III, in feet. Any vertical data collected shall use the NAVD88 datum.

2. HTRW/MMRP Documentation: On the basis of the above record search and site reconnaissance are completed, draft and final documentation will be completed describing significant findings in the regulatory agencies database, sites visited, sites surveyed, and areas of concern. A final report will be prepared based on comments on the draft document. The final report will include all required revisions. The HTRW document will include:

- o Agency database search report
- o Summary of findings of regulatory agencies database
- o Summary of field inspection and areas of concern
- o Maps of sites visited
- o Photographs

Responsible Sacramento District Element:	
Engineering Division, Geotechnical & Environmental Engineering Branch	
Cost	
Sacramento District:	82,200
Current Total Estimated Cost:	**82,200**

Feasibility Report Documentation and Process

The Planning Division of CESPK will be responsible for this task. The planning team, along with other CESPK and sponsors support, will prepare a series of documents leading to completion of the feasibility report and EIS/EIR for the LSJRFS. These documents include the following:

1. Prepare Pre-AFB Document and Convene AFB (F4A): The planning team will prepare, reproduce, and distribute the pre-AFB document, along with the Project Study Issue Checklist, the study schedule, prior project guidance memorandums with their corresponding compliance memorandums and other status and issue papers for HQUSACE review. The team will advise, review, and coordinate with the PDT, ATR, CESPD, and HQUSACE on the pre-

meeting materials and arrangements. The planning team, along with the Project Manager, will coordinate with CESPD and HQUSACE to prepare the PGM and any follow-up actions.

2. Prepare and Process Draft Feasibility Report and EIS/EIR (F5): The planning team will prepare a draft Feasibility Report and EIS/EIR, which will include writing, formatting, preparing graphics, preparing appendixes, and reproducing and distributing the document to the ATRT, CESPD, HQUSACE, and others. The team will support and cooperate in the ATR and revision of draft Feasibility Report and EIS/EIR. The team will revise the draft Feasibility Report and EIS/EIR based on comments/responses from the ATR. In conjunction with the PDT, the planning team will back-check, certify, and copy the draft Feasibility Report and EIS/EIR, and distribute them to CESPD, HQUSACE, EPA, State Clearinghouse, and the public. Submittal to CESPD will include the Project Study Issue Checklist, the study schedule, peer review certification, prior project guidance memorandums with their corresponding compliance memorandums and other status and issue papers for HQUSACE review. The planning team will coordinate the preparation and processing of the public notices (notice of availability, notice of completion, and transmittal letter to the *Federal Register*) and file the documents with the EPA. The planning team will direct the PDT responses to HQ USACE's policy compliance review comments, as well as coordinate the PDT efforts during 45-day public review and comment period.

3. Prepare and Process Final Feasibility Report and EIS/EIR (F8): The planning team will respond to review comments (public agencies and the public) on the draft Feasibility Report and EIS/EIR, incorporate responses into the final Feasibility Report and EIS/EIR, and refine the recommended plan and documents if needed. The team will prepare the final Feasibility Report and EIS/EIR based on policy compliance review comments from the FRC, input from the non-Federal sponsor, agency review, and the PDT. The team will finalize the cost allocation and cost-sharing responsibilities; detailed benefits and cost estimates (M-CACES); assess environmental effects; identify mitigation commitments; and refine the NED analysis and recommended plans. The team will support and cooperate in the ATRT review and revision of the final Feasibility Report and EIS/EIR. The team will revise the final Feasibility Report and EIS/EIR based on comments/responses from the ATR; back check, certify, and copy the final Feasibility Report and EIS/EIR, and send it to CESPD. The submittal to CESPD will include, among other items required by ER 1105-2-100, Appendix H, the Project Study Issue Checklist, certification of peer review, Report Summary, PGM Compliance Memorandum, Draft Report of the Chief of Engineers, project maps and briefing slides.

4. Prepare and Process PMP for PED Phase: The planning team will coordinate with the PDT to prepare, copy, and distribute the draft PMP for ATRT review. The team will coordinate, revise, copy, and distribute the final PMP to the sponsors and CESPD.

Responsible Sacramento District Element:	
Planning Division, Water Resources Branch	
Cost:	
Sacramento District:	200,000

□	**Current Total Estimated Cost:**	**200,000**

Legal Review

The legal review will be conducted by the Corps and sponsors legal counsels to ensure that the documents meet legal requirements throughout the study.

Responsible Sacramento District Element:		
	Legal Counsel (Corps & Non-Federal Sponsor)	
Cost:		
	Sacramento District:	60,000
□	**Current Total Estimated Cost:**	**60,000**

Sponsor's Technical Review

The non-Federal sponsors will conduct their own reviews at each of the major study milestones primarily to ensure that technical errors during the early phases are not carried forward into later phases of analysis. The sponsors' review will be conducted for the F3 document and F4, F4A (AFB), draft and final Feasibility Reports and EIS/EIR documents. The sponsor's review comments will be forwarded to the planning technical lead and Corps project manager for incorporation or rebuttal.

Responsible Element:		
	Sponsors' Technical Review Team	
Cost:		
	Sacramento District:	N/A
□	Sponsors In-Kind Contribution:	50,000
□	**Current Total Estimated Cost:**	**50,000**

Agency Technical Review (ATR)

The ATR will be conducted at each of the major study milestones primarily to ensure that technical errors during the early phases are not carried forward into later phases of analysis. The ATR will be conducted for the F3 document and F4, F4A (AFB), draft and final Feasibility Reports and EIS/EIR documents. The ATR will be conducted by experts in their various fields, and the review will ensure that quality control will be maintained throughout the study.

Responsible Sacramento District Element:	
ATR Team (Corps)	
Cost:	
Sacramento District:	138,000
Current Total Estimated Cost:	**138,000**

Independent External Peer Review

Independent External Peer Review (IEPR) will be required for this study pursuant to Section 2034 of the Water Resources Development Act of 2007 as clarified by the recent EC 1105-2-410 (22 Aug 08). Section 2034 provides that costs for IEPR shall be a Federal expense and shall not exceed $500,000.

Responsible Sacramento District Element:	
Independent External Peer Review Team (Corps)	
Cost:	
Other Agency:	100,000
Current Total Estimated Cost:	**100,000**

Washington Level Review

This task will be the responsibility of CESPK with support by the sponsors. CESPK will perform this work with input from the sponsor as required. This task involves supporting the processing of the Feasibility Report through the Washington-level review process. This includes coordination with HQUSACE and CESPD to address Washington-level review comments on the Feasibility Report and EIS/EIR, revise or amend the final report and supporting documentation as needed; and then copy and distribute the correspondence as needed. This task will also include both Corps and sponsor preparation and participation in the Civil Works Review Board Meeting held at the Corps Headquarters. The PDT will support the development of the Chief of Engineer's Report, ASA (CW) Record of Decision, and pertinent documentation and correspondence. The amount of work required from CESPK and the sponsors during the Washington-level review is determined by the number and nature of the review comments and cannot be predetermined; therefore, this work item is considered a contingency.

Responsible Sacramento District Element:
Project Delivery Team (Corps)
Cost:

	Sacramento District:	40,000
□	Sponsors In-Kind Contribution:	40,000
□	**Current Total Estimated Cost:**	**80,000**

Value Engineering

The goal of Value Engineering (VE) during the feasibility study is to ensure that the widest range of feasible and cost efficient measures from an engineering standpoint are considered and that alternatives formulated from those measures are not limited to those that first came to mind at the initiation of the study. The VE officer will perform the value engineering study, which will take place prior to the F4 conference and will last about 4 days. The VE officer will identify known technical and policy issues and recommend actions to resolve the issues. The results of the VE study will be presented in the Feasibility Report and integrated into the discussion of the formulation of alternatives.

Responsible Sacramento District Element:		
	Value Engineering Team (Corps)	
Cost:		
	Sacramento District:	60,000
□	**Current Total Estimated Cost:**	**60,000**

Contingency

A 10 percent contingency has been added to the total study cost.

CHAPTER 6 - STUDY MILESTONES AND SCHEDULE

DESCRIPTION OF MILESTONES

A system of milestones has been established to help monitor and manage study completion. Following is a highlight of each milestone.

(F1) – Feasibility Cost-Sharing Agreement Signed – Initiate Feasibility Study

The feasibility study will be initiated by the signing of the FCSA. This milestone marks the beginning of the feasibility phase. The F1 milestone marks the transition from reconnaissance phase to feasibility phase.

(F2) – Public Scoping Workshop

The purpose of the public workshop was to present the feasibility study and to solicit public views and issues and fulfills NEPA requirements. The public workshop was organized and conducted by the sponsors with CESPK participation and technical support.

(F3) – Feasibility Scoping Meeting (FSM) (F3)

The purpose of the F3 conference is to verify critical assumptions leading to determination of the without-project condition and screening of preliminary alternatives. Representatives from CESPD, CESPK, and sponsors will attended this meeting. Pre-meeting documentation for conference attendees was made available prior to the meeting.

(F4) – Alternative Review Conference (ARC)

The Alternative Review Conference with CESPD evaluates the final plans and reaches a consensus that the evaluations are adequate to select a plan and prepare AFB issues.

(F4a) – Alternative Formulation Briefing (AFB)

The purpose of the AFB is to review the proposed plan and discuss policy issues, leading to early Washington level acceptance of proposed recommendations and resolution of the issues. CESPK will present the alternative formulation and identify the tentatively selected plan. Representatives from HQUSACE, CESPD, CESPK, and sponsors will attend the AFB. Pre-meeting documentation for AFB attendees will be made available at least 21 calendar days prior to the meeting. CESPD Planning Chief will chair the meeting. A final AFB guidance memorandum will be signed by HQUSACE within 15 working days of the AFB.

(F5) – Draft Report to HQUSACE, EPA, & Public

Based on satisfactory completion of responses to the AFB guidance memorandum, the draft report will be forwarded to CESPD and HQUSACE concurrent with its release for public

review (45-day field level coordination).

(F6) – Public Review/Meeting on Draft Report and EIS/EIR

CESPK will present results of the study and EIS/EIR to the public and receive comments during the 45-day public review period.

(F7) – Feasibility Review Conference (FRC) (Optional)

The final feasibility review conference will be held with CESPD and HQUSACE participation to identify policy compliance actions that are required to complete the final report.

(F8) – Final Report to Division

CESPK will submit the final Feasibility Report to CESPD in accordance with guidance in ER 1105-2-100.

(F9) –Public Notice

The Division Engineer's transmittal letter providing the final report to HQUSACE for review.

STUDY SCHEDULE

The proposed schedule for the LSJRFS is included in Appendix B. The schedule shows all milestones and the associated tasks, which must occur between each milestone. The Division Engineer's Transmittal Letter is scheduled about 1 month after submittal of the final Feasibility Report. It is expected that processing the Feasibility Report through Washington-level review to Congress will add approximately 3 to 4 months to the feasibility phase period. The estimated costs and schedule are subject to change.

CHAPTER 7 - QUALITY CONTROL PLAN

QUALITY CONTROL PLAN OBJECTIVES

The primary objective of this quality control plan is to ensure that the accomplishment and products of the LSJRFS are of high quality. This will be done by establishing the appropriate level of evaluation of technical products and processes to ensure that they meet customer requirements and comply with applicable laws, regulations, and sound technical practices of the disciplines involved.

CESPK Project Manager is responsible for ensuring that agency technical review of the Feasibility Report, EIS/EIR, and related materials are resourced and executed consistent with the current CESPD and CESPK Quality Management Plans and associated technical review implementation guidance. CESPD will provide quality assurance, facilitate coordination with other districts to provide an ATR Team Leader and other members for inter-district review, and provide technical and planning management support to CESPK, as needed, in resolving major policy and technical issues.

GUIDELINES FOR TECHNICAL REVIEW

Products (identified in a paragraph below) will be reviewed for compliance with appropriate public laws; engineering regulations, circulars, and manuals; planning and policy guidance; and standard engineering and scientific practices. The guidelines for independent technical review are set forth in CESPD-R- 1110-1-8, “South Pacific Division Quality Management Plan,” September 2004, and in the corresponding “Sacramento District Quality Management Plan,” March 2004.

LEVEL OF DETAIL OF REVIEW

Study products will be reviewed at a feasibility level of detail for:

- Compliance with established policy and other appropriate guidance
- Adequacy of the scope of the document
- Appropriateness of all planning, engineering, design, and environmental assumptions and methods, including development of without-project assumptions
- Appropriateness of data used, including level of detail
- Appropriateness of alternatives evaluated
- Consistency
- Accuracy
- Comprehensiveness
- Reasonableness of results

PRODUCTS FOR REVIEW

All of the products of the tasks listed in the detailed SOW's in Chapters 4, 5, and 6 will be subject to ATR. As a part of ATR, seamless single discipline review will be accomplished and documented prior to the release of materials to other members of the study team or integrated into the overall study. PDT members and their respective Section Chiefs will be responsible for accuracy of the documentation and computations through District Quality Control, design checks and other internal procedures prior to the ATR.

ATR will occur prior to major decision points in the planning process at the CESPD milestones so that the technical results can be relied on in setting the direction for further study. These products will include documentation for the CESPD mandatory milestone conferences (F3, F4, and F4A), HQUSACE IRCs, and the draft and final reports. These products will be essentially complete before ATR is undertaken. Since this quality control will have occurred prior to each milestone conference, the conference will address critical outstanding issues and set the direction for the next step of the study since a firm technical basis for making decisions will have already been established. In general, the ATR will be initiated at least 4 weeks prior to sending a complete and certified Pre-Conference Document and Decision Documents (draft and final FR and EIS/EIR).

For products that are developed under contract, the contractor will be responsible for quality control through an independent technical review. Quality assurance of the contractor's quality control will be the responsibility of the District and the ATR team. The ATR team will review the following documents:

- PMP and update(s)
- Feasibility Study Scoping Meeting (FSM) Pre-Conference Document (F3 Milestone
- Alternatives Review Conference (ARC) Pre-Conference Document (F4 Milestone; Plan Formulation and Screening)
- Alternative Formulation Briefing (AFB) Pre-AFB Document (F4A Milestone)
- Draft FR and EIS/EIR (F5 Milestone)
- Final FR EIS/EIR (F8 Milestone)

Appropriate ATRT members will also review the following study products prior to their incorporation into the overall study (seamless review):

- Hydrology
- Flood Plains
- Plan Formulation
- Hydraulic Design
- Structural Design
- Geotechnical/Geologic Design
- Design Quantities, Figures, and Plates
- Value Engineering/Value Management (VE/VM) Analysis

- Cost Estimates
- Economic Analysis
- Risk Analysis
- Real Estate Assessment

ATR and PDT members will review all products provided by the sponsor.

REVIEW PLAN

A Review Plan was prepared and, as required by ER 1105-2-410. The Review Plan addresses District Quality Control, Agency Technical Review , Independent External Peer Review and model certification requirements. The Review Plan was approved in November 2008 and can be found in Appendix C.

COST ESTIMATE FOR QUALITY MANAGEMENT

The costs for conducting ATR are included in the individual SOW's that are included in Chapters 4 and 5. District quality management activities of Branch and Division Chiefs are included in Supervision and Administration. The total cost for quality management is approximately **$348,000**, which is approximately **3** percent of the study cost estimate. Seamless review occurs throughout the study process, as required. Specific review efforts will also occur associated with the In-Progress Review Conferences, ARC, AFB, the draft report, and the final report.

KNOWN POLICY QUESTIONS

There are no known major policy issues at this time.

MAJOR TECHNICAL ISSUES

There are no known major technical issues at this time. CESPK and non-Federal sponsors will coordinate and work to achieve consensus on the types and applications of appropriate of technical tools, analyses and methods, and related strategies and assumptions. Higher echelons of the study partners will be informed and engaged as appropriate.

PMP QUALITY CERTIFICATION

The PMP was certified on December 12, 2004 by CESPK and SJAFCA. The Chief of Planning Division has certified that (1) an agency technical review process for the PMP has been completed, (2) all issues have been addressed, (3) the streamlining initiatives proposed in this PMP will result in a technically adequate product, and (4) appropriate quality control plan

requirements have been adequately incorporated into this PMP. The signed certification is included as **Appendix F**.

As a living document the PMP is subject to change. This revision is the first of such changes.

FEASIBILITY PHASE CERTIFICATION

The documentation of the ATR will be included with the submission of the interim pre-conference and decision documents to CESPD. Such documentation of the ATR will be accompanied by a certification indicating that the ATR process has been completed and that all technical issues have been resolved. The certification requirement applies to all documentation that will be forwarded to either CESPD or HQUSACE for review or approval. The Chief of Planning Division will certify the pre-conference documentation for the HQUSACE IRCs and the draft Feasibility Report. The District Commander will certify the final Feasibility Report, which includes the signed recommendation of the District Commander. This certification will follow the example that is included as Appendix H of the CESPD Quality Management Plan and will be signed by the Chief of Planning Division and the CESPK District Commander.

This study will require independent external peer review, in addition to the standard internal ATR. Both ATR and IEPR will be coordinated with the Corps' National Planning Center of Expertise for Flood Risk Management.

APPENDIX A
Study Location Map

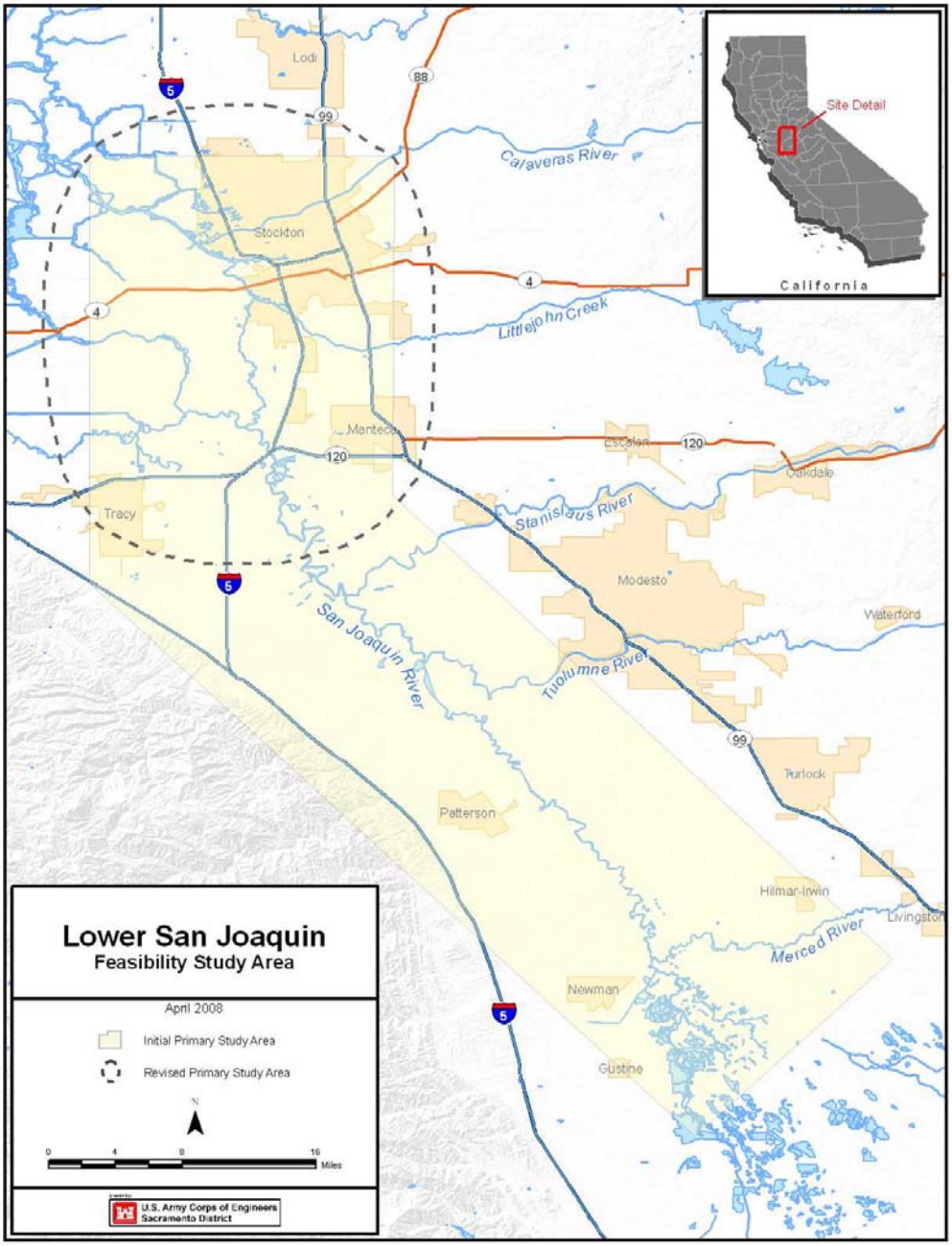

Figure 1. Study Area Location, Lower San Joaquin River Feasibility Study

APPENDIX B
Study Schedule

APPENDIX C
Review Plan

DEPARTMENT OF THE ARMY
SOUTH PACIFIC DIVISION, U.S. ARMY CORPS OF ENGINEERS
1455 MARKET STREET
SAN FRANCISCO, CALIFORNIA 94103-1399

20 NOV 2008

CESPD-PDC

Subject: Review Plan approval for the Lower San Joaquin River, CA Flood Risk Management and Ecosystem Restoration Feasibility Study.

The attached Review Plan for the Lower San Joaquin River, CA Flood Risk Management and Ecosystem Restoration Feasibility Study has been prepared in accordance with EC 1105-2-410. Please note that the EC 1105-2-408, referenced in the attached review plan, expired on 30 September 2007. Accordingly there should be primary reliance on EC 1105-2-410.

The Review Plan has been made available for public comment, and the comments received have been incorporated into the Review Plan. The Review Plan has been coordinated with and endorsed by the Flood Risk Management Planning Center of Expertise (PCX) of the South Pacific Division which is the lead office to execute this plan. For further information, contact the PCX at 415-503-6852.

The Review Plan includes independent external peer review.

I hereby approve this Review Plan, which is subject to change as study circumstances require, consistent with study development under the Project Management Business Process. Subsequent revisions to this Review Plan or its execution will require new written approval from this office.

Encls

JOHN R. McMAHON
BG, USA
Commanding

DEPARTMENT OF THE ARMY
U.S. ARMY ENGINEER DISTRICT, SACRAMENTO
CORPS OF ENGINEERS
1325 J STREET
SACRAMENTO, CALIFORNIA 95814-2922

CESPK-PD-W

MEMORANDUM FOR: Commander, South Pacific Division (ATTN: CESPD-PD-C, (Berresford)

SUBJECT: Request for Approval of Review Plan for the Lower San Joaquin River, California, Flood Risk Management and Ecosystem Restoration Feasibility Study.

1. In accordance with EC 1105-2-410, Review of Decision Documents, dated 22 August 2008, the subject Review Plan is provided for approval by the Commander, South Pacific Division (Enclosure 1). This is the first submittal of a Review Plan for the subject study.

2. This Review Plan is in compliance with the EC and has been coordinated with the applicable Planning Centers of Expertise (PCX). The PCX for Flood Risk Management is designated as the lead PCX, and as such, coordinated the Review Plan with the PCX for Ecosystem Restoration. The PCX concurrence memorandum is provided as Enclosure 2.

3. Please address any questions about this Review Plan to Ms. Alicia Kirchner, (916) 557-6767, who is serving as the interim project planner. Upon approval of this Review Plan, please provide notification to this office so we can post it to the Sacramento District public website. Upon posting of the approved Review Plan, the District will notify the vertical team. I appreciate your quick attention to this matter.

Sincerely,

Francis C. Piccola
Chief, Planning Division
Sacramento District

Encls

REVIEW PLAN

LOWER SAN JOAQUIN RIVER, CALIFORNIA
FLOOD RISK MANAGEMENT AND ECOSYSTEM RESTORATION
FEASIBILITY STUDY

SACRAMENTO DISTRICT

NOVEMBER 2008

Revision 1 – N/A
FRM-PCX Review

REVIEW PLAN
LOWER SAN JOAQUIN RIVER, CALIFORNA
FLOOD RISK MANAGEMENT AND ECOSYSTEM RESTORATION
FEASIBILITY STUDY
SACRAMENTO DISTRICT

APPENDICES

REVIEW PLAN

LOWER SAN JOAQUIN RIVER, CALIFONRIA
FLOOD RISK MANAGEMENT AND ECOSYSTEM RESTORATION
FEASIBILITY STUDY
SACRAMENTO DISTRICT

1. PURPOSE AND REQUIREMENTS

A. Purpose. This document outlines the Review Plan for the Lower San Joaquin River, California, Flood Risk Management and Ecosystem Restoration Feasibility Study. This feasibility study process is anticipated to cumulate in a decision document to Congress for potential authorization of a new project. Engineering Circular (EC) *Peer Review of Decision Documents* 1105-2-408, dated 31 May 2005, (1) established procedures to ensure the quality and credibility of Corps decision documents by adjusting and supplementing the review process, and (2) required that documents have a peer review plan. That EC applies to all feasibility studies and reports and any other reports that lead to decision documents that require authorization by Congress. The Lower San Joaquin River Basin Feasibility Report is anticipated to result in recommendations to Congress for authorization of a project and is therefore covered by this EC.

A subsequent circular, *Review of Decision Documents*, EC 1105-2-410, dated 22 August 2008, revises the technical and overall quality control review processes for decision documents. It formally distinguishes between technical review performed in-district (District Quality Control, "DQC") and out-of-district resources (formerly Independent Technical Review, "ITR," now Agency Technical Review, "ATR"). It also reaffirms the requirement for Independent External Peer Review (IEPR); this is the most independent level of review and is applied in cases that meet certain criteria where the risk and magnitude of a proposed project are such that a critical examination by a qualified team outside of the U.S. Army Corps of Engineers (USACE) is warranted.

B. Requirements. EC 1105-2-410 outlines the requirement of the three review approaches (DQC, ATR, and IEPR). EC 1105-2-408 provides guidance on Corps Planning Centers of Expertise (PCX) involvement in the approaches. This document addresses review of the decision document as it pertains to both approaches and planning coordination with the appropriate PCX. The Lower San Joaquin River, California, Feasibility Study will investigate flood risk management (FRM) and ecosystem restoration (ER) issues in the study area. The non-Federal partners have expressed a strong desire that FRM be considered the primary focus of the feasibility study, while identifying opportunities for ecosystem restoration where they are consistent with FRM features. Therefore, the PCX for FRM is considered to be the primary PCX for coordination. The PCX for FRM will coordinate with the PCX for ER as appropriate.

(1) District Quality Control. DQC is the review of basic science and engineering work products focused on fulfilling the project quality requirements defined in the Lower San Joaquin River, Feasibility Study Project Management Plan (PMP) for the study (to which this Review Plan will ultimately be appended). It is managed in the Sacramento District and may be conducted by in-house staff as long as the reviewers are not doing the work involved in the study, including contracted work that is being reviewed. Basic quality control tools include a Quality Management Plan (QMP) 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 the approval by the District Commander. For the Lower San Joaquin River Feasibility Study, non-PDT members and/or supervisory staff will conduct this review for major draft and final products, including products provided by the non-Federal sponsors as in-kind services following review of those products by the PDT. It is expected that the Major Subordinate Command (MSC)/District QMP address the conduct and documentation of this fundamental level of review. A Quality Control Plan (QCP) is included in the PMP for the subject study and addresses DQC; DQC is not addressed further in this Review Plan. DCQ is required for this study.

(2) Agency Technical Review. EC 1105-2-410 recharacterized ATR (which replaces the level of review formerly known as Independent Technical Review) 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 a 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. EC 1105-2-408 requires that DrChecks https://www.projnet.org/projnet/) be used to document all ATR comments, responses, and associated resolution accomplished. This Review Plan outlines the proposed approach to meeting this requirement for the Lower San Joaquin River, California, Feasibility Study. ATR is required for this study.

(3) Independent External Peer Review. EC 1105-2-410 recharacterized the external peer review process that was originally added to the existing Corps review process via EC 1105-2-408. 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. IEPR is managed by an outside eligible organization (OEO) that is described in the Internal Review Code Section 501(c) (3), is exempted from Federal tax under Section 501(a), of the Internal Revenue Code of 1986; is independent; is free from conflicts of interest; does not carry out or advocate for or against Federal water resources projects; and has experience in establishing and administering IEPR panels. The scope of review will address all the underlying planning, engineering, including safety assurance, economics, and environmental analyses performed, not just one aspect of the project. This Review Plan outlines the planned approach to meeting this requirement for the Lower San Joaquin River, California, Feasibility Study. IEPR is required for this study.

(4) Policy and Legal Compliance Review. In addition to the technical reviews, 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, ER 1105-2-100. Technical review described in EC 105-2-410 are to augment and complement the policy review processes by addressing compliance with published Army polices pertinent to planning products, particularly polices on analytical methods and the presentation of findings in decision documents. DQC and ATR efforts are to include the necessary expertise to address compliance with published planning policy. Counsel will generally not participate on ATR teams, but may at the discretion of the district or as directed by higher authority. When policy and/or legal concerns

arise during DQC or 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 ER 1105-2-100. IEPR teams are not expected to be knowledgeable of Army and administration polices, nor are they expected to address such concerns. An IEPR team should be given the flexibility to bring important issues to the attention of decision makers. Legal reviews will be conducted concurrent with ATR of the preliminary, draft and final feasibility report and environmental impact statement.

(5) Planning Center of Expertise (PCX) Coordination. EC 1105-2-408 and EC 1105-2-410 outline PCX coordination in conjunction with preparation of the Review Plan. This Review Plan is being coordinated with the PCX for Flood Risk Management (FRM), who in turn will coordinate with the PCX for Ecosystem Restoration (ER) as appropriate. The PCX for FRM is responsible for the accomplishment and quality of ATR and IEPR for the Lower San Joaquin River, California, Feasibility Study. The PCX for FRM may conduct the review or manage the review to be conducted by others.

(6) Review Plan Approval and Posting. In order to ensure the Review Plan is in compliance with the principles of EC 1105-2-410 and the MSC's QMP, the Review Plan must be approved by the applicable MSC, in this case the Commander, South Pacific Division (SPD). Once the Review Plan is approved, the Sacramento District will post it to its district public website and notify SPD and the PCX for FRM.

(7) Safety Assurance Review. In accordance with Section 2035 of WRDA 2007, EC 11052-410 requires that all projects addressing flooding or storm damage reduction undergo a safety assurance review during design and construction. Safety assurance factors must be considered in all reviews for those studies. Implementation guidance for Section 2035 is under development. When guidance is issued, the study will address its requirements for addressing safety assurance factors, which at a minimum will be included in the draft report and appendixes for public and agency review. Prior to preconstruction engineering and design (PED) of the identified for construction, a PMP will be developed that will include safety assurance review. Safety assurance review will also be accomplished during construction.

2. PROJECT DESCRIPTION

A. Decision Document. The purpose of the study is to identify and flood-related and ecosystem-related issues in the Lower San Joaquin River study area. The decision document 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 is a General Investigations study 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. ER measures would likely include restoration of floodplain function and habitat. The feasibility phase of this project is cost shared 50 percent Federal, 50 percent non-Federal with the project sponsors, the State of California Central Valley Flood Protection Board (CVFPB), San Joaquin County, and the San Joaquin Area Flood Control Agency (SJAFCA).

B. General Site Description. The study area is along the lower (northern) portion of the San Joaquin River system in the Central Valley of California (see Figure 1). The San Joaquin River originates on the western slope of the Sierra Nevada and emerges from the foothills at Friant Dam. The river flows west to the Central Valley, where it is joined by the Fresno, Chowchilla, Merced, Tuolumne, Stanislaus and Calaveras rivers, and smaller tributaries as it flows north to

the Sacramento-San Joaquin Delta (Delta), which in turn flows into the San Francisco Bay en route to the Pacific Ocean. The primary study area includes the main stem of the San Joaquin River and its floodplains from the Mariposa Bypass downstream to and including the city of Stockton. This includes the distributor channels of the San Joaquin River in the southernmost reaches of the Delta: Paradise Cut and Old River as far north as Tracy Boulevard; Little Johns Creek and Farmington Dam areas southeast of Stockton; and north of Stockton including the Lodi Waste Water Treatment Plan at Thornton Road and Interstate 5. The overall study area includes those areas adjacent to the primary study area which could be influenced by potential actions to address the identified problems and needs.

C. Project Scope. The study will focus on FRM and ER alternatives along the Lower San Joaquin River from the Mariposa Bypass to and including the city of Stockton. The non-Federal sponsors are interested in reducing flood risk to the existing urbanized areas in the city of Stockton, and parts of Tracy and Manteca, and the public infrastructure outside the city of Lodi. They are interested in accomplishing ecosystem restoration within this area of primary interest for FRM.

There is an area to the south of Stockton that has been subject to repeated attempts for urbanization. The area, referred to as River Islands, has been the focus of negotiations between the CVFPB (a non-Federal sponsor for the feasibility study), development interests, the Natural Resources Defense Counsel and the Natural Heritage Institute. As a result of those negotiations, the CVFPB has indicated that they would like the feasibility study to include consideration of a high flow bypass channel as a FRM measure. Local interests are pursuing a study resolution to direct the study to include that measure. Inclusion of such a measure is consistent with the flood-related problems, objectives, and potential solutions that will be under consideration as part of the feasibility study.

D. Problems and Opportunities. The primary flood-related problems in the study area are (1) the potential for levee failure and (2) reduced capacity in channels due to sedimentation and sediment deposition. Primary ecosystem problems are (1) construction of levees have separated rivers from historic floodplains and (2) construction of reservoirs has altered historic flow regimes, both of which have resulted in loss of floodplain process and associated native habitats

E. Potential Methods. Potential FRM measures range from adding, modifying, and/or re-regulating storage on major tributaries and new transitory storage within the floodplains to increasing conveyance through raising levees, widening channels and floodway areas, dredging, and constructing/modifying weirs and bypasses. Non-structural floodplain management measures would also be considered. For ecosystem restoration, measures range from restoring riparian, wetlands, and floodplain habitats through conservation easements to constructing setback levees for habitat and possibly reoperating existing reservoirs to provide beneficial flows.

F. 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 appendix B. 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 studies; GIS mapping and graphics; hydrology studies, reservoir operations study and report; hydraulic analysis and report; hydraulic data collection and mapping; Engineering Design Analysis and Report; Geotechnical and geology Studies & Report; cost engineering and report; 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 this Review Plan).

G. 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 appendix B.

H. Model Certification. The USACE Planning Models Improvement Program (PMIP) was established in 2003 to assess the state of planning models in the USACE and to make recommendations to assure that high quality methods and tools are available to enable informed decisions on investments in the Nation's water resources infrastructure and natural environment. The main objective of the PMIP is to carry out "a process to review, improve and validate analytical tools and models for USACE Civil Works business programs." In carrying out this initiative, a PMIP Task Force was established to examine planning model issues, assess the state of planning models in the Corps, and develop recommendations on improvements to planning models and related analytical tools. The PMIP Task Force collected the views of Corps leaders and recognized technical experts, and conducted investigations and numerous discussions and debates on issues related to planning models. It identified an array of model-related problems, conducted a survey of planning models, prepared papers on model-related issues, analyzed numerous options for addressing these issues, formulated recommendations, and wrote a final report that is the basis for the development of this Circular. The Task Force considered ongoing Corps initiatives to address planning capability, and built upon these where possible. Examples include several efforts under the Planning Excellence Program (training, specialized planning centers of expertise, modeling); the Science & Engineering Technology (SET) initiative (an EC on the SET initiative models is expected to be published in August 2005) and associated Technical Excellence Network (TEN), which endeavors to provide uniform Science and Engineering tools and practices to the Corps and share them throughout; and, recognition of existing Quality Assurance/Quality Control programs and internal technical review within the Districts.

For the purposes of this Circular, planning models are defined 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. It includes all models used for planning, regardless of their scope or source, as specified in the following sub-paragraphs. This Circular does not cover engineering models used in planning which will be certified under a separate process to be established under SET.

The computational models to be employed in the Lower San Joaquin River, California, Feasibility Study have either been developed by or for the USACE. Model certification and approval for all identified planning models will be coordinated through the PCX as needed. Project schedules and resources will be adjusted to address this process for certification and PCX coordination. They are:

1. HEC-FDA (Current working version undergoing review for certification; expected to be certified within the first 1 year of the study): This model, developed by the Corps' Hydrological Engineering Center, will assist the PDT in applying risk analysis methods

for flood damage reduction studies as required by, EM 1110-2-1419. This program:

- Provides a repository for both the economic and hydrologic data required for the analysis
- Provides the tools needed to understand the results
- Calculates the Expected Annual Damages and the Equivalent Annual Damages
- Computes the Annual Exceedence Probability and the Conditional Non-Exceedence Probability
- Implements the risk-based analysis procedures contained in EM 1110-2-1619

2. 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 r gionally modified version of these methodologies and individual models ar.. 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.
3. 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.

The following are considered to be engineering models as opposed to planning models and undergo a different review and approval process for usage. Engineering tools anticipated to be used in this study are:

1. MCACES or MII: These are cost estimating models.
2. HEC-HMS: By applying this model the PDT is able to:
   - Define the watersheds' physical features
   - Describe the metrological conditions
   - Estimate parameters
   - Analyze simulations
   - Obtain GIS connectivity
3. HEC-ResSim: This model predicts the behavior of reservoirs and to help reservoir operators plan releases in real-time during day-to-day and emergency operations. The following describes the major features of HEC-ResSim
   - Graphical User Interface
   - Map-Based Schematic
   - Rule-Based Operations
4. HEC-RAS: The function of this model is to complete one-dimensional hydraulic calculations for a full network of natural and man made channels. HEC-RAS major capabilities are:
   - User interface
   - Hydraulic Analysis
   - Data storage and Management
   - Graphics and reporting

5. HEC-2: The HEC-2 program computes water surface profiles for one-dimensional steady, gradually varied flow in rivers of any cross section.
6. FLO-2D: This model will be used for the overbank reaches.
7. Groundwater Modeling System (GMS): This model is used to conduct seepage analysis.
8. Utaxas4: This model is used to conduct slope stability analysis.

3. AGENCY TECHNICAL REVIEW PLAN

For feasibility studies, ATR is managed by the PCX. For this feasibility study, due to the heavy emphasis on flood risk management, the PCX for FRM will identify individuals to perform ATR. Sacramento District can provide suggestions on possible reviewers.

A. General. An ATR Manager shall be designated for the ATR process. The proposed ATR Manager for this project is to be determined, but will have expertise in project planning. The ATR Manager is responsible for providing information necessary for setting up the review, communicating with the Study Manager, providing a summary of critical review comments, collecting grammatical and editorial comments from the ATR team (ATRT), ensuring that the ATRT has adequate funding to perform the review, facilitating the resolution of the comments, and certifying that the ATR has been conducted and resolved in accordance with policy. ATR will be conducted for project planning, environmental compliance, economics, hydrology and reservoir operations, hydraulic design, civil design, geotechnical engineering, cost engineering, real estate, cultural resources; reviews of more specific disciplines maybe identified if necessary.

B. Agency Technical Review Team (ATRT). The ATRT 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. The members will roughly mirror the composition of the PDT and wherever possible, reside outside of the South Pacific Division region. It is anticipated that the team will consist of about 10 reviewers. The ATRT members will be identified at the time the review is conducted and will be presented in appendix B.

C. Communication. The communication plan for the ATR is as follows:

(1) The team will use DrChecks to document the ATR process. The Study Manager will facilitate the creation of a project portfolio in the system to allow access by all PDT and ATRT members. An electronic version of the document, appendices, and any significant and relevant public comments shall be posted in Word 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 manager one hard copy (with color pages as applicable) of the document and appendices for each ATRT 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 ATRT 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 Study Manager shall inform the ATR manager 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 report and appendices with comments incorporated shall be posted at ftp://ftp.usace.army.mil/pub/ for use during back checking of the comments.

(6) Team members shall contact ATRT 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.

(8) The ATRT, the PDT, and the vertical team shall conduct an after action review (AAR) no later than 2 weeks after the policy guidance memo is received from HQUSACE for the for the AFB and draft reports.

D. Funding

(1) The PDT district shall provide labor funding by cross charge labor codes. Funding for travel, if needed, will be provided through government order. The Study Manager will work with the ATR manager to ensure that adequate funding is available and is commensurate with the level of review needed. The current cost estimate for this review is $138,000. Any funding shortages will be negotiated on a case by case basis and in advance of a negative charge occurring.

(2) The team leader shall provide organization codes for each team members and a responsible financial point of contact (CEFMS responsible employee) for creation of labor codes.

(3) Reviewers shall monitor individual labor code balances and alert the ATRT Study Manager to any possible funding shortages.

E. Timing and Schedule

(1) Throughout the development of this document, the team will conduct seamless review to ensure planning quality.

(2) The ATR will be convened early in the study and will participate in the Technical Review Strategy Session (TRSS) with the PDT and DST. The TRSS is to verify the basic plan of study and the rationale for key planning assumptions.

(3) The ATR will be conducted on the Feasibility Scoping Meeting documentation and assumptions; the Alternative Formulation Briefing documentation; the draft Feasibility Report; and if changes are made to the draft report, those changes will be reviewed in the Final Feasibility Report.

(4) The PDT will hold a "page-turn" session to review the draft report to ensure consistency across the disciplines and resolve any issues prior to the start of ITR. Writer/editor services will be performed on the draft prior to ITR as well.

(5) The ATR process for this document will follow the following timeline. Actual dates will be scheduled once the period draws closer. All products produced for these milestones will

be reviewed, including those produced as in-kind services by the non-Federal sponsors.

ATR Timeline

Task	Date
Participation in TRSS	Prior to F2
ATR Feasibility Scoping Meeting material	September 2009
ATR Alternatives Review Conference material[1]	July 2010
ATR of Draft Report Comment Period	November 2010
Kickoff meeting	During 1st week
ATR Comments	End 2rd week
PDT Responses	End 3rd week
Responses Back check	End 4th week
Alternative Formulation Briefing (AFB)	January 2011
AFB Policy Memo Issued	February 2011
ATR Certification Draft Report	September 2011
Public Review of Draft Report	October 2011
ATR Certification Final Report	December 2011
ATR After Action	January 2012
Final District Report Review	March 2012

[1]Required by the Major Subordinate Command.

F. Review

(1) ATRT responsibilities are as follows:

(a) Reviewers shall review conference material and the draft report 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 report 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:

1 a clear statement of the concern
2 the basis for the concern, such as law, policy, or guidance
3 significance for the concern
4 specific actions needed to resolve the comment

(e) The "Critical" comment flag in DrChecks shall not be used unless the comment is discussed with the ATR manager and/or the Study Manager first.

(2) PDT Team responsibilities are as follows:

(a) The team shall review comments provided by the ATRT 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.

G. 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 manager and, if not resolved by the ATR Manager, it should be brought to the attention of the planning chief who will need to sign the certification. ATRT members shall keep the ATR manager informed of problematic comments. The vertical team will be informed of any policy variations or other issues that may cause concern during HQ review.

H. Certification

To fully document the ATR process, a statement of technical review will be prepared. Certification by the ATR Manager and the Study Manager will occur once issues raised by the reviewers have been addressed to the review team's satisfaction and the final report is ready for submission for HQ review. Indication of this concurrence will be documented by the signing of a certification statement (Appendix A). A summary report of all comments and responses will follow the statement and accompany the report throughout the report approval process. An interim certification will be provided by the ATR team lead to indicate concurrence with the report to date until the final certification is performed when the report is considered final.

I. Alternative Formulation Briefing (AFB)

The AFB for this project will occur after the majority of the ATR comments have been resolved. It is possible that the briefing will result in additional technical or policy comments from high level reviewers for resolution. The resolution of significant policy comments may result in major changes to the document. Therefore, the ATR Manager will perform a brief review of the report to ensure that technical issues are resolved.

4. INDEPENDENT EXTERNAL PEER REVIEW PLAN

This decision document will present the details of a feasibility study undertaken to evaluate structural and non-structural FRM and ER measures to address problems in the study area. EC 1105-2-408 set forth and EC 1105-2-410 reaffirmed thresholds that trigger IEPR: "In cases

where there are public safety concerns, a high level of complexity, novel or precedent-setting approaches; where the project is controversial, has significant interagency interest, has a total project cost greater than $45 million, or has significant economic, environmental and social effects to the nation, IEPR will be conducted." This study is not expected to contain influential scientific information nor be a highly influential scientific assessment. This study area is highly urbanized and consequently there are public safety concerns. The study will be highly complex because of the extensive river and tributary system; the existing reservoir and levee system; and the high degree of urbanization. This project has the potential to be controversial and will likely have significant agency and public interest (as evidenced by the Sacramento and San Joaquin River Basins Comprehensive Study). It can be assumed that the ultimate cost associated with a recommended plan is likely to be in the high hundreds of millions of dollars range. For these reasons, IEPR will be conducted. IEPR is currently estimated to be $100,000. IEPR is a project cost. The IEPR panel review will be Federally funded. In-house costs associated with obtaining the IEPR panel contract as well as responding to IEPR comments will be cost shared expenses. It is not anticipated that the public, including scientific or professional societies, will be asked to nominate potential external peer reviewers.

Disciplines that are anticipated to undergo IEPR are hydrology, hydraulic and geotechnical engineering and feasibility-level design, and economics. Work undertaken as part of these technical disciplines is considered to be highly complex due to the size of the study area as well as the existing complex water storage and conveyance system in the study area. Specific factors for this determination are (1) the large population center; (2) the complex existing levee and water conveyance system; (3) through-levee seepage, under-levee seepage and subsidence issues associated with the existing levees; (4) and the complex hydraulic system and associated floodplain. Of these products that will undergo IEPR, all will be reviewed by the PDT and undergo DCQ prior to submittal for IEPR. This includes products that are produced by the non-Federal sponsors as in-kind services.

A. Project Magnitude. For reasons described in the preceding paragraphs, the magnitude of this project is determined as high.

B. Project Risk. This project is considered to have high overall risk. The potential for failure is high because of the complex nature of the study area. It will be important to make sound planning assumptions in application of all the modeling and judgment and to do so will require application of multiple levels of review. Public and agency input will be sought in order to minimize the potential for controversy. Uncertainty of success of the project ultimately will be low to moderate – if the proposed review processes are implemented - because the methods used for evaluating the project are standard and the concept of implementing proposed project features is not innovative.

C. Vertical Team Consensus. This Review Plan will serve as the coordination document to obtain vertical team consensus. Subsequent to PCX approval, the plan will be provide to the vertical team for approval. MSC approval of the plan will indicate vertical team consensus.

D. Products for Review. Interim products for hydrology, hydraulic and geotechnical design and economics will be provided before the draft report is released for public review. The full IEPR panel will receive the entire draft feasibility 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.

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

(1) The panel will use DrChecks to document the IEPR process. The Study Manager will facilitate the creation of a project portfolio in the system to allow access by all PDT and the OEO. An electronic version of the document, appendices, and any significant and relevant public comments shall be posted in Word format 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. This is specifically in accordance with the EC 1105-2-410 Frequently Asked Questions, dated 3 November 2008.

(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 Study Manager 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 report and appendices 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 a final Review Report to be provided to the PDT not later than 60 days after the close of the public and agency review of the draft report. This report shall be scoped as part of the effort to engage the IEPR panel. The Sacramento 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 IEPR Review Report and will post both the Review Report and the Corps final responses to the public website.

F. Funding

The PCX for FRM will identify someone independent from the PDT to scope the IEPR and develop an Independent Government Estimate. The Sacramento District will provide funding to the IEPR panel.

5. PUBLIC AND AGENCY REVIEW

The public and agencies will have multiple opportunities to participate in this study. The earliest opportunity will be as part of the public scoping process during the first year of the study. Public review of the draft feasibility report will occur after issuance of the AFB policy guidance memo and concurrence by HQUSACE that the document is ready for public release. As such, public comments other than those provided at any public meetings held during the planning process will not be available to the review teams. Public review of the draft report will begin approximately 1 month after the completion of the ATR process and policy guidance memo. The period will last a minimum of 45 days as required for an Environmental Impact Statement. One or more public workshops will be held during the public and agency review period. Comments received during the public comment period for the draft report could be provided to the IEPR team prior to completion of the final Review Report and to the ATRT before review of the final Decision Document. The public review of necessary state or Federal permits will also take place during this period. A formal State and Agency review will occur concurrently with the public review. However, it is anticipated that intensive coordination with these agencies will have occurred concurrent with the planning process. Upon completion of the review period, comments will be consolidated in a matrix and addressed, if needed. A comment resolution meeting will take place if needed to decide upon the best resolution of comments. A summary of the comments and resolutions will be included in the document. A plan for public participation will be developed early in the study which might identify informal as well as additional formal forums for participation in the study.

6. PLANNING CENTERS OF EXPERTISE COORDINATION

The appropriate PCX for this document is the National Flood Risk Management Center of Expertise located at SPD. The PCX for FRM will coordinate with the National Ecosystem Restoration Planning Center of Expertise at MVD, as appropriate. This Review Plan will be submitted to the PCX for FRM Director, Eric Thaut, for review and comment. Since it was determined that this project is high risk, an IEPR will be required. As such, the PCX will be asked to manage the IEPR review. For ATR, the PCX is requested to nominate the ATR team as discussed in paragraph 3.b. above. The approved Review Plan will be posted to the Sacramento District's public website. Any public comments on the Review Plan will be collected by the Office of Water Project Review (OWPR) and provided to the Sacramento District for resolution and incorporation if needed.

7. APPROVALS

The PDT will carry out the Review Plan as described. The Study Manager will submit the plan to the PDT District Planning Chief for approval. Formal coordination with PCX for FRM will occur through the PDT District Planning Chief.

8. POINTS OF CONTACT

Questions about this Review Plan may be directed to Ms. Alicia Kirchner (interim), Sacramento District Project Delivery Team Planning contact, at (916) 557-6767, or alicia.e.kirchner@usace.army.mil, or to Mr. Eric Thaut, Program Manager for the Planning Center of Expertise for Flood Risk Management, at (415) 503-6852, or eric.w.thaut@usace.army.mil.

REVIEW PLAN

LOWER SAN JOAQUIN RIVER, CALIFORNIA
FLOOD RISK MANAGEMENT AND ECOSYSTEM RESTORATION
FEASIBILITY STUDY

SACRAMENTO DISTRICT

APPENDIX A
STATEMENT OF TECHNICAL REVIEW

COMPLETION OF INDEPENDENT TECHNICAL REVIEW
LOWER SAN JOAQUIN RIVER, CALIFORNIA
FLOOD RISK MANAGEMENT AND ECOSYSTEM RESTORATION

FEASIBILITY STUDY, ENVIRONMENTAL IMPACT STATEMENT/ENVIRONMENTAL IMPACT REPORT AND APPENDICES

The Sacramento District has completed the project implementation report (feasibility report), environmental impact statement/environmental impact report and appendices of the Lower San Joaquin River Feasibility Study. Notice is hereby given that an agency technical review, that is appropriate to the level of risk and complexity inherent in the project, has been conducted as defined in the Review Plan. During the 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 the ATR have been resolved.

TBD _____ _____

NAME
Team Leader, Lower San Joaquin River
Feasibility Study
Agency Technical Review Team

Date

CERTIFICATION OF AGENCY TECHNICAL REVIEW

A summary of all comments and responses is attached. 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 the independent technical review of the project have been fully resolved.

_____ _____

Francis C. Piccola
Chief, Planning Division

Date

REVIEW PLAN

LOWER SAN JOAQUIN RIVER, CALIFORNIA
FLOOD RISK MANAGEMENT AND ECOSYSTEM RESTORATION
FEASIBILITY STUDY

SACRAMENTO DISTRICT

APPENDIX B

PRODUCT DELIVERY TEAM

Name	Discipline	Phone	Email
Russ Rote	Project Manager	916-557-6672	Russ.L.Rote@usace.army.mil
Alicia Kirchner (interim)[1]	Study Manager/Planning	916-557-6767	Alicia.E.Kirchner@usace.army.mil
Richard Torbik (interim)	Civil Design	916-557-6698	Richard.A.Torbik@usace.army.mil
Matt Davis (interim)	Environmental Analysis	916-557-6708	Matthew.G.Davis@usace.army.mil
Kevin Richardson	Hydrology/Reservoir Operations	916-557-7108	Kevin.A.Richardson@usace.army.mil
Scott Stonestreet	Hydraulic Design	916-557-7719	Scott.E.Stonestreet@usace.army.mil
Kurt Keilman (interim)	Economics	916-557-7836	Kurt.Keilman@usace.army.mil
Joseph Yee (interim)	Cost Engineering	916-557-6990	Joseph.W.Yee@usace.army.mil
TBD	Real Estate/Lands		
Sannie Osborn (interim)	Cultural Resources	916-557-6861	Sannie.K.Osborn@usace.army.mil
Mary Perlea	Geotechnical Engineering	916-557-7185	Mary.P.Perlea@usace.army.mil

[1] Primary contact for this Review Plan.

AGENCY TECHNICAL REVIEW TEAM

Name	Discipline	Phone	Email
TBD	ATR Manager/Plan Formulation		
TBD	Civil Design		
TBD	Environmental Resources		
TBD	Hydrology/Reservoir Operations		
TBD	Hydraulics		
TBD	Economics		
TBD	Cost Engineering [1]		
TBD	Real Estate/Lands		
TBD	Cultural Resources		
TBD	Geotechnical Engineering		

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

INDEPENDENT EXTERNAL PEER REVIEW PANEL

Name	Discipline	Phone	Email
TBD	Hydrology		
TBD	Hydraulic Design		
TBD	Geotechnical Engineering		
TBD	Economics		

VERTICAL TEAM

Name	Discipline	Phone	Email
Karen Berresford	District Support Team Mgr		Karen.G.Berresford@usace.army.mil
Ken Zwickl	Regional Integration Team		Kenneth.J.Zwickl@usace.army.mil

PLANNING CENTER OF EXPERTISE
FLOOD RISK MANAGEMENT

Name	Discipline	Phone	Email
Eric Thaut[1]	Program Manager, PCX Flood Risk Management	415-503-6852	Eric.W.Thaut@usace.army.mil
David Vigh,	Program Manager, PCX Ecosystem Restoration	601-634-5854	David.A.Vigh@usace.army.mil

[1] Primary PCX is FRM, who will coordinate with PCX for EC as appropriate.

10 November 2008

MEMORANDUM FOR Alicia Kirchner, CESPK

SUBJECT: FRM-PCX endorsement of the Review Plan for the Lower San Joaquin River, CA Flood Risk Management and Ecosystem Restoration Feasibility Study.

1. The FRM-PCX has reviewed the Review Plan (RP) for the subject study and concurs that the RP satisfies peer review policy requirements outlined in EC 1105-2-410 Review of Decision Documents, dated 22 Aug 2008.

2. The RP was submitted to the FRM-PCX for review on 29 September 2008. The FRM-PCX comments on the draft PRP were submitted to the District and coordinated with the ECO-PCX on 14 October 2008. The revised RP was back-checked on 10 November 2008 and all comments have been satisfactorily addressed. The RP checklist for the study is attached for reference.

3. The FRM-PCX endorses the RP for approval by the MSC Commander. Upon approval of the RP, please provide a copy of the approved RP, a copy of the MSC Commander approval memorandum, and the link to where the RP is posted on the District website.

4. Thank you for the opportunity to assist in the preparation of the RP. Please contact me if you have any questions or when further peer review assistance is required.

/s/
Eric Thaut
Program Manager, National Planning Center of Expertise
for Flood Risk Management (FRM-PCX)

Encl

Enclosure

Review Plan Checklist

Date: 11-10-2008
Originating District: Sacramento District
Project/Study Title: Lower San Joaquin River, CA Flood Risk Management and Ecosystem Restoration Feasibility Study
District POC: Alicia Kirchner, 916 557 7440
FRM-PCX Reviewer: Eric Thaut, 415 503 6852

Any evaluation boxes checked 'No' indicate the RP may not comply with ER 1105-2-410 (22 Aug 2008) and should be explained. Additional coordination and issue resolution may be required prior to MSC approval of the Review Plan.

REQUIREMENT	REFERENCE	EVALUATION
1. Is the Review Plan (RP) a stand alone document?	EC 1105-2-410, Para 8a	Yes ☒ No ☐
a. Does it include a cover page identifying it as a RP and listing the project title, originating district or office, and date of the plan? b. Does it include a table of contents? c. Is the purpose of the RP clearly stated and EC 1105-2-410 referenced? d. Does it reference the Project Management Plan (PMP) of which the RP is a component? e. Does it succinctly describe the three levels of peer review: District Quality Control (DQC), Agency Technical Review (ATR), and Independent Technical Peer Review (IEPR)? f. Does it clearly state that DQC and ATR are required for all decision documents and that IEPR may be required? g. Does it include a paragraph stating the title, subject, and purpose of the decision document to be reviewed? h. Does it list the names and disciplines of the Project Delivery Team (PDT)?* **Note: It is highly recommended to put all team*	EC 1105-2-410, Appendix B, Para 4a	a. Yes ☒ No ☐ b. Yes ☒ No ☐ c. Yes ☒ No ☐ d. Yes ☒ No ☐ e. Yes ☒ No ☐ f. Yes ☒ No ☐ g. Yes ☒ No ☐ h. Yes ☒ No ☐ **Comments:**

member names and contact information in an appendix for easy updating as team members change or the RP is updated.		
2. Is the RP detailed enough to assess the necessary level and focus of peer review?	EC 1105-2-410, Appendix B, Para 3a	Yes ☒ No ☐
a. Does it indicate which parts of the study will likely be challenging?	EC 1105-2-410, Appendix B, Para 3a	a. Yes ☒ No ☐ b. Yes ☒ No ☐
b. Does it provide a preliminary assessment of where the project risks are likely to occur and what the magnitude of those risks might be?	EC 1105-2-410, Appendix B, Para 3a	c. Yes ☒ No ☐ d. Yes ☒ No ☐ e. Yes ☒ No ☐
c. Does it indicate if the project/study will include an environmental impact statement (EIS)? *Is an EIS included? Yes ☒ No ☐* *If yes, IEPR is required.*	EC 1105-2-410 Para 7c & 8f	
d. Does it address if the project report is likely to contain influential scientific information or be a highly influential scientific assessment? *Is it likely? Yes ☐ No ☒* *If yes, IEPR is required.*	EC 1105-2-410, Appendix B, Para 4b	
e. Does it address if the project is likely to have significant economic, environmental, and social affects to the nation, such as (but not limited to):	EC 1105-2-410, Para 6c	
• more than negligible adverse impacts on scarce or unique cultural, historic, or tribal resources?	EC 1105-2-410 Para 8f	
• substantial adverse impacts on fish and wildlife species or their habitat, prior to implementation of mitigation?	EC 1105-2-410 Para 8f	
• more than negligible adverse impact on species listed as endangered or threatened, or to the designated critical habitat of such species, under the Endangered Species Act, prior to implementation of mitigation?	EC 1105-2-410 Para 8f	

Is it likely? Yes ☒ No ☐ *If yes, IEPR is required.*		
f. Does it address if the project/study is likely to have significant interagency interest? *Is it likely? Yes ☒ No ☐* *If yes, IEPR is required.*	EC 1105-2-410, Para 6c	f. Yes ☒ No ☐ g. Yes ☒ No ☐ h. Yes ☒ No ☐
g. Does it address if the project/study likely involves significant threat to human life (safety assurance)? *Is it likely? Yes ☒ No ☐* *If yes, IEPR is required.*	EC 1105-2-410, Appendix D, Para 1b	i. Yes ☒ No ☐ j. Yes ☒ No ☐ **Comments:**
h. Does it provide an estimated total project cost? *What is the estimated cost: >$100M* *(best current estimate; may be a range)* *Is it > $45 million? Yes ☒ No ☐* *If yes, IEPR is required.*	EC 1105-2-410, Appendix D, Para 1b	
i. Does it address if the project/study will likely be highly controversial, such as if there will be a significant public dispute as to the size, nature, or effects of the project or to the economic or environmental costs or benefits of the project? *Is it likely? Yes ☒ No ☐* *If yes, IEPR is required.*	EC 1105-2-410, Appendix D, Para 1b	
j. Does it address if the information in the decision document will likely 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? *Is it likely? Yes ☒ No ☐* *If yes, IEPR is required.*	EC 1105-2-410, Appendix D, Para 1b	
3. Does the RP define the appropriate level of peer review for the project/study?	EC 1105-2-410, Para 8a	Yes ☒ No ☐

b. Does it state that ATR will be conducted or managed by the lead PCX? c. Does it state whether IEPR will be performed? *Will IEPR be performed? Yes ☒ No ☐* d. Does it provide a defensible rationale for the decision on IEPR? e. Does it state that IEPR will be managed by an Outside Eligible Organization, external to the Corps of Engineers?	EC 1105-2-410, Appendix D, Para 3a EC 1105-2-410, Appendix B, Para 4b EC 1105-2-410, Para 7c	b. Yes ☒ No ☐ c. Yes ☒ No ☐ d. Yes ☒ No ☐ e. Yes ☒ No ☐ n/a ☐ **Comments:**
4. Does the RP explain how ATR will be accomplished?	EC 1105-2-410, Appendix B, Para 4l	Yes ☒ No ☐
a. Does it identify the anticipated number of reviewers? b. Does it provide a succinct description of the primary disciplines or expertise needed for the review? c. Does it indicate that ATR team members will be from outside the home district? d. Does it indicate that the ATR team leader will be from outside the home MSC? e. Does the RP state that the lead PCX is responsible for identifying the ATR team members and indicate if candidates will be nominated by the home district/MSC? f. If the reviewers are listed by name, does the RP describe the qualifications and years of relevant experience of the ATR team members?* **Note: It is highly recommended to put all team member names and contact information in an appendix for easy updating as team members change or the RP is updated.*	EC 1105-2-410, Appendix B, Para 4f EC 1105-2-410, Appendix B, Para 4g EC 1105-2-410, Para 7b EC 1105-2-410, Para 7b EC 1105-2-410, Appendix B, Para 4k(1) EC 1105-2-410, Appendix B, Para 4k(1)	a. Yes ☒ No ☐ b. Yes ☒ No ☐ c. Yes ☒ No ☐ d. Yes ☒ No ☐ e. Yes ☒ No ☐ f. Yes ☐ No ☐ n/a ☒ **Comments:**
5. Does the RP explain how IEPR will be accomplished?	EC 1105-2-410, Appendix B, Para 4k & Appendix D	**Yes ☒ No ☐ n/a ☐**

member names and contact information in an appendix for easy updating as team members change or the RP is updated.		
5. Does the RP explain how IEPR will be accomplished?	EC 1105-2-410, Appendix B, Para 4k & Appendix D	**Yes** ☒ **No** ☐ **n/a** ☐
a. Does it identify the anticipated number of reviewers? b. Does it provide a succinct description of the primary disciplines or expertise needed for the review? c. Does it indicate that the IEPR reviewers will be selected by an Outside Eligible Organization and if candidates will be nominated by the Corps of Engineers? d. Does it indicate the IEPR will address all the underlying planning, safety assurance, engineering, economic, and environmental analyses, not just one aspect of the project?	EC 1105-2-410, Appendix B, Para 4f EC 1105-2-410, Appendix B, Para 4g EC 1105-2-410, Appendix B, Para 4k(1) & Appendix D, Para 2a EC 1105-2-410, Para 7c	a. Yes ☒ No ☐ b. Yes ☒ No ☐ c. Yes ☒ No ☐ d. Yes ☒ No ☐ **Comments:**
6. Does the RP address peer review of sponsor in-kind contributions?		Yes ☒ No ☐
a. Does the RP list the expected in-kind contributions to be provided by the sponsor? b. Does it explain how peer review will be accomplished for those in-kind contributions?	EC 1105-2-410, Appendix B, Para 4j	a. Yes ☒ No ☐ b. Yes ☒ No ☐ n/a ☐ **Comments:**
7. Does the RP address how the peer review will be documented?		Yes ☒ No ☐
a. Does the RP address the requirement to document ATR and IEPR comments using DrChecks? b. Does the RP explain how the IEPR will be documented in a Review Report? c. Does the RP document how written	EC 1105-2-410, Para 8g(1) EC1105-2-410, Appendix B, Para 4k(13)(b) EC 1105-2-410,	a. Yes ☒ No ☐ b. Yes ☒ No ☐ n/a ☐ c. Yes ☒ No ☐ n/a ☐ d. Yes ☒ No ☐ n/a ☐

responses to the IEPR Review Report will be prepared? d. Does the RP detail how the district/PCX will disseminate the final IEPR Review Report, USACE response, and all other materials related to the IEPR on the internet and include them in the applicable decision document?	Appendix B, Para 4l EC 1105-2-410, Para 8g(2) & Appendix B, Para 4l	**Comments:**
8. Does the RP address Policy Compliance and Legal Review?	EC 1105-2-410, Para 7d	Yes ☒ No ☐ **Comments:**
9. Does the RP present the tasks, timing and sequence (including deferrals), and costs of reviews?	EC 1105-2-410, Appendix B, Para 4c & Appendix C, Para 3d	Yes ☒ No ☐
a. Does it provide a schedule for ATR including review of the Feasibility Scoping Meeting (FSM) materials, Alternative Formulation Briefing (AFB) materials, draft report, and final report? b. Does it include interim ATR reviews for key technical products? c. Does it present the timing and sequencing for IEPR? d. Does it include cost estimates for the peer reviews?	EC 1105-2-410, Appendix C, Para 3g EC 1105-2-410, Appendix C, Para 3g	a. Yes ☒ No ☐ b. Yes ☒ No ☐ c. Yes ☒ No ☐ n/a ☐ d. Yes ☒ No ☐ **Comments:**
10. Does the RP indicate the study will address Safety Assurance factors (required for Flood Risk Management and Coastal Storm Damage Reduction projects)? Factors to be considered include: • Where failure leads to significant threat to human life • Novel methods\complexity\ precedent-setting models\policy changing conclusions • Innovative materials or techniques	EC 1105-2-410, Para 2 & Appendix D, Para 1c	**Yes ☒ No ☐ n/a ☐** **Comments:** Suggest adding a discussion in the RP to address item 10 - DONE.

• Design lacks redundancy, resiliency of robustness • Unique construction sequence or acquisition plans • Reduced\overlapping design construction schedule		
11. Does the RP address model certification requirements?	EC 1105-2-407	Yes ☒ No ☐
a. Does it list the models and data anticipated to be used in developing recommendations (including mitigation models)? b. Does it indicate the certification/approval status of those models and if certification or approval of any model(s) will be needed? c. If needed, does the RP propose the appropriate level of certification/approval for the model(s) and how it will be accomplished?	EC 1105-2-410, Appendix B, Para 4i	a. Yes ☒ No ☐ b. Yes ☒ No ☐ c. Yes ☒ No ☐ n/a ☐ **Comments:**
12. Does the RP address opportunities for public participation?		Yes ☒ No ☐
a. Does it indicate how and when there will be opportunities for public comment on the decision document? b. Does it indicate when significant and relevant public comments will be provided to reviewers before they conduct their review? c. Does it address whether the public, including scientific or professional societies, will be asked to nominate potential external peer reviewers? d. Does the RP list points of contact at the home district and the lead PCX for inquiries about the RP?	EC 1105-2-410, Appendix B, Para 4d EC 1105-2-410, Appendix B, Para 4e EC 1105-2-410, Appendix B, Para 4h EC 1105-2-410, Appendix B, Para 4a	a. Yes ☒ No ☐ b. Yes ☒ No ☐ c. Yes ☒ No ☐ d. Yes ☒ No ☐ **Comments:**
13. Does the RP address coordination with the appropriate Planning Centers of Expertise?	EC 1105-2-410, Para 8a	Yes ☒ No ☐
a. Does it state if the project is single or multi-purpose? Single ☐ Multi ☒ b. Does it identify the lead PCX for peer		a. Yes ☒ No ☐ b. Yes ☒ No ☐

review? Lead PCX: **FRM** c. If multi-purpose, has the lead PCX coordinated the review of the RP with the other PCXs as appropriate?	EC 1105-2-410, Appendix D, Para 3c	c. Yes ☒ No ☐ n/a ☐ **Comments:** The FRM-PCX will coordinate with the ECO-PCX by forwarding this checklist along with the draft RP.
14. Does the RP address coordination with the Cost Engineering Directory of Expertise (DX) in Walla Walla District for ATR of cost estimates, construction schedules and contingencies for all documents requiring Congressional authorization?	EC 1105-2-410, Appendix D, Para 3	Yes ☒ No ☐
a. Does it state if the decision document will require Congressional authorization? b. If Congressional authorization is required, does the state that coordination will occur with the Cost Engineering DX?		a. Yes ☒ No ☐ b. Yes ☒ No ☐ n/a ☐ **Comments:**
13. Other Considerations: This checklist highlights the minimum requirements for an RP based on EC 1105-2-410. Additional factors to consider in preparation of the RP include, but may not be limited to: a. Is a request from a State Governor or the head of a Federal or state agency to conduct IEPR likely? b. Is the home district expecting to submit a waiver to exclude the project study from IEPR? c. Are there additional Peer Review requirements specific to the home MSC or district (as described in the Quality Management Plan for the MSC or district)? d. Are there additional Peer Review needs unique to the project study?	EC 1105-2-410, Appendix D, Para 1b EC 1105-2-410, Appendix D, Para 1d	**Comments:**
Additional Comments: HQUSACE has clarified use of Dr. Checks for IEPR (in the EC 1105-2-410 FAQ dated 3 Nov 2008): "HQ does not expect IEPR panelists to personally input their information the DrChecks system. The basic process follows: The OEO will compile the comments of the panelists, enter them into DrChecks, and forwards the comments to the district. The district will consult their internal team 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 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." Per this clarification, the PDT may choose to revise the RP (Paragraph 4e) with regard to how IEPR is documented in Dr. Checks - DONE.

APPENDIX D
Template for Project Communication Plan

PURPOSE:

This template describes the basic elements of a U.S. Army Corps of Engineers Communications Plan. The Corps Project Management Business Process directs that all projects, events, and issues of significant public interest have a communication plan. Our goal is to provide accurate, timely, and consistent information to the public, stakeholders, and interested members of the Corps team.

Communication is most powerful when everyone at every level is able to rapidly respond to questions and tell the same story in the same way. A good plan gives everyone who speaks for the Corps – from CESPK to HQUSACE – rapid access to key messages, frequently asked questions, expert points of contact (POCs), stakeholder contacts, current status, and historical context. The Communications Plan also identifies important milestones so that project managers can schedule resources and make communications an integral part of the project management business process.

A Communications Plan consists of three parts:

(1) Research
(2) Rollout Plan
(3) Lessons Learned/Next Steps.

PART 1. RESEARCH:

(a) Describe the purpose of the project, issue, or event. *(Why are we doing this?)*

(b) Describe the desired outcome. *(What will success look like? How is it connected to the strategic objectives? Use measures if appropriate.)*

(c) Form the PDT. *(Who will be involved? Who are the subject matters experts? Who are spokespersons? Will CESPD and HQUSACE play a role and need to be involved? What is the sponsors role?)*

(d) Develop a coordination list/schedule. *(Who needs to approve the plan? Does it need DA/CEQ/OMB approval? Do sponsors need to be aware?)*

(e) List basic communication and reference documents that are being used. *(This may include conducting original research and/or gathering secondary research.)*

(f) What are relevant lessons learned?

PART 2. ROLLOUT PLAN:

(a) Key messages - *What do people need to know and remember?*

(b) Stakeholders and their roles identified - *What are their key interests?*

(c) Plan with alternatives - *How will we communicate? What are the different alternatives? Include 2-way communication whenever possible. What are the risks and benefits of each?*

(d) What is our communications posture? *Passive (ready to respond to questions). Active (working to get the word out and solicit feedback).*

(e) Timetable

(i) Who does what and when

(ii) Congressional notification

(iii) Stakeholder notification

(iv) Spokespersons identified with contact information and areas of expertise

(v) Media strategy

(vi) Communications documents

(1) News release *(Shorter is better. Use "important points to remember" and/or "Official statements" as attachments. Include quotes.)*

(2) Key messages and talking points for communicating with the stakeholders, public, news media, and employees.

(3) Anticipated questions and answers *(five you hope you get and five you don't want to be surprised by)*

(4) Fact sheets

(5) Illustrations and photos

(6) Web documents of hot topics

(7) Maps

(8) Public meetings, press tour/conference, and other events

PART 3. LESSONS LEARNED/NEXT STEPS:

(a) Media analysis - A brief recap of the coverage we got, an analysis of whether we got the message out and the tone of the stories.

(b) Lessons learned - What did we learn from this communication activity. What worked and what didn't work?

(c) Next steps - What are the next steps that are required or expected from the communication issue/event just completed?

APPENDIX E
Geospatial Data Management Plan

Geospatial Data Management Plan

Division	**South Pacific (SPD)**
District	**Sacramento (SPK)**
Date	
Project	**Lower San Joaquin River**
Location	
P2 Number	**105785**

Project/Program Manager: Russ Rote
Approval Signature: **Date:**

Geospatial Technical Lead : Casey Young
Approval Signature: **Date:**

☐ Cover Sheet Copy Sent to Division eGD&S Manager by District Geospatial Technical Lead
Date:

Cover Sheet

Geospatial Data Management Plan

1 Introduction

The Geospatial Data Management Plan (GDP) integrates geospatial data management into the Project Management Business Process (PMBP) and facilitates the implementation of enterprise data management. This data collection and management plan covers Computer Aided Design and Drafting (CADD) and Geographic Information System (GIS) products. Implementation of this plan will allow project delivery teams (PDTs) comprised of experts from various districts to work collaboratively on a project. For this collaboration to become a reality, the U.S. Army Corps of Engineers (USACE) must follow established criteria, policy and guidance for the acquisition, processing, storage, distribution, and use of geospatial data. Project delivery team members who are responsible for collecting spatial data and producing Computer Aided Design and Drafting (CADD) and Geographic Information System (GIS) products have a major role to play in the success of this effort.

1.1 Applicability

This plan shall apply to all district civil, HTRW, and military projects that will have a geospatial component at any phase of the project. Scopes of work and project management plans shall address the geospatial data component of the project to make sure that data is being collected, used and managed in such a way as to maximize its value throughout the life-cycle of the project and the related programs.

1.4 Funding

Funding for the preparation and implementation of this plan shall be provided by the individual project to which it applies.

1.5 Geospatial Responsibilities of the PDT

The PDT needs to define:

- Data objectives and quality requirements
- Data format
- Data collection methods and what data are available, in development, or stored (both on- and off-site). Timeliness of data availability.
- Data analysis and access - the uses of the data.
- How to incorporate this data into the project decision process.
- Data access, storage and control - how the data will be managed over time.

1.6 Role of the Geospatial and CADD Specialists on the Project Delivery Team (PDT)

- Support the PDT in the efficient execution of civil, HTRW, military construction and environmental restoration projects.
- Help protect the investment in CADD, geospatial data, applications and institutional knowledge.
- Facilitate the sharing of CADD and geospatial data among civil, military and environmental

projects.
- At the project initiation phase determine how large of a role CADD and geospatial technologies will play.
- Educate the project managers and PDT members on how CADD and geospatial technology can be used to add value to the project.
- Identify CADD and geospatial data requirements and ensure that the appropriate CADD, geospatial, and data model and data standards are followed. This includes following the current A/E/C CADD standard, Spatial Data Standards for Facilities, Infrastructure and Environment (SDSFIE) and development of FGDC metadata.
- Acquire existing geospatial datasets from federal, state, local agencies, the public domain and available through USACE licenses agreements.
- Reformat data as required for use with the geospatial technologies.
- Create new data layers through the integration of existing and acquired data.
- Integrate CADD and GIS data.
- Identify CADD and geospatial application requirements needed for the project.
- Develop geospatial technology applications in accordance with applicable guidelines and standards.
- Perform spatial analysis and data modeling.
- Provide data visualization and mapping products.
- Develop and maintain a geospatial data management plan for the life cycle of the project.

1.7 Geospatial Data Checklist

This checklist will be completed by project geospatial technical leads to ensure project efforts to collect geospatial and geotechnical data meet required configuration, system, and data quality requirements.

All projects that include tasks to use or produce geospatial data must clearly state what will be collected, what will be delivered, the format it will be delivered in, and who will be responsible for updates and maintenance. This is necessary whether the work is done by contract or by District staff. This checklist is designed to aid project team members with writing geospatial data collection and management portions of the Project Management Plan (PMP). **This checklist is to be filled out by the Project Manager and the project's geospatial data technical lead.** This checklist becomes a permanent part of the project's geospatial data plan and subsequently the project's PMP.

I. Project/Contract Specific Information.

1. Project Title: Lower San Joaquin River

2. Proposed Contractor/In house: In house

3. USACE Project Manager: Russ Rote

4. Geospatial data technical lead: Casey Young

II. Identify project geospatial data requirements. Do not automatically assume that there is a geospatial or geotechnical data requirement. These questions are intended to develop a rationale for identifying such a requirement.

1. Why is this effort being undertaken and why is there a geospatial or geotechnical data aspect?

A flood risk management study to reduce flood damages as economically justified while investigating opportunities for ecosystem restoration

2. What types of data will be collected? (e.g. soil samples, acquire aerial photographs, well construction information, etc.)

Soil data, topography, cross sections, bathymetry are all possible,
Aerial photos, parcel data information, infrastructure information, levee information (heights, historic information, problem areas, etc.)

---

3. How will this data be used now and in the future? (e.g. generate annual reports)

To formulate alternative solutions for the feasibility study

4. Check the following that apply to proposed data.

☐ Data will not contain location (geospatial) or (geotechnical) information. *Does not require inclusion in the District's GIS.*

☒ Data contains location (geospatial) or (geotechnical) information. This information will not be altered in the future (i.e., is temporary in nature, such as proposed well locations). This information will not need to be accessible for use in other mapping projects in the future.

☐ Data contains location (geospatial) or (geotechnical) information. All or a portion of the data may be used on future maps but the graphic attributes will never need to be queried. *Data may be stored as electronic graphic files (i.e., CAD or GIS or image files) without database connection in the District GIS, to allow creation of new maps* (e.g. report showing work site boundaries).

☒ Data contains location geospatial or geotechnical information. Will require queries and modeling to be performed on the data and its attributes in the future. *This is a potential District GIS data set* (e.g. location and concentration of contaminants at a cleanup site). Deliverables must conform to the specifications of the District's GIS.

5. HQUSACE standards compliance reporting database requirements.

Project must be entered into HQ USACE GIS/CADD standards compliance website and the database must be updated at major project milestones.

☐ Completed

☒ Not Completed, Reason GIS data for the project has not been created yet.

III. Identify proposed datasets using above information:

1. Which data sets should be included in the District eGIS? Do data structure or models (tables, etc) for this data already exist in the District eGIS or elsewhere in the Corps or will new tables, GIS layers, etc. need to be developed and added to accommodate this new data?

Data Set(s) & Their SDSFIE feature class:

Data Set	Dist. GIS Data Level (1,2,3)*	SDSFIE or A/E/C Category	New	Update
All data sets that are required are not known				
Appropriate Basedata (counties, rivers, 30m terrain, road networks, other general land use data layers)	1,2,3	x		

1 = Corporate data, must be SDSFIE or A/E/C-compliant if produced by USACE, stored in geodatabase, FGDC compliant metadata required
2 = Project data, must be SDSFIE or A/E/C-compliant if produced by USACE, stored on file server, some metadata required
3 = Interim data, must include metadata if stored on file server more than 30 days

2. Include the appropriate CADD/GIS standards and specifications in the SOW (for contracted work) or reference them in the PMP (for in house work).

IV. Data Acquisition

Is the data already available☒ Yes ☒No

☒ Geo-1-Stop checked for available data

☒ NSDI geospatial clearinghouse search completed

☐ Satellite data coordination coordinated

1. Data acquired from Other Federal, State or Local Agencies, Stakeholders, Partners, etc. The geospatial specialist and applicable PDT members shall ensure that the data obtained from external sources is used appropriately with regard to any licensing or security issues. Data acquired from these sources are **not** required to be converted to SDSFIE.

Data Use Category (if applicable) : ☒ "For General Use" ☒ Sensitive ☐ "Official Use Only" ☐ Other

Data Collected by In-House or Contract Labor
If the data does not exist, PDT members requiring the data shall be responsible for writing the scope of work for collection and delivery. The geospatial specialist shall assist with the scopes as needed and/or review them to ensure that the data is collected and delivered as follows:

- In accordance with the standards specified in reference 15, Technical Report CADD-03-, dated July 2003, Subject: Contract Language Guidelines for Acquiring Geospatial Data (CADD, GIS, CAFM) System Deliverables from Architect-Engineer (A-E) Consulting Firms.
- In accordance with the guidelines provided in reference 9, Engineer Manual 1110-1-2909 Geospatial Data and Systems, 30 September 05

- In compliance with the latest version of the Spatial Data Standards for Facilities, Infrastructure and Environment (SDSFIE).

- Provided with FGDC metadata.

- Provided in proper digital format.

When the data is received the geospatial specialist and/or PDT member shall review the deliverables for compliance with the requirements above.

Data Purchased from Vendor

☒ Data needs to be purchased May need to be purchased
☐ Source & Associated cost _____
☐ Licensing and sharing agreements for data reviewed

CADD and Geospatial Data Delivery and Management

☐ CADD Data Mgmt: ☐ ProjectWise ☐ Other _____
☒ GIS Data Mgmt: ☐ ProjectWise ☐ FTP ☐ Other_____

CADD Data Delivery: District PDT is to determine if CADD data that is geospatial in nature such as site plans, channel boundaries and depths, utilities, building locations, etc. will be converted into a GIS geodatabase format by either the geospatial specialist or provided as a deliverable from contractor. This will ensure the District has data in a GIS format for future use/analysis.

Geospatial Applications, Analysis and Modeling Needed for the Project:

☒Website ☒Geodatabase ☒Database integration with GIS

☒Surface Generation ☒Hydrogrpahic Models ☐3D Models

☒Site Selection Analysis ☒Area/Volumetric computations ☐sediment transportation

☒Flood plain delineation ☐Other_____

Deliverable Format.

Note: All geospatial and geotechnical data deliverables must comply with the standards and specifications of the District's CADD/GIS Enterprise Geospatial Data System (eGDS). Included in this are standards for complete metadata regarding the data collection and processing of the data.

1. What file format(s) will be used to prepare the project's geospatial data deliverables?

Geospatial data (shape file or personal geodatabase for GIS, Microstation for CADD, is preferred, must conform to the SDSFIE for GIS or A/E CADD Standard for CADD)

Data format: ☐ ASCII text comma delimited file (tables with column headings and point data only)
- ☒ESRI shape file
- ☒ESRI coverage
- ☒ESRI personal geodatabase

☐ ESRI SDE geodatabase
- ☒ Microstation/AutoCAD
- ☐ Other: _____

Horizontal Datum: ☐ WGS 84
- ☒NAD 83 (Preferred)
- ☐ NAD 27
- ☐ Other:

_____

Vertical Datum: ☒NAVD 88 (Preferred)

☐ NAVD 29
☐ Other:

_____

Coordinate System/Zone:

☒ State Plane
- ☐ _____North
- ☐ _____ South
- ☐ _____ East
- ☐ _____ Central
- ☐ _____ West
- ☒ Other: ___California Zone 3_Feet_____

☒Universal Transverse Mercator (UTM)
- ☒ Zone 10
- ☐ Zone __
- ☐ Zone __
- ☐ Other: _____

☐ Other: _____

☐ Other: _____

Projection:

☒Geographic
☒ Transverse Mercator
☐ Lambert Conformal Conic
☐ Albers
☐ Other:

_____

Horizontal measure:

☒ Feet
☒ Meters
☒ Latitude/Longitude
☐ Other:

_____

Vertical measure:

☒Feet
☒Meters
☐ Other:

_____

2. Will the contractor/PDT members produce a completed data package or will the project's geospatial data technical lead complete the deliverable? In most instances, the geospatial data technical lead at minimum will need to review that data and *load* it into the District's eGIS. If the contractor is to complete the data package, please indicate why this option is necessary.

☐ Contractor/PDT
Justification: _____

☒ Project geospatial data technical lead

3. Does the contractor/PDT require a copy of or access to the existing applicable District CADD/GIS data? If not, please provide justification.

Whatever data that the district has available, we will share with the contractor.

4. Will the contractor/PDT be responsible for ensuring the data is compatible with the current District CADD/GIS data standards? If not, please provide justification.

Yes, FGDC Metadata compliance along with SDSFIE Compliance is mandatory

☒ Contractor/PDT has been provided with a **current** copy of the Data Standard

☒ Contractor/PDT will contact the USACE POC regarding Data Standard requirements

5. Where will the GIS work be accomplished (location)? Applicable GIS work will be completed in house

6. Will the contractor/PDT ☒ or Geospatial Data Section-furnished GPS equipment and GIS workstations?

GPS source: ☐ NA ☐ Contractor/PDT ☒COE ☐ COE to provide training

7. Will the contractor perform post-processing on GPS data? Not known at this time

Post-Processing: ☒ NA ☐ Contractor/PDT ☐ COE ☐ COE to provide training

8. Metadata:

☒ Contractor/PDT will provide sufficient documentation regarding the electronic deliverable files as delineated in the District's CADD/GIS data standard.

Geospatial Support to Customers

Customer was contacted to determine compatibility of project data with their systems/policies?

☐ Yes ☒ No ☐
Notes_____

Data is complete and compatible with customer's CADD system and eGIS:

☐ Yes ☒ No ☐
Notes_____

V. Data Maintenance

1. Maintenance and Updates:

☐ This is a one-time data delivery.
☐ Contractor/PDT will provide regularly scheduled data updates to be added to existing files and tables.
☐ Contractor/PDT will provide maintenance and regularly scheduled complete updates of the entire table contents and associated graphics.
☒ The project's geospatial data technical lead will provide required maintenance and updates to data.

2. ☒ Project deliverables must be cataloged in the District's geospatial data inventory database.

VI. Approval

1. Project Manager:

Name: _____

Signature: _____ Date: _____

2. Geospatial Data Technical Lead:

Name: Casey Young

Signature: _____

APPENDIX F
Quality Control Certification

QUALITY CONTROL CERTIFICATION
PROJECT MANAGEMENT PLAN
Lower San Joaquin River Feasibility Study

COMPLETION OF QUALITY CONTROL ACTIVITIES

The District has completed the Project Management Plan (PMP) for the Lower San Joaquin River Feasibility Study. All quality control activities defined in the District's Quality Management Plan for PMPs have been completed. Compliance with clearly established policy principles and procedures, using justified and valid assumptions, has been verified, including whether the PMP meets the non-Federal sponsors needs and is consistent with law and current Corps policy. All issues and concerns resulting from the Agency Technical Review (ATR) of the PMP have been resolved.

_____ _____
Date Reviewer

CERTIFICATION

Certification is hereby given that (1) the ATR process for this PMP has been completed; (2) all issues have been addressed; (3) the streamlining initiatives proposed in this PMP will result in a technically adequate product; and (4) appropriate quality control plan requirements have been adequately incorporated into this PMP. In summary, the study may proceed with the feasibility phase in accordance with this PMP.

_____ _____
Date Francis Piccola
Chief, Planning Division