Final Environmental Impact Report on the

Natomas Levee Improvement Program
Phase 3 Landside Improvements Project



State Clearinghouse No. 2008072060

Prepared for:

SAFCA

Sacramento
Area Flood
Control
Agency

May 11, 2009

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ACRONYMS AND ABBREVIATIONS

ABFS	American Basin Fish Screen and Habitat Improvement Project
Airport	Sacramento International Airport
APN	Assessor Parcel Number
BMPs	best management practices
CCAD	Consolidated Capital Assessment District
CEQ	Council of Environmental Quality
CESA	California Endangered Species Act
Common Features Project	American River Common Features Project
CVFPB	Central Valley Flood Protection Board
DFG	California Department of Fish and Game
EPA	U.S. Environmental Protection Agency
FAA	Federal Aviation Administration
FEIR	Final Environmental Impact Report
FEIS	Final Environmental Impact Statement
GHG	greenhouse gas
I-5	Interstate 5
LTMP	Long-Term Management Plan
MMP	Mitigation and Monitoring Plan
NBHCP	Natomas Basin Habitat Conservation Plan
NCC	Natomas Cross Canal
NCMWC	Natomas Central Mutual Water Company
NEMDC	Natomas East Main Drainage Canal
NEPA	National Environmental Policy Act
NLIP	Natomas Levee Improvement Program
NMFS	National Marine Fisheries Service
NOI	Notice of Intent
NOP	Notice of Preparation
NPDES	National Pollutant Discharge Elimination System
PGCC	Pleasant Grove Creek Canal
Phase 1 Project	NCC South Levee Phase 1 Improvements
Phase 2 Project	NLIP Phase 2 Landside Improvements Project
Phase 3 Project	NLIP Phase 3 Landside Improvements Project
RD	Reclamation District
ROD	record of decision
SACDOT	Sacramento Department of Transportation
SACOG	Sacramento Area Council of Governments
SAFCA	Sacramento Area Flood Control Agency
SCAS	Sacramento County Airport System
SMAQMD	Sacramento Metropolitan Air Quality Management District
SMARA	Surface Mining and Reclamation Act
SRA	shaded riverine aquatic
SRFCP	Sacramento River Flood Control Project
SWPPP	storm water pollution prevention plan
TNBC	The Natomas Basin Conservancy
USACE	U.S. Army Corps of Engineers
USC	United States Code
USFWS	U.S. Fish and Wildlife Service

1.0 INTRODUCTION

The Natomas Levee Improvement Program (NLIP), Phase 3 Landside Improvements Project (Phase 3 Project), consists of improvements to a portion of the Natomas Basin's perimeter levee system in Sutter and Sacramento Counties, California, and associated landscape and irrigation/drainage infrastructure modifications, as proposed by the Sacramento Area Flood Control Agency (SAFCA). SAFCA has initiated this effort in cooperation with the California Department of Water Resources and the Central Valley Flood Protection Board (hereinafter referred to together as "State"), and the U.S. Army Corps of Engineers (USACE) Sacramento District, with the aim of incorporating the NLIP into the Natomas components of the Federally authorized American River Common Features Project (Common Features Project).

The overall purpose of the NLIP is to bring the entire 42-mile Natomas Basin perimeter levee system into compliance with applicable Federal and state standards for levees protecting urban areas. The Landside Improvements Project, which is a component of the NLIP, consists of four phases. The Phase 3 Project is one of the four project phases, and includes proposed improvements affecting approximately 13 miles of the levee system.

To implement the Phase 3 Project, SAFCA is requesting permission from USACE pursuant to Section 14 of the Rivers and Harbors Act of 1899 (33 United States Code [USC] 408, hereinafter referred to as "Section 408") for alteration of Federal project levees; Section 404 of the Clean Water Act (33 USC 1344, hereinafter referred to as "Section 404") for the placement of fill in jurisdictional waters of the United States; and Section 10 of the Rivers and Harbors Act of 1899 (33 USC 403, hereinafter referred to as "Section 10") for work performed in, under, or over navigable waters, and excavation of material from or deposition of material into navigable waters. SAFCA may also need to obtain several state approvals or permits: Central Valley Flood Protection Board encroachment permit, California Surface Mining and Reclamation Act permit, Clean Water Act Section 401 water quality certification, Clean Water Act Section 402 National Pollutant Discharge Elimination System permit, California Fish and Game Code Section 2081 incidental-take authorization, California Fish and Game Code Section 1602 streambed alteration agreement, and permits from the Sacramento Metropolitan Air Quality Management District and the Feather River Air Quality Management District.

During the comment period on the DEIS/DEIR, written comments were received from Federal, state, and local agencies; organizations; and individuals, as well as oral testimony at a public hearing held before the SAFCA Board of Directors on March 19, 2009.

The FEIR consists of the DEIS/DEIR and this document, which includes comments on the DEIS/DEIR, responses to those comments, and revisions to the DEIS/DEIR. Both documents should be used as the informational basis for addressing the environmental impacts of implementing the Phase 3 Project.

1.1 PURPOSE AND INTENDED USES OF THIS DOCUMENT

SAFCA has prepared this FEIR in accordance with the requirements of the California Environmental Quality Act (CEQA). SAFCA is the lead agency for complying with CEQA. CEQA requires a lead agency that has prepared a DEIR to consult with and obtain comments from public agencies that have legal jurisdiction concerning the proposed project, and to provide the general public with an opportunity to comment on the DEIR. The FEIR is the mechanism for responding to these comments. This FEIR has been prepared to respond to comments received on the DEIS/DEIR, which are reproduced in this document; and to present corrections, revisions, and other clarifications and amplifications to the DEIS/DEIR, including minor project modifications, made in response to these comments and as a result of SAFCA's ongoing planning efforts. This FEIR will be used to support the SAFCA decision regarding whether to approve the Phase 3 Project.

This FEIR will also be used by CEQA responsible agencies, such as the Central Valley Flood Protection Board and Central Valley Regional Water Quality Control Board and trustee agencies, such as the California Department of Fish and Game, to ensure that they have met the requirements of CEQA before deciding whether to issue discretionary permits for the Phase 3 Project over which they have authority. It may also be used by other state, regional, and local agencies that may have an interest in resources that could be affected by the project or would issue permits and/or other regulatory approvals.

USACE will prepare a separate Final Environmental Impact Statement (FEIS) in accordance with the requirements of the National Environmental Policy Act (NEPA). USACE is the lead Federal agency for complying with NEPA. The FEIS will constitute a reprint of the entire DEIS/DEIR, and will include comment letters, responses to comments, and any text changes/clarifications/modifications. The FEIS will be circulated for a 30-day public review period after which USACE will consider any comments it receives on the FEIS, make decisions on whether to grant permission for the Phase 3 Project pursuant to Section 408, issue permits pursuant to Sections 404 and 10, and issue a record of decision (ROD).

This FEIR is tiered from, or incorporates by reference, information contained in the following documents:

- *Environmental Impact Report on Local Funding Mechanisms for Comprehensive Flood Control Improvements for the Sacramento Area*, State Clearinghouse No. 2006072098 (Local Funding EIR) (SAFCA 2007a), which evaluated impacts expected to result from the Phase 1 Project at a project level and the NLIP at a program level;

- *Environmental Impact Report on the Natomas Levee Improvement Program, Landside Improvements Project*, State Clearinghouse No. 2007062016 (Phase 2 EIR) (SAFCA 2007b), which evaluated impacts expected to result from the Phase 2 Project at a project level and the NLIP at a program level;

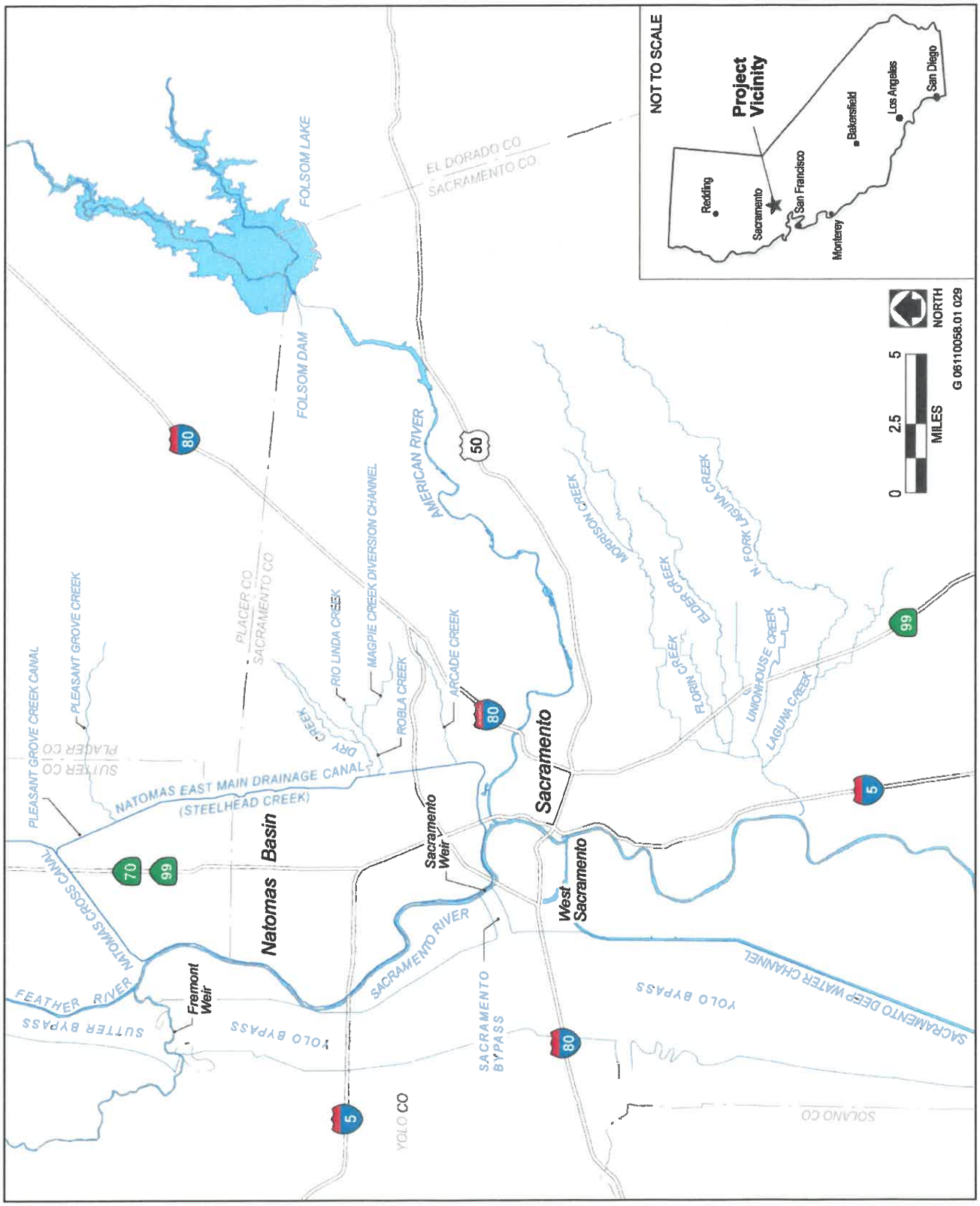
- *Environmental Impact Statement for 408 Permission and 404 Permit to Sacramento Area Flood Control Agency for the Natomas Levee Improvement Project* (Phase 2 EIS) (USACE 2008), which evaluated impacts expected to result from the Phase 2 Project at a project level and the NLIP at a program level; and

- *Supplement to the Environmental Impact Report on the Natomas Levee Improvement Program, Landside Improvements Project—Phase 2 Project*, State Clearinghouse No. 2007062016 (Phase 2 SEIR) (SAFCA 2009a), which evaluated impacts expected to result from the modification to the Phase 2 Project at a project level.

Copies of these documents are available to the public at SAFCA's office at 1007 7th Street, 7th Floor, Sacramento, California, during normal business hours, and are also available on SAFCA's Web site, at http://www.safca.org/Programs_Natomas.html.

1.2 PROJECT LOCATION

The Natomas Basin is located at the confluence of the American and Sacramento Rivers. Encompassing approximately 53,000 acres, the Basin extends northward from the American River and includes portions of the city of Sacramento, Sacramento County, and Sutter County (**Plate 1**). In addition to the American and Sacramento Rivers to the south and west, the Natomas Basin is bordered to the north by the Natomas Cross Canal (NCC) and to the east by the Pleasant Grove Creek Canal (PGCC) and the Natomas East Main Drainage Canal (NEMDC) (**Plate 1**). The NCC diverts the runoff from a large watershed in western Placer and southern Sutter Counties around the Natomas area and is a major contributor to the flows in the upper reach of the Sacramento River channel in SAFCA's jurisdiction. The NEMDC is an engineered channel along the southeastern flank of Natomas. Tributaries to the NEMDC include Dry Creek, Arcade Creek, Rio Linda Creek, Robla Creek, and Magpie Creek Diversion Channel. The Natomas Basin is protected from high flows in these tributaries and in the American and Sacramento Rivers by a Federal perimeter levee system.



Source: Adapted by EDAW in 2007 based on CASIL Layers; SAFCA 2007a

Project Location **Plate 1**

The Natomas Basin floodplain is occupied by more than 83,000 residents and over $8.2 billion in damageable property, including Sacramento International Airport (Airport) and extensive urban development, primarily in the southern one-third of the Basin. The remaining agricultural lands in the Natomas Basin provide habitat for several important wildlife species. This habitat is protected under Federal and state laws, and expansion of the urban footprint into the remaining agricultural areas is governed by the *Natomas Basin Habitat Conservation Plan* (NBHCP), which is aimed at setting aside and conserving tracts of agricultural land that are needed to sustain the affected species (City of Sacramento, Sutter County, and The Natomas Basin Conservancy 2003).

1.3 NATOMAS LEVEE IMPROVEMENT PROGRAM, LANDSIDE IMPROVEMENTS PROJECT PHASING

As stated above, the overall purpose of the NLIP is to bring the entire 42-mile Natomas Basin perimeter levee system into compliance with applicable Federal and state standards for levees protecting urban areas. Summarized below is the relationship of the NLIP Landside Improvement Project phases to one another. **Table 1-1** presents the Landside Improvements Project NLIP components and construction timing of each project phase; these are also shown in **Plate 2**.

Table 1-1
Components and Construction Timing of the Landside Improvements Project Phases

Year	Project Phase	Project Component
2007–2008	Phase 1 Project	Natomas Cross Canal south levee improvements (westernmost 12,500 feet): Through-seepage and underseepage remediation
2009	Phase 2 Project	Natomas Cross Canal south levee improvements: Levee raising and seepage remediation
		Sacramento River east levee (Reaches 1–4B): Levee raising and seepage remediation
		Relocation of the Upper Elkhorn Canal (North Drainage Canal to Elkhorn Reservoir)
		Construction of the Upper GGS/Drainage Canal (North Drainage Canal to just south of Elkhorn Reservoir)
		Removal of a deep culvert at the location of Reclamation District 1000 Pumping Plant No. 2
		Borrow and reclamation at: Airport north bufferlands; Brookfield; Dunmore; RD 1001; and Sutter Pointe
		Habitat creation and management
		Right-of-way acquisition
		Infrastructure relocation and realignment
	Phase 3 Project	Sacramento River east levee (Reaches 5A–9B): Levee raising and seepage remediation
		Relocation of the Lower Elkhorn Canal (Elkhorn Reservoir to just south of West Elkhorn Boulevard)
		Construction of the Lower GGS/Drainage Canal (Elkhorn Reservoir to West Drainage Canal at I-5)
		Reconstruction of RD 1000 Pumping Plant No. 2
		Borrow and reclamation at Airport north bufferlands; Dunmore; Pacific Terrace; Private Properties in Reaches 5B, 6A, and 7; South Sutter, LLC; and Sutter Pointe
		Habitat creation and management
2010		Pleasant Grove Creek Canal west levee: Levee raising, slope flattening, and widening; and seepage remediation
		Natomas East Main Drainage Canal west levee (Elkhorn Boulevard to NEMDC Stormwater Pumping Station): Levee widening and flattening and seepage remediation
		Natomas East Main Drainage Canal west levee (NEMDC Stormwater Pumping Station to Northgate Boulevard): Seepage remediation and slope stability remediation
		Infrastructure relocation and realignment
		Encroachment management
		Right-of-way acquisition
		Borrow and reclamation at Brookfield, Elkhorn Borrow Area, Krumenacher, RD 1001, and Twin Rivers Unified

Table 1-1 Components and Construction Timing of the Landside Improvements Project Phases		
Year	Project Phase	Project Component
		School District
		Reconfigure Airport West Ditch
		Landside vegetation removal in Sacramento River east levee Reaches 10–12A
	Phase 4a Project	Sacramento River east levee (Reaches 10–15): Levee raising and seepage remediation
		Natomas Cross Canal south levee: Levee raising and seepage remediation at two locations
		Relocation and extension of the Riverside Canal away from the existing Sacramento River east levee (Reaches 11B–17)
		Modifications to Natomas Central Mutual Water Company's Riverside Pumping Plant and RD 1000's Pumping Plants Nos. 3 and 5
		Borrow site excavation and reclamation at Fisherman's Lake Borrow Area, I-5 Borrow Area, Elkhorn Borrow Area, and Airport north bufferlands
2011		Habitat creation and management
		Infrastructure relocation and realignment
		Landside vegetation removal
		Landside vegetation removal in Sacramento River east levee Reaches 12A–15
		Right-of-way acquisition
		Encroachment management
	Phase 4b Project	Sacramento River east levee (Reaches 16–20): Seepage remediation
		American River north levee (Reaches 1–4): Seepage remediation
		Natomas East Main Drainage Canal west levee (Sankey Road to Elkhorn Boulevard): Levee raising and widening, slope flattening, and seepage remediation
		West Drainage Canal: Improvements south of I-5
		Borrow site excavation and reclamation
		Habitat creation and management
		Infrastructure relocation and realignment
		Landside vegetation removal
		Right-of-way acquisition
		Encroachment management
2012	Phase 4c Project	American River north levee (Reaches 1–4): Improvements to achieve "200-year" flood risk reduction
		Pleasant Grove Creek Canal west levee: Improvements to achieve "200-year" flood risk reduction
		Natomas East Main Drainage Canal west levee: Improvements to achieve "200-year" flood risk reduction
Notes: Airport = Sacramento International Airport; GGS = Giant Garter Snake; NEMDC = Natomas East Main Drainage Canal; RD = Reclamation District; I-5 = Interstate 5 Source: Data compiled by EDAW in 2009, based on information provided by SAFCA		

Each of the project phases discussed below also includes associated habitat, drainage, irrigation, and related infrastructure improvements.

1.3.1 PHASE 1 PROJECT

In February 2007, the SAFCA Board of Directors certified the Local Funding EIR (SAFCA 2007a), which examined the physical environmental effects associated with the program of flood damage reduction measures

and related mitigation and habitat enhancements that the local funding mechanisms would be used to finance. The Local Funding EIR covered NLIP Phases 1–4 at a program level of detail and Phase 1 (NCC South Levee Phase 1 Improvements [Phase 1 Project]) at a project-specific level of detail. The Phase 1 Project, consisting of improvements to address through-seepage and underseepage in the westernmost 12,500 feet of the NCC south levee, was constructed in 2007 and 2008.

1.3.2 PHASE 2 PROJECT

In November 2007, the SAFCA Board of Directors certified the Phase 2 EIR, which covered the three additional phases of "landside" components of the NLIP that were proposed for construction in 2008 (Phase 2 Project), 2009 (Phase 3 Project), and 2010 (Phase 4 Project). The Phase 2 EIR was tiered from the analysis in the Local Funding EIR, consistent with Section 15152 of the State CEQA Guidelines. The 2008 construction phase (now referred to as the Phase 2 Project) was analyzed at a project level, and the 2009–2010 construction phases (now referred to as the Phase 3 and 4 Projects, or the remainder of the Landside Improvements Project) were analyzed at a program level. The Phase 2 Project was approved for implementation by the SAFCA Board of Directors on November 29, 2007.

To implement the Phase 2 Project, SAFCA required permission from USACE pursuant to Section 408 for alteration of a Federal project levee and Section 404 for the discharge of fill into jurisdictional waters of the United States. Therefore, following completion of the Phase 2 EIR and local approval of the Phase 2 Project, USACE prepared the Phase 2 EIS (USACE 2008). A ROD was issued in January 2009, at which time USACE also issued the 408 permission and 404 permit for the Phase 2 Project.

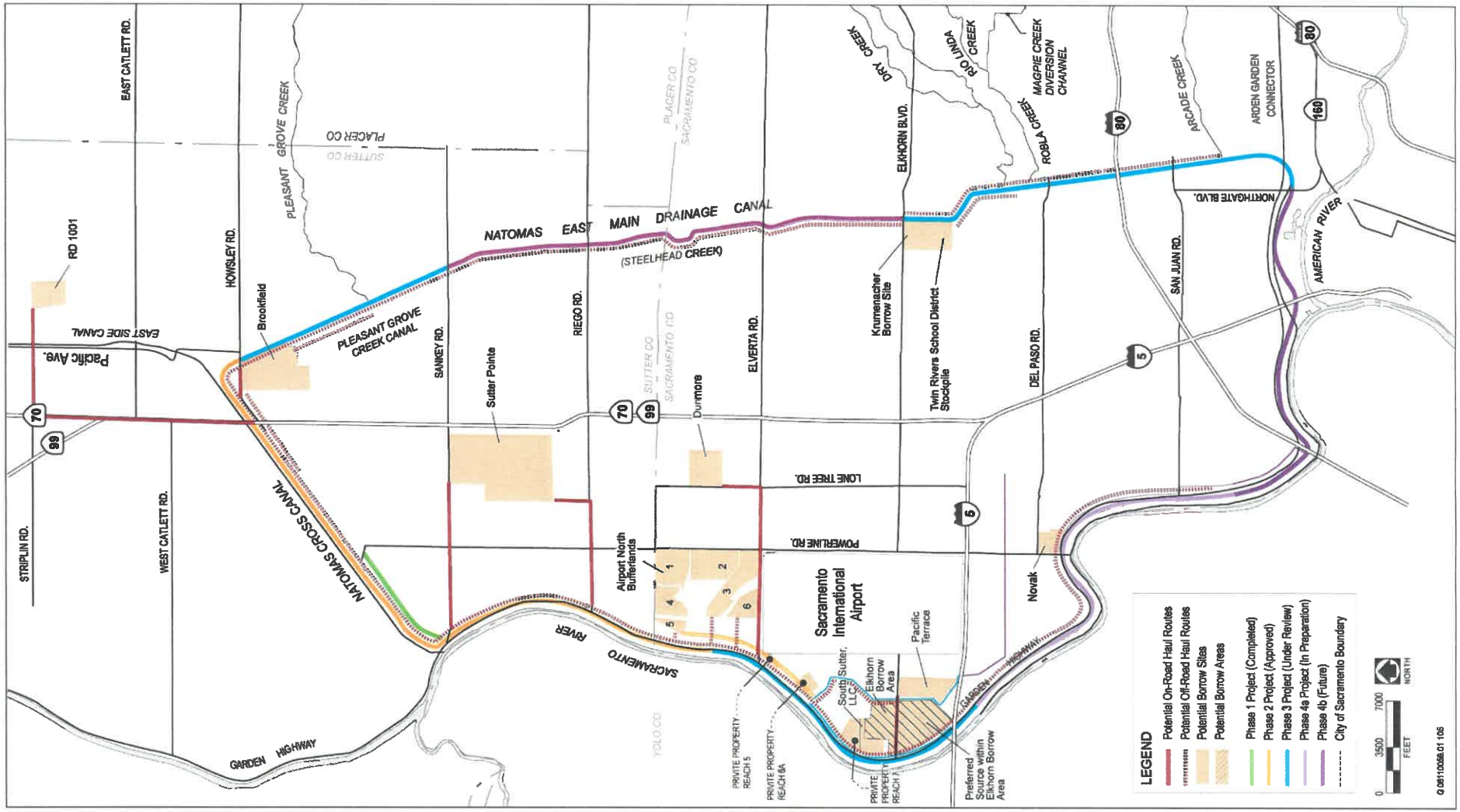
The Phase 2 Project as presented in the Phase 2 EIS differs from the Phase 2 Project as evaluated in the Phase 2 EIR for the following reasons. By the time the Phase 2 EIS began, SAFCA's engineering consultants had determined that cutoff walls could be used instead of berms along several of the Sacramento River east levee reaches. Thus, the Phase 2 EIS includes proposed cutoff walls in some Sacramento River east levee reaches and a discussion of the impacts of the cutoff walls on groundwater recharge. Additionally, it became clear during the EIS process that much of the 2008 construction phase (or Phase 2 Project) would actually have to be conducted in 2009. The Phase 2 EIS therefore acknowledges that possibly all of the Phase 2 Project construction could be concurrent with construction of the Phase 3 Project, and discusses the consequences to haul truck traffic, noise, air quality, and other construction-related effects accordingly. Also, the existing conditions at the Airport north bufferlands borrow sites changed from "active rice cultivation," to "idle" because the agricultural leases for these lands expired on December 31, 2007, changing the baseline in which impacts were measured against. These differences were considered in the Phase 2 SEIR (SAFCA 2009a), prepared by SAFCA, which was certified by the SAFCA Board of Directors in January 2009, at which time the Board also approved the modifications to the Phase 2 Project.

The Phase 2 Project could be constructed on a stand-alone basis, assuming no further action on the balance of the NLIP is taken. Construction is planned to begin in spring 2009 and is anticipated to be completed in 2009.

1.3.3 PHASE 3 PROJECT

The Phase 3 Project, which is the subject of this FEIR, focuses on addressing underseepage, riverbank erosion, encroachment, and levee height deficiencies along 4.5 miles of the Sacramento River east levee, 3.2 miles of the PGCC west levee, and 6.2 miles of the NEMDC west levee.

On February 13, 2009, USACE and SAFCA issued the Phase 3 DEIS/DEIR (USACE and SAFCA 2009) for public review and comment. SAFCA has prepared this FEIR to provide responses to comments on the DEIS/DEIR. Subsequently, the SAFCA Board of Directors will consider whether to approve the Phase 3 Project.



Source: Base map from CASIL Layers and SACOG 2007; adapted by EDAW in 2008 based on data from MBK Engineers

NLIP Construction Phasing and Anticipated Haul Routes from Soil Borrow Areas

Plate 2

As noted above, USACE will prepare a separate FEIS to provide responses to comments on the DEIS/DEIR in accordance with NEPA. Subsequently, USACE will consider whether to grant Section 408 permission and issue permits under Sections 404 and 10.

Construction of the Phase 3 Project is planned to begin in late summer/fall 2009 and is anticipated to be completed in 2010, assuming receipt of all required environmental clearances and permits. The potential exists for up to 30% of the Phase 2 Project to also be constructed in 2010, concurrent with Phase 3 and possibly Phase 4a Project construction. The Phase 4a Project is the subject of a separate EIS/EIR, except as discussed in the Phase 3 DEIS/DEIR cumulative impact analysis.

1.3.4 PHASE 4A PROJECT

The Phase 4 Project was divided into three sub-phases (Phase 4a, 4b, and 4c) to provide the flexibility to construct Phase 4 over more than one construction season. Each of the sub-phases has its own independent utility, can be accomplished with or without the other sub-phases, and provides additional flood risk reduction benefits to the Natomas Basin whether implemented individually or collectively.

The Phase 4a Project includes levee raising and seepage remediation along the Sacramento River east levee (Reaches 10–15) and the NCC south levee. If permitted, these improvements could be constructed at the same time as portions of the Phase 2 and 3 Projects. The environmental impacts of these improvements were evaluated at a program level in the Local Funding EIR, Phase 2 EIR, and Phase 2 EIS. The project-specific impacts of the Phase 4a Project are being evaluated in a separate, project-specific EIS/EIR anticipated to be released to the public in summer 2009. Construction is planned to begin in early 2010 and be completed in 2011, assuming receipt of all required environmental clearances and permits.

1.3.5 PHASE 4B PROJECT

The Phase 4b Project will include seepage remediation along the Sacramento River east levee (Reaches 16–20) and the American River north levee (Reaches 1–4); levee raising and widening, slope flattening, and seepage remediation along the NEMDC west levee (from Sankey Road to Elkhorn Boulevard); and improvements to the West Drainage Canal south of Interstate 5. The environmental impacts of these improvements were evaluated at a program level in the Local Funding EIR, Phase 2 EIR, and Phase 2 EIS. The project-specific impacts of the Phase 4b Project will be evaluated in a separate, project-specific EIS/EIR and released to the public in late 2009/early 2010. Construction is planned to begin and be completed in 2011, assuming receipt of all required environmental clearances and permits.

1.3.6 PHASE 4C PROJECT

The Phase 4c Project will include improvements to achieve "200-year" flood protection along the American River north levee (Reaches 1–4), PGCC west levee, and NEMDC west levee. The environmental impacts of these improvements were evaluated at a program level in the Local Funding EIR, Phase 2 EIR, and Phase 2 EIS. The project-specific impacts of the Phase 4c Project will be evaluated in a separate, project-specific EIS/EIR in 2010. Construction is planned to begin and be completed in 2012, assuming receipt of all required environmental clearances and permits.

1.4 PROJECT PURPOSE/PROJECT OBJECTIVES

SAFCA's project objectives adopted in connection with the NLIP are: (1) provide at least a 100-year level of flood risk reduction to the Natomas Basin as quickly as possible, (2) provide "200-year" flood risk reduction to the Basin over time, and (3) avoid any substantial increase in expected annual damages as new development occurs in the Basin. The first two project objectives would reduce the residual risk of flooding sufficiently to meet

the minimum requirements of Federal and state law for urban areas like the Natomas Basin. The third project objective is a long-term objective of SAFCA's.

Additional project objectives that have informed SAFCA's project design are to:

(1) use flood damage reduction projects in the vicinity of the Airport to facilitate management of Airport lands in accordance with the Airport's *Wildlife Hazard Management Plan* (SCAS 2007); and

(2) use flood damage reduction projects to increase the extent and connectivity of the lands in the Natomas Basin being managed to provide habitat for giant garter snake, Swainson's hawk, and other special-status species.

SAFCA's approach to defining flood risk reduction accomplishments level of protection (system performance) differs from that of USACE. References in this document to levels of flood protection are based on SAFCA's "best estimate" approach (FEMA's and the state's current method) and should not be taken as USACE concurrence that such levels would be achieved based on USACE's approach of incorporating risk and uncertainty in the estimate of system performance. In any case, flood risk to the Natomas Basin would be considerably reduced by the project.

1.5 SUMMARY DESCRIPTION OF THE PHASE 3 PROJECT

The Phase 3 Project focuses on underseepage, stability, erosion, encroachment, and levee height deficiencies along 4.5 miles of the Sacramento River east levee, 3.2 miles of the PGCC west levee, and 6.2 miles of the NEMDC west levee. If permitted, these improvements could expect to be constructed in concert with portions of the Phase 2 Project. Construction of the Phase 3 Project is scheduled to begin in late summer/fall 2009 and is expected to be completed in 2010, assuming receipt of all required environmental clearances, permits, and approvals for project implementation. **Plates 3a, 3b**, and **3c** provide an overview of the elements of the Proposed Action, which include:

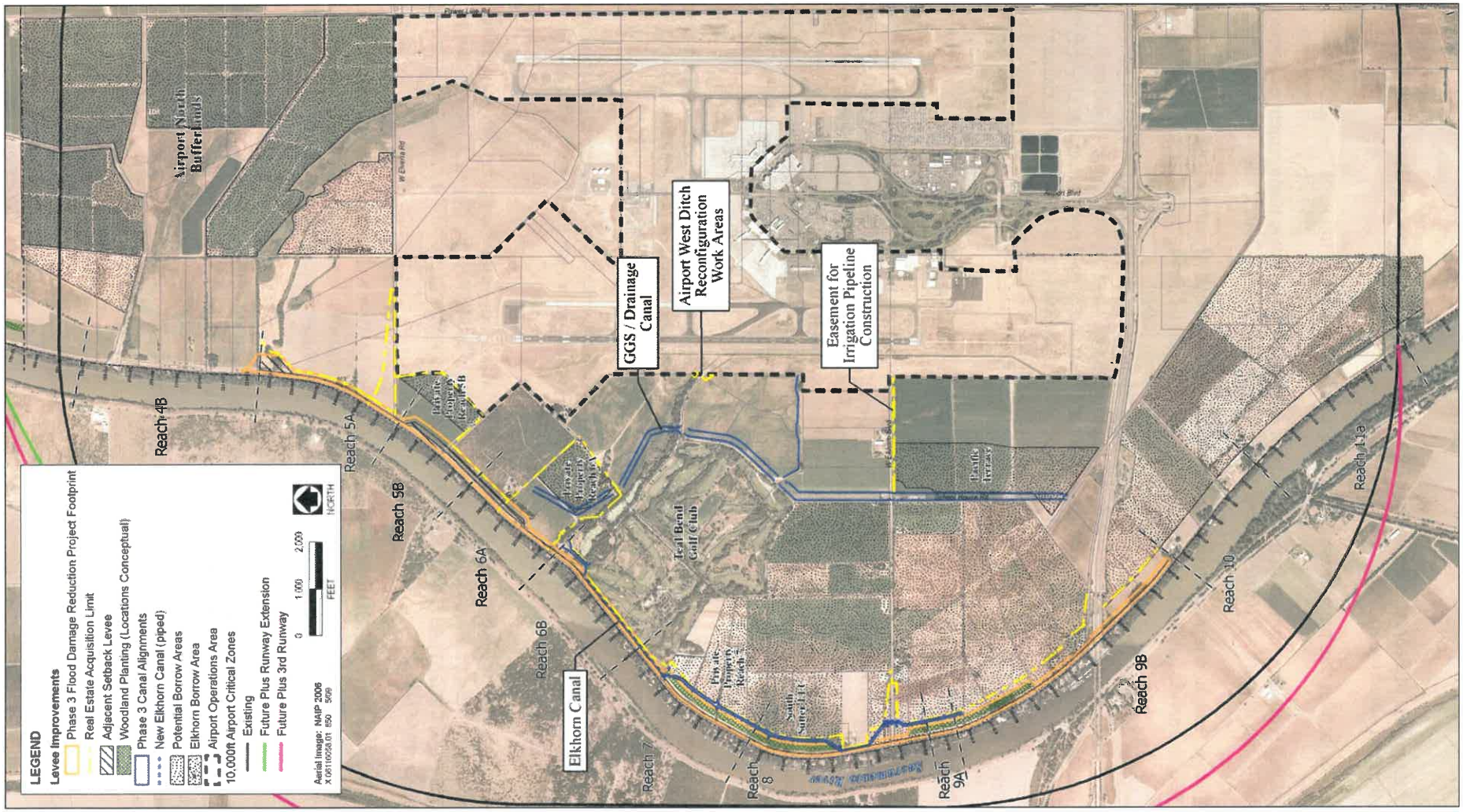
- **Sacramento River east levee Reaches 5A–9B: Levee raising and seepage remediation**—Construct a raised adjacent setback levee from just north of Elverta Road to just south of I-5 (Reaches 5A–9B) with cutoff walls, seepage berms, and relief wells where required to reduce seepage potential.

- **PGCC west levee: Levee raising, slope flattening, and widening; and seepage remediation**—Raise the existing levee between Howsley Road and Sankey Road, flatten and widen the levee slopes, and construct cutoff walls or seepage berms to reduce seepage potential.

- **NEMDC west levee from Elkhorn Boulevard to NEMDC Stormwater Pumping Station: Levee widening and flattening and seepage remediation**—Widen and flatten the slopes of the existing levee between Elkhorn Boulevard and the NEMDC Stormwater Pumping Station and construct a cutoff wall to reduce seepage potential.

- **NEMDC west levee from NEMDC Stormwater Pumping Station to Northgate Boulevard: Seepage and slope stability remediation**—Construct a cutoff wall in the existing levee and/or reconstruct portions of the levee from the NEMDC Stormwater Pumping Station to Northgate Boulevard where required to reduce seepage potential and slope instability.

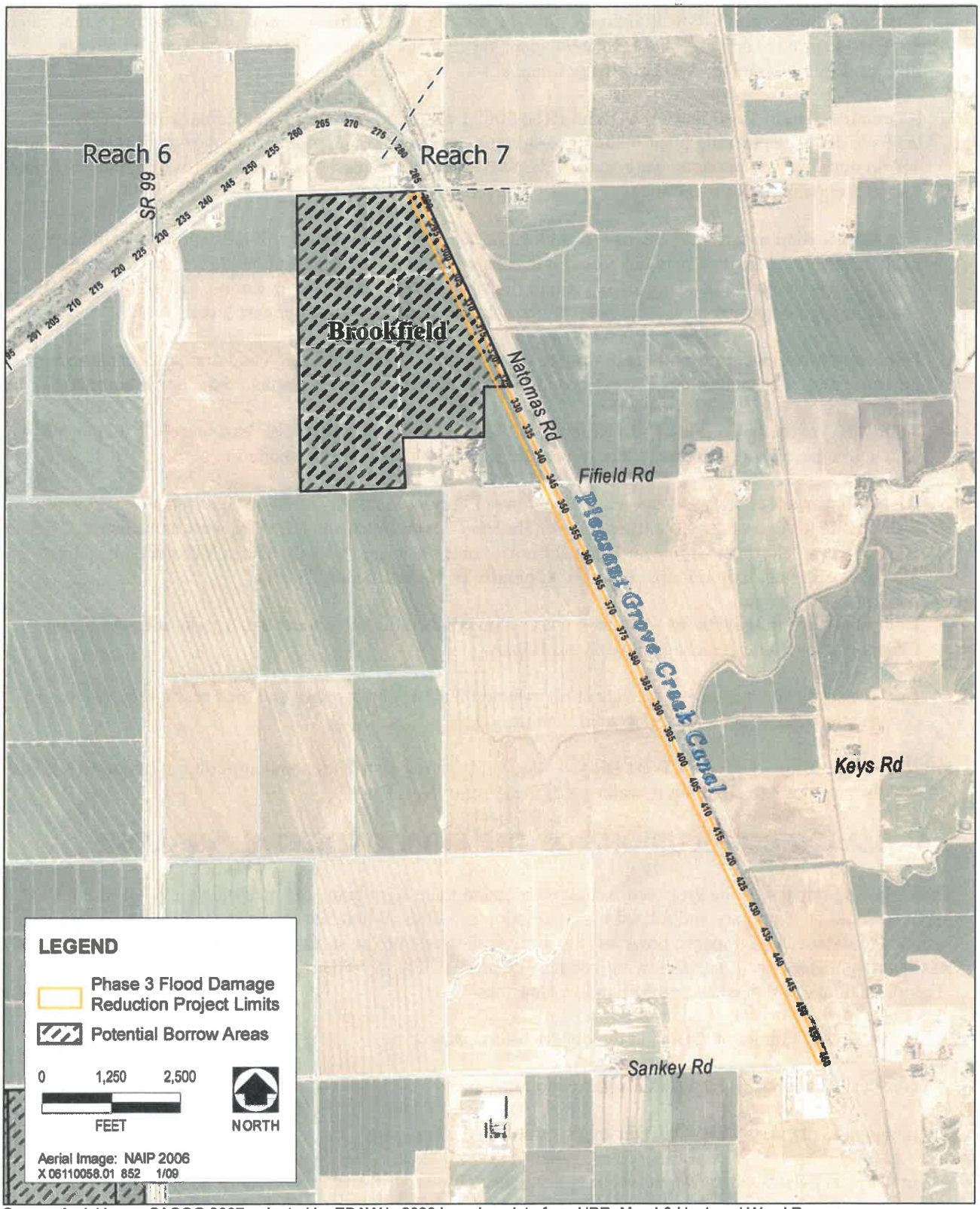
- **Relocation of approximately 9,400 feet of the Elkhorn Canal (highline irrigation canal) downstream of Elkhorn Reservoir**—Pipe the canal between the new adjacent setback levee and Teal Bend Golf Club in Reaches 6B and 7, and in an area adjacent to the landside residential properties in Reach 8; and reconstruct the canal parallel to the adjacent setback levee at a distance of approximately 200 feet from the levee in Reaches 7–9A.



Source: Aerial image SACOG 2007; adapted by EDAW in 2008 based on data from HDR, Mead & Hunt, and Wood Rogers

Overview of Proposed Project Features: Sacramento River East Levee

Plate 3a



Source: Aerial image SACOG 2007; adapted by EDAW in 2008 based on data from HDR, Mead & Hunt, and Wood Rogers

Overview of Proposed Project Features: Pleasant Grove Creek Canal **Plate 3b**

- **Construction of a new GGS/Drainage Canal downstream of Elkhorn Reservoir**—Construct a new canal designed to provide drainage and associated giant garter snake habitat (GGS/Drainage Canal) between Elkhorn Reservoir and the West Drainage Canal at I-5.

- **Reconstruction of Reclamation District (RD) 1000 Pumping Plant No. 2**—Reconstruct the existing landside drainage pumping plant with intake structure, a pump station, piping over the adjacent setback levee, and an outfall structure on the water side of the Sacramento River east levee; and improve the intake channel east of the pumping plant entrance.

- **Habitat creation and management**—Establish the new drainage canal to provide connectivity of aquatic habitat; establish perennial native grasses on levee slopes, seepage berms, and operation and maintenance areas; recontour the land and preserve rice and field crop habitat at borrow locations; and establish woodlands consisting of native riparian species at locations along the Sacramento River east levee.

- **Infrastructure relocation and realignment**—Realign and relocate irrigation and drainage canals and other infrastructure, such as utility poles, as needed to accommodate the flood damage reduction measures.

- **Landside Vegetation removal**—In Reaches 10–12A of the Sacramento River east levee, clear landside vegetation in a 670-foot-wide corridor to prepare for future flood damage reduction work.

- **Right-of-way acquisition**—Land within the Phase 3 Project footprint would be acquired along the Sacramento River east levee Reaches 5A–9B, the PGCC west levee, the NEMDC west levee between Elkhorn Boulevard and Northgate Boulevard, and at borrow sites associated with the Phase 3 Project. The parcels in the Phase 3 Project footprint are shown in **Appendix H**, "Construction Details."

- **Encroachment management**—Remove encroachments as required to meet the criteria of USACE, the Central Valley Flood Protection Board, and FEMA.

- **Borrow sites reclamation**—Excavate earthen material at the borrow sites and then return the sites to post-construction uses or suitable replacement habitat.

- **Reconfiguration of Airport West Ditch**—Modify irrigation distribution and agricultural drainage systems and infrastructure to allow for dewatering of the Airport West Ditch.

1.6 MAJOR CONCLUSIONS OF THE ENVIRONMENTAL ANALYSIS

The following impacts of the Proposed Action were found to be significant and unavoidable. Most of these impacts would be temporary and related to construction activities. Where feasible mitigation exists, it has been included to reduce these impacts; however, the mitigation would not be sufficient to fully reduce the impacts to a less-than-significant level. The following impacts are presented in the order they appear in Chapter 4.0, "Environmental Consequences and Mitigation Measures."

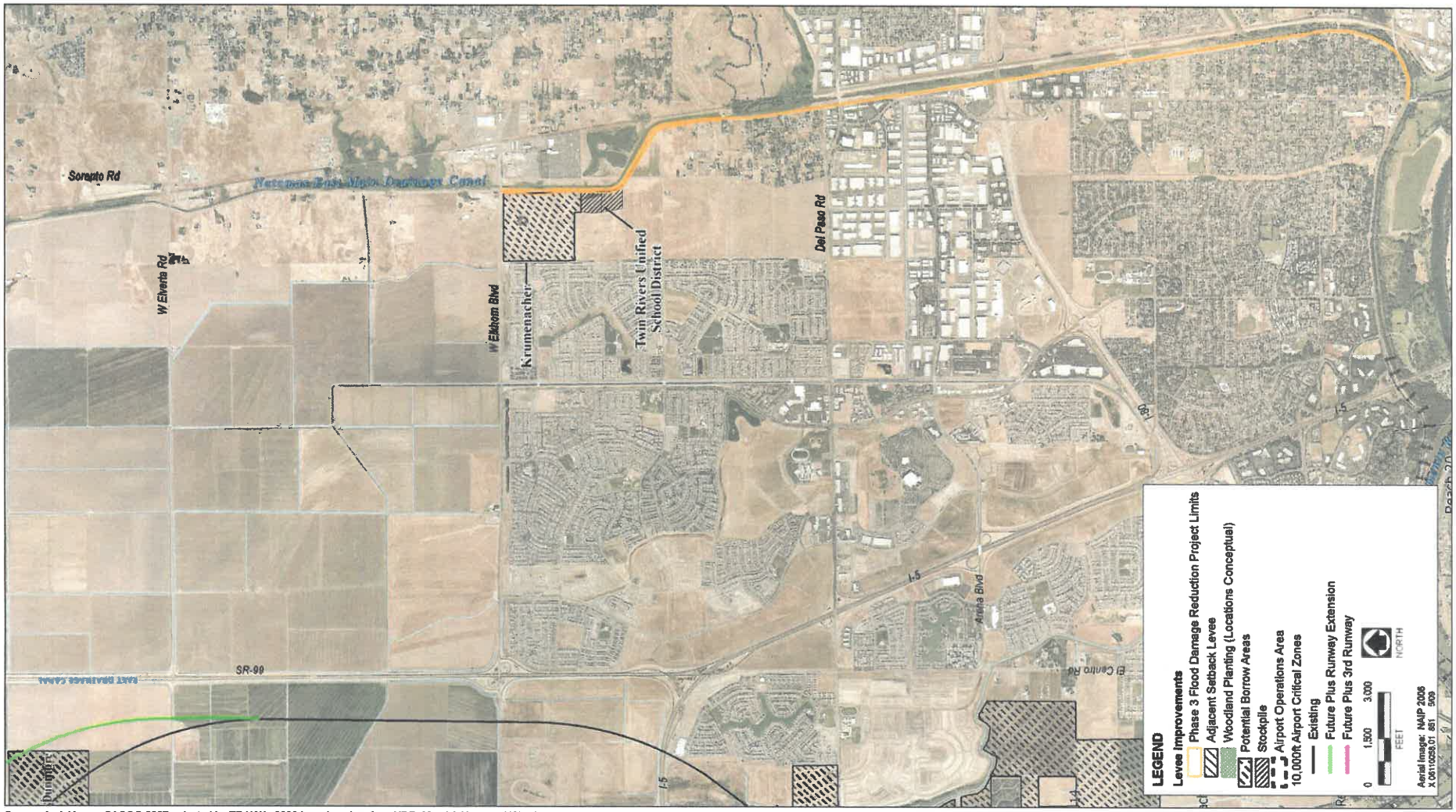
- conversion of Important Farmland to nonagricultural uses;

- conflicts with lands under Williamson Act contracts;

- potential to physically divide or disrupt an established community;

- impacts on Swainson's hawk and other special-status birds;

- potential damage or disturbance to known prehistoric resources from ground-disturbance or other construction-related activities;



Source: Aerial image SACOG 2007; adapted by EDAW in 2008 based on data from HDR, Mead & Hunt, and Wood Rogers

Overview of Proposed Project Features: Natomas East Main Drainage Canal

Plate 3c

- potential damage to or destruction of previously undiscovered cultural resources from ground-disturbance or other construction-related activities;
- potential discovery of human remains during construction;
- temporary increase in traffic on local roadways;
- temporary emissions of ROG, NO_X, and PM_{10} during construction;
- generation of temporary, short-term construction noise;
- exposure of sensitive receptors to or generation of excessive groundborne vibration;
- temporary, short-term exposure of residents to increased traffic noise levels from hauling activity;
- alteration of scenic vistas, scenic resources, and existing visual character of the project area; and
- new sources of light and glare that adversely affect views.

1.7 REQUIREMENTS FOR DOCUMENT CERTIFICATION AND FUTURE STEPS IN PROJECT APPROVAL

On February 13, 2009, USACE and SAFCA released the Phase 3 DEIS/DEIR for a public review and comment period that ended April 6, 2009. The DEIS/DEIR was submitted to the State Clearinghouse for distribution to reviewing agencies. A notice of availability was published in the *Sacramento Bee* and distributed to a broad mailing list.

A public hearing to receive comments on the DEIS/DEIR was held at the Sacramento County Board of Supervisors Chambers on March 19, 2009 during the regular meeting of the SAFCA Board of Directors. The public hearing was recorded and a transcript was prepared.

As a result of these notification efforts, written and verbal comments were received from Federal, state, and local agencies; organizations; and individuals on the content of the DEIS/DEIR. Chapter 2.0, "Responses to Comments on the DEIS/DEIR," identifies these commenting parties, their respective comments, and responses to these comments. None of the comments received, or the responses provided, constitute "significant new information" by CEQA standards (State CEQA Guidelines Section 15088.5).

SAFCA will hold a public hearing as part of its Board of Directors meeting on May 21, 2009, to consider certification of the EIR and to decide whether to approve the Phase 3 Project, at which time the public and interested agencies may comment on the project.

1.8 ORGANIZATION AND FORMAT OF THIS DOCUMENT

This document is organized as follows:

Chapter 1.0, "Introduction," presents a summary of the Proposed Action, summarizes the major conclusions of the DEIS/DEIR, describes the purpose of the FEIR, provides an overview of the environmental review process, and describes the content of the FEIR.

Chapter 2.0, "Changes to the Phase 3 Project and Master Responses to Comments on the DEIS/DEIR," presents minor modifications to the Phase 3 Project since release of the Phase 3 DEIS/DEIR and responses to

environmental issues raised in multiple comments (termed "master responses") that are organized by topic to provide more comprehensive responses than may be possible in responding to individual comments.

Chapter 3.0, "Individual Responses to Comments on the DEIS/DEIR," contains a list of all parties who submitted comments on the DEIS/DEIR during the public review period, copies of the comment letters received, a copy of the transcript from the May 19 public meeting, and individual responses to the comments.

Chapter 4.0, "Revisions to the DEIS/DEIR," presents revisions to the DEIS/DEIR text made in response to comments, or to amplify, clarify or make minor modifications or corrections. Changes in the text are signified by ~~strikeouts~~ where text is removed and by <u>underline</u> where text is added.

Chapter 5.0, "References," includes the references to documents used to support the comment responses.

Chapter 6.0, "List of Preparers," lists the individuals who assisted in the preparation of this document.

2.0 CHANGES TO THE PHASE 3 PROJECT AND MASTER RESPONSES TO COMMENTS ON THE DEIS/DEIR

2.1 CHANGES TO THE PHASE 3 PROJECT

CEQA requires recirculation of an EIR when the lead agency makes substantial changes to the project description or environmental setting. For a change to be considered substantial it must deprive the public of the opportunity to comment on significant new information, including a new significant impact in which no feasible mitigation is available to fully mitigate the impact (thus resulting in a significant and unavoidable impact), a substantial increase in the severity of a disclosed environmental impact, or development of a new feasible alternative or mitigation measures that would clearly lessen environmental impacts but which the project proponent declines to adopt (State CEQA Guidelines Section 15088.5[a]), or inclusion of a new mitigation measure which would create a new significant impact on the environment). Recirculation is not required where the new information added to the EIR merely clarifies or amplifies or makes insignificant modifications in an adequate EIR (State CEQA Guidelines Section 15088.5[b]).

Since release of the DEIS/DEIR, SAFCA has continued to refine the features of the Phase 3 Project. As a result of these efforts, the Phase 3 Project has undergone minor modifications that are identified in the following discussion. These modifications would not substantially increase the severity of an impact or create a new significant impact, as discussed further below.

2.1.1 FLOOD DAMAGE REDUCTION AND CANAL COMPONENTS

Proposed project modifications related to construction and operation of the flood damage reduction and canal components include the following:

- **Addition of New Potential Off-Road Haul Route East of Teal Bend Golf Club.** A new potential haul route would be established in the alignment of the proposed GGS/Drainage Canal to allow soil borrow material to be transported from the Airport north bufferlands to Reaches 8–9B of the Sacramento River east levee (**Plate 2**). The route, which would be decommissioned prior to construction of the GGS/Drainage Canal, would help support use of the Airport north bufferlands as the primary source of soil borrow material for the Phase 3 Project. The route would also provide an alternative to the haul route west of Teal Bend Golf Club for transporting material to Reaches 7–8, potentially reducing haul truck traffic in that area. This route would connect to the landside haul route in Reach 6A in the north and to the Elkhorn Boulevard on-road haul route in the south. Because this potential haul route would be established in the footprint of the proposed GGS/Drainage Canal, impacts from ground disturbance were analyzed and addressed in the Phase 3 DEIS/DEIR. The route would be slightly longer than the haul route west of the Teal Bend Golf Club but within the overall haul distance assumptions used for air quality modeling. Potential impacts resulting from the use of this new haul route would be similar to those already evaluated in the Phase 3 DEIS/DEIR for the other potential haul routes. These changes do not constitute significant new information that would require recirculation of the document because no new significant or substantially more severe environmental impacts have been identified.

- **Preliminary Selection of Borrow Sites within the Elkhorn Borrow Area.** SAFCA has narrowed the focus of its planning for the Elkhorn Borrow Area, identifying the area south of Elkhorn Boulevard, north of Interstate 5 (I-5), and west of Schoolhouse Road as the preferred source for borrow material needed for the Phase 3 Project that would not be supplied by the Airport north bufferlands (**Plate 2**). This area is preferred to the portion of the Elkhorn Borrow Area north of Elkhorn Boulevard because of its proximity to Reaches 9A and 9B of the Sacramento River east levee and because geotechnical investigations indicate that it could more easily be returned to agricultural production following borrow operations. This area would be graded upon

reclamation to drain to the east and west, and the reclaimed depth would be as shallow as possible to maintain maximum production potential for field crops. Borrow activities are expected to occur for 2 years. The Elkhorn Borrow Area was identified in Chapter 2.0, "Alternatives," in the Phase 3 DEIS/DEIR as an area where borrow may be taken; however, specific parcels were still being evaluated at the time the Phase 3 DEIS/DEIR was released for public review. Environmental commitments were set forth, which would apply to the future selection and use of borrow sites and were incorporated into the mitigation measures applicable to borrow sites (see Section 2.3.8.4, "Borrow Site Program," in the Phase 3 DEIS/DEIR). Impacts and mitigation measures associated with the use of borrow sites were described in Chapter 4.0, "Environmental Consequences and Mitigation Measures," in the Phase 3 DEIS/DEIR and would apply to any parcels ultimately selected within the narrowed focus of the Elkhorn Borrow Area. These changes do not constitute significant new information that would require recirculation of the document because no new significant or substantially more severe environmental impacts have been identified.

- **Design Refinements in Reach 5A.** Estimates of impacts to waters of the United States (Impact 4.7-a, "Impacts on Jurisdictional Waters of the United States") have been revised based on refinements in the levee design in Reach 5A of the Sacramento River east levee. The alignment of the approach ramp for the reconstructed intersection of Elverta Road at Garden Highway, which is required for construction of the proposed adjacent setback levee, would permanently disturb an additional 1.65 acres of waters of the United States. In addition, during elevated Sacramento River stages, a cutoff wall proposed for Reach 5A could potentially reduce the contribution of groundwater to up to 4.22 acres of jurisdictional wetlands north of the Elverta Road ramp, which may reduce the function of these wetlands. The estimate of 4.22 acres is worst case because the extent of this indirect impact would depend upon local soil conditions and how sensitive the wetland is to changes in groundwater levels. These changes would increase the total minimum estimated impact from 22.17 acres to approximately 28.04 acres and the total maximum estimated impact to waters of the United States from 27.17 acres to approximately 33.04 acres. Table 4.7-1 has been revised to reflect these changes (see Chapter 4.0, "Revisions to the DEIS/DEIR," in this FEIR). These modifications to the estimate of impacts on jurisdictional waters (Impact 4.7-a) would not result in an impact not previously identified or a substantial increase in the severity of the previously identified impact. Mitigation Measure 4.7-a, "Minimize Effects on Jurisdictional Waters of the United States, Complete Detailed Design of Habitat Creation Components and Secure Management Agreements to Ensure Compensation of Waters Filled, and Comply with Section 404, Section 401, Section 10, and Section 1602, Permit Processes," would be implemented to reduce this impact to a less-than-significant level. Thus, these changes do not constitute significant new information that would require recirculation of the document because no new significant or substantially more severe environmental impacts have been identified.

- **Acquisition of Additional Land in Reach 9B.** To prevent future land uses that could be incompatible with flood damage reduction improvements, SAFCA would acquire additional land in Reach 9B of the Sacramento River east levee to maintain a 450-foot-wide buffer area from the centerline of Garden Highway. These acquisitions are shown on Plate 3a as the areas in Reach 9B between the flood damage reduction footprint and the real estate acquisition limit. This additional acquisition would affect portions of Assessor Parcel Numbers (APNs) 201-0280-013, 201-0280-006, 201-0280-037, 201-0280-062, 201-0280-045, 201-0330-043, and 201-0330-042; the Phase 3 DEIS/DEIR identified these parcels as either within the footprint of the proposed levee improvements or as potential borrow sites. **Plate H-1b** has been revised to show the new real estate acquisition limit in relation to parcels (see Chapter 4.0, "Revisions to the DEIS/DEIR," in this FEIR). No construction of project improvements would occur within this buffer area, which would remain in its current agricultural use. Therefore, no physical changes that would result in new or increased significant environmental impacts would occur from the land acquisition. These changes do not constitute significant new information that would require recirculation of the document because no new or substantially more severe significant environmental impacts have been identified.

- **Increase in PGCC West Levee Real Estate Acquisition Limit.** The real estate acquisition limit for the PGCC west levee has been extended landward by five feet between Stations 325+40 and 461+31 to provide additional space for the utility corridor. This additional area would be approximately 1.8 acres and would result in a slight increase in the conversion of Important Farmland to nonagricultural uses, with a small increase in impacts to giant garter snake habitat, Swainson's hawk foraging habitat, and jurisdictional waters of the United States. These incremental changes would not result in a substantial increase in the severity of environmental impacts identified for these resources. The following previously identified mitigation measures would be implemented to reduce these impacts to a less-than-significant level: Mitigation Measures 4.1-a, "Conversion of Important Farmland to Nonagricultural Uses," 4.7-a, "Impacts on Jurisdictional Waters of the United States," 4.9-c, "Impacts on Giant Garter Snake Related to Construction Activities," and 4.9-f, "Impacts on Swainson's Hawk and Other Special-Status Birds." Thus, these changes do not constitute significant new information that would require recirculation of the document because no new significant or substantially more severe environmental impacts have been identified.

- **Use of Existing O&M Road on the Waterside of NEMDC West Levee.** An existing dirt road currently used for levee maintenance purposes is located on the waterside of the NEMDC west levee. The road would be used for staging, stockpiling, and potentially for hauling materials for installation of the cutoff wall south of Elkhorn Boulevard. The route, which is shown on **Plate 2**, would not increase the number of haul trips required for construction along the NEMDC west levee. Mitigation Measure 4.13-a, "Implement Applicable District-Recommended Control Measures to Minimize Temporary Emissions of ROG, NO_X, and PM_{10} during Construction," would be applied to minimize emissions of PM_{10} from truck traffic on the road. Mitigation Measure 4.5-a, "Implement Standard Best Management Practices, Prepare and Implement a Stormwater Pollution Prevention Plan, and Comply with National Pollutant Discharge Elimination System Permit Conditions," would be applied to prevent the release of construction-related materials into the NEMDC. Thus, these changes do not constitute significant new information that would require recirculation of the document because no new significant or substantially more severe environmental impacts have been.

2.1.2 Clarifications to Proposed Management of Fisheries and Aquatic Resources

The California Department of Fish and Game (DFG) expressed concern in its comment letter (S5) on the Phase 3 DEIS/DEIR that mitigation measures for fisheries and aquatic resources did not have adequate performance standards that ensure mitigation measures would be enforced and that impacts would be reduced to a less-than-significant level. As a result, SAFCA has provided the following clarifications to the Phase 3 Project.

- The National Marine Fisheries Service (NMFS) is now included with the U.S. Fish and Wildlife Service (USFWS) and DFG for consultation to develop performance standards to determine if the woodlands conservation component can be considered successful during a particular monitoring year and at the end of the established period.

- Additional detail has been added regarding the timing of cofferdam and dewatering activities for Reclamation District (RD) 1000 Pumping Plant No. 2 outfall reconstruction. Construction of the cofferdam and dewatering would occur during an in-water work window when sensitive fish species are least likely to be present. To protect fish habitat, sheet pile installation operational controls and a fish rescue plan shall be implemented during cofferdam construction.

- The demolition and removal of intake pipes associated with Prichard and Elkhorn Pumping Plants is part of the American Basin Fish Screen and Habitat Improvement Project (ABFS). Construction of the Phase 3 Project associated with the Prichard and Elkhorn Pumping Plant is dependent on the timing of the ABFS project implementation.

- If construction of the ABFS project is completed first, the demolition of the plants would be completed and the pipes through the levee would be removed as needed.

- If the ABFS project is not completed first, the cutoff wall would be installed, the Sacramento River east levee would be raised, the pipes would be raised, and the pumps and motors modified so that that these plants could continue to operate. After the ABFS project is constructed and operational, the pipes and pumps would be removed.

- Construction-related disturbances to fish are now clarified in Impact 4.6-a, "Loss of Fish or Aquatic Habitat through Increased Sediment and Turbidity, Releases of Contaminants, or Other Construction-Related Disturbances," (note that the final clause has been added since release of the Phase 3 DEIS/DEIR). As a result, Mitigation Measure 4.6-a, "Implement Mitigation Measure 4.5-a, 'Implement Standard Best Management Practices, Prepare and Implement a Stormwater Pollution Prevention Plan, and Comply with National Pollutant Discharge Elimination System Permit Conditions'; and Mitigation Measure 4.5-c, 'Implement Best Management Practices and Comply with NPDES Permit Conditions for a Point-Source Discharge'," has been expanded, and now includes, "Implement a Feasible Construction Work Window that Minimizes Impacts to Special-Status Fish Species for Any In-Water Activities; and "Implement Operational Controls and a Fish Rescue Plan that Minimizes Impacts to Fish Associated with Cofferdam Construction and Dewatering," has been modified to include this clarification.

- Additions to Mitigation Measure 4.6-b, "Restore, Replace, or Rehabilitate Degraded SRA Habitat Function and Comply with Section 7 of the Federal Endangered Species Act, Section 1602 of the California Fish and Game Code, and Section 2081 of the California Endangered Species Act Permit Conditions," have been made, including measures to reduce disturbance to SRA habitat during construction activities; details regarding restoration, monitoring, and performance criteria; and a discussion regarding long-term management goals.

Text changes are included in Chapter 4.0, "Revisions to the DEIS/DEIR," of this FEIR to provide clarification to the project description and environmental consequences associated with implementation of the Phase 3 Project. There are no new significant environment impacts, no substantial increase in severity of a previously disclosed impacts, or additional project alternatives or new feasible mitigation measures that the project proponent declines to adopt. This information is provided to clarify and amplify details included in the Phase 3 DEIS/DEIR.

2.1.3 Design Refinements of the New GGS/Drainage Canal

The southern end of the GGS/Drainage Canal alignment would be shifted eastward to flow directly south into the West Drainage Canal rather than bending southwest (**Plate 3a**). This realignment would not change the extent of ground disturbance and therefore would not increase impacts to Important Farmland, undiscovered cultural resources, or sensitive habitat that were identified in the Phase 3 DEIS/DEIR. The GGS/Drainage Canal alignment north of Jacobs Slough would be straightened, extending farther north from the previously identified alignment but within the proposed limit of real estate acquisition. The canal would cross Walnut Road in the same general location. The realignment would improve canal hydraulics and provide an upland habitat buffer area for giant garter snake on both sides of the canal. Although this realignment would not increase the footprint of the GGS/Drainage Canal, it could reduce the potential to farm a small area of land south of the modified alignment because it would split southern portion of the affected parcel further to the north rather than staying close to Jacobs Slough. This modification would not result in a substantial increase in the severity of environmental impacts identified in the Phase 3 DEIS/DEIR. These changes do not constitute significant new information that would require recirculation of the document because no new significant environmental impacts have been identified.

Since release of the Phase 3 DEIS/DEIR and as a result of ongoing consultation with the Federal Aviation Administration (FAA) and the Sacramento County Airport System (SCAS), SAFCA has determined that 10 acres of planned marsh habitat associated with the new GGS/Drainage Canal is not appropriate because the new GGS/ Drainage Canal would be located within 10,000 feet of the runways of the Sacramento International Airport (Airport) (i.e., within the Airport Critical Zone) and marsh habitat would potentially attract wildlife considered hazardous to Airport operations. In addition, the marsh would conflict with a Memorandum of Agreement between the FAA, U.S. Air Force, U.S. Army, U.S. Environmental Protection agency (EPA), USFWS, and the U.S. Department of Agriculture that addresses existing and future environmental conditions contributing to aircraft-wildlife collision (FAA 2003). Therefore, SAFCA determined that the planned 10 acres of marsh associated with the new GGS/Drainage Canal could result in a hazard to public safety.

The GGS/Drainage Canal design would remain largely the same as described in the Phase 3 DEIS/DEIR, except that bench areas associated with the canal would not contain a maintained water depth of 3–12 inches (i.e., marsh habitat), as described in Appendix H of the Phase 3 DEIS/DEIR. The bench would instead graded to a slightly higher elevation and would be planted with perennial grasses, periodically irrigated with water, and maintained as giant garter snake upland habitat. This design refinement would not substantially alter Impact 4.9-c, "Impacts on Giant Garter Snake Related to Project Construction Activities," because the new GGS/Drainage Canal would still remain a functional travel corridor between giant garter snake concentrations in the northwestern and southern portions of the Natomas Basin. The only change would be the elimination of 10 acres of marsh and the addition of 10 acres of uplands, bringing the total created uplands to 32 acres. The significance conclusion would remain potentially significant and Mitigation Measure 4.9-c, "Minimize the Potential for Direct Loss of Giant Garter Snake Individuals, Develop Detailed Design of Managed Marsh and New Canals and Management Agreements to Ensure Adequate Compensation for Loss of Habitat, Implement all Management Agreements, and Obtain Incidental Take Authorization," would reduce this impact to a less- than -significant level, as stated in the Phase 3 DEIS/DEIR.

Impact 4.19-b, "Potential for Higher Frequency of Collisions between Aircraft and Wildlife at Sacramento International Airport," in the Phase 3 DEIS/DEIR was determined to be less than significant because construction of the GGS/Drainage Canal would allow for dewatering of the Airport's West Ditch, an aquatic habitat identified by FAA and SCAS as a hazardous wildlife attractant. However, marsh is considered to be a hazardous wildlife attractant and implementation of the 10-acre marsh habitat within the GGS/Drainage Canal would pose a public safety risk. Because the elimination of the 10 planned acres of marsh would further reduce potential hazardous wildlife attractants, this impact would remain less than significant, as stated in the Phase 3 DEIS/DEIR.

Text changes related to the GGS/Drainage Canal design refinements are presented in Chapter 4.0, "Revisions to the DEIS/DEIR," of this FEIR. These changes clarify the project description and potential environmental impacts of the Phase 3 Project; they do not constitute significant new information. This design refinement would not result in a substantial increase in the severity of environmental impacts identified in the Phase 3 DEIS/DEIR; no new significant environmental impacts, or project alternatives or new mitigation measures that the project proponent declines to adopt.

2.2 MASTER RESPONSES TO COMMENTS ON THE DEIS/DEIR

The following discussion presents responses to environmental issues raised in multiple comments. These responses have been titled, "master responses," because they address numerous comments concerning the same or very similar topics. These responses are organized by topic to provide a more comprehensive response than may be possible in responding to individual comments.

All individual comments on environmental issues along with individual responses to these comments are presented in Chapter 3.0, "Individual Responses to Comments on the DEIS/DEIR." In that chapter, the reader is referred back to these master responses as appropriate.

2.2.1 MASTER RESPONSE: GROUNDWATER HYDROLOGY IN THE VICINITY OF THE NEMDC

In response to several comments received on the Phase 3 DEIS/DEIR, SAFCA has prepared the following response regarding groundwater hydrology. Commenters expressed concern that water levels and water quality of domestic wells, specifically near the Valley View Acres neighborhood, would be adversely affected as a result of cutoff wall construction.

The *Evaluation of Potential Groundwater Impacts Due to Proposed Construction for Natomas Levee Improvement Program*, prepared by Luhdorff & Scalmanini, Consulting Engineers (LSCE), has been updated to include additional information and analysis on the potential effects of cutoff walls along the NEMDC on domestic and agricultural wells in the VVA community. The updated report (**Appendix A**) also includes a revised version of Figure 8-1, "Wells In and Near the Natomas Basin," which has been updated to show estimated locations of private wells in the VVA community. Because mapping of these wells is ongoing, and well numbers have not yet been assigned, these estimated locations are based on the locations of existing residential parcels.

The VVA community includes about 150 residences situated on about 300 acres of land west of the NEMDC. The community is primarily supplied by groundwater, and each residence is assumed to have a domestic well. In addition, several of the larger parcels are anticipated to have agricultural wells. Compilation of construction information for these wells is still in progress, but drillers' logs were available for 27 VVA wells. These wells range in depth from 65 to 290 feet below ground surface (-35 to 260 feet NAVD88), with an average depth of 122 feet. Most of the drillers' logs do not show the perforated interval (the level at which groundwater is drawn into the well), but the depth of the perforated interval for almost all wells is expected to be below the depth of the cutoff wall proposed for this portion of the NEMDC west levee, which is 40 feet below ground surface (-10 feet NAVD88).

Kleinfelder estimated the water level changes due to the cutoff walls along the Sacramento River east levee (**Appendix B**, "Evaluation of Cutoff Walls Impact on Groundwater Recharge Sacramento River East Levee Natomas Levee Improvement Project Sacramento and Sutter Counties, California"). These results were summarized in Impact 4.4-c, "Effects on Groundwater," in the Phase 3 DEIS/DEIR. On the river side of the levee, the predicted effects of the cutoff walls are negligible at low stage, and there would be a slight increase in head (less than one foot) at high stage. These small effects are considered to be less than significant even for the shallowest domestic wells (less than 100 feet deep). No measurable decreases in well yields or increases in pumping costs are expected due to cutoff walls along the Sacramento River east levee.

Similar modeling has not been conducted for wells along the PGCC or NEMDC, but cutoff walls would be expected to have similarly small effects near the eastern edge of the Natomas Basin. Because the general direction of groundwater flow in this area is from west to east, static groundwater levels would increase slightly west of the levee and decrease slightly east of the levee. This effect would not reduce the ability of most wells to draw groundwater because the production zone for these wells is below the bottom of the proposed cutoff walls. Very shallow wells located near the cutoff wall on either side of the levee could experience slightly lower pumping water levels because the cutoff wall would act as a low permeability boundary that would reduce the aerial extent and increase the depth of the localized cone of depression. This effect would not be measurable for most wells, but wells less than 80 feet deep located within 500 feet of the NEMDC west levee could experience a small decrease in yield. This impact is considered less-than-significant; however, Mitigation Measure 4.4-c has been added in Chapter 4.0 of this FEIR, "Revisions to the DEIS/DEIR," to ensure that the owners of any affected well are adequately compensated for replacing their shallow well with a deeper one, if necessary.

Regarding the concern that the materials used in cutoff wall construction could affect the water quality of domestic wells, the bentonite, and potentially cement, materials used in the installation of cutoff walls are

designed to be stable and resistant to erosion and extrusion into the sand and gravel layers adjacent to the cutoff wall. Therefore, no groundwater quality issues would be associated with construction of the cutoff walls.

2.2.2 MASTER RESPONSE: SACRAMENTO RIVER EAST LEVEE PRISM

Several comment letters stated that the Phase 3 DEIS/DEIR did not provide enough information to fully explain the levee prism concept, the adjacent setback levee footprint, and potential construction-related impacts to vegetation and improvements. SAFCA has prepared the following response regarding the levee prism.

Plate 4 shows a typical profile view of the existing levee along the east side of the Sacramento River in comparison to the adjacent setback levee proposed for the Phase 3 Project (Reaches 5A–9B). The prism for the existing levee consists of:

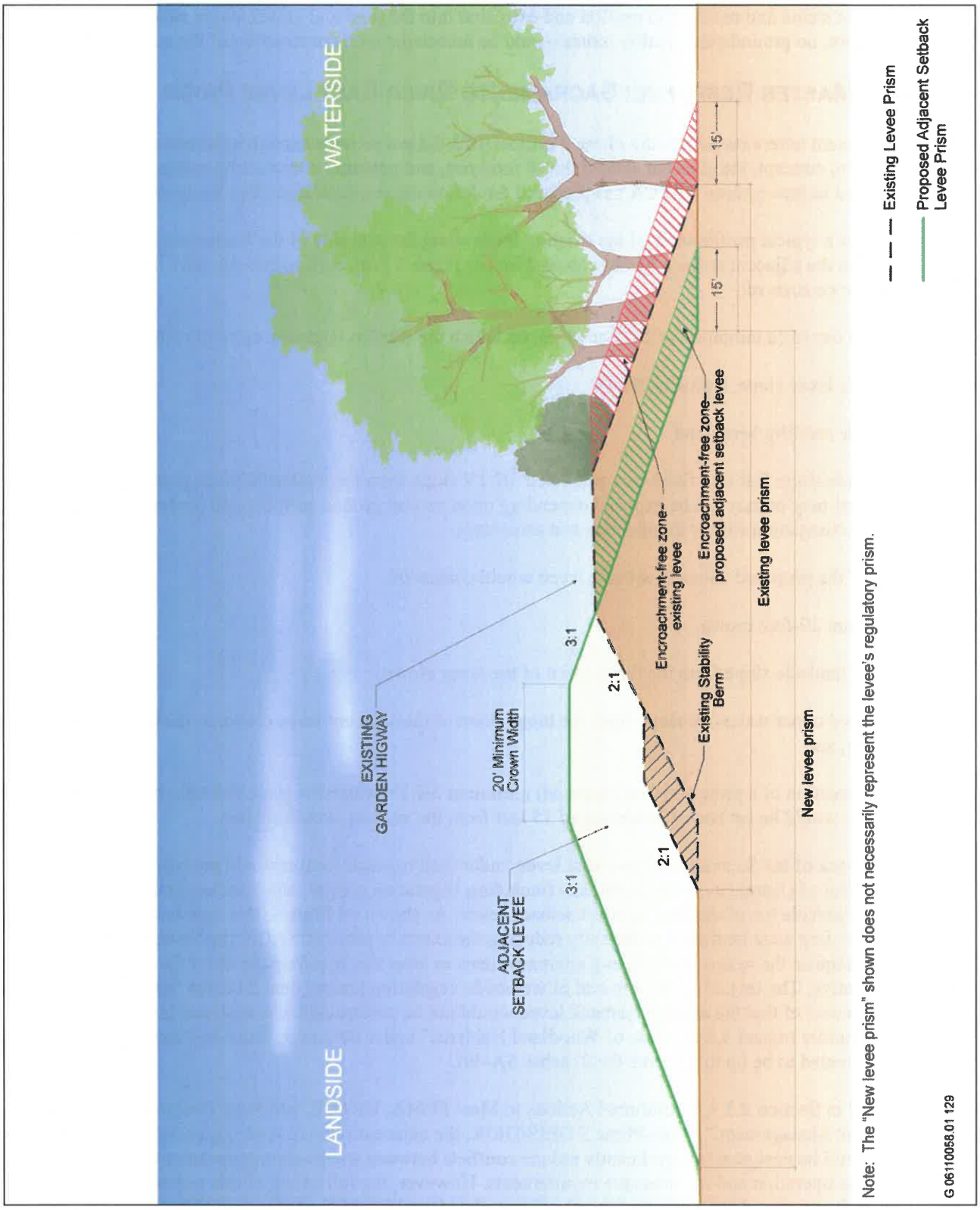
- the levee crown (a minimum of 20 feet wide), on which the Garden Highway currently sits;
- a landside levee slope, typically 2H:1V
- a landside stability berm; and
- a waterside slope that is defined by a projected 3H:1V slope from the waterside hinge point of the levee crown that may or may not be exposed depending upon natural ground surfaces and property improvements, such as construction fill for foundations and driveways.

The prism of the proposed adjacent setback levee would consist of:

- a minimum 20-foot crown,
- a 3H:1V landside slope from the hinge point of the levee crown,
- an exposed upper waterside slope from the hinge point of the adjacent levee crown to the landside of Garden Highway, and
- the continuation of a projected (non-exposed) minimum 3H:1V waterside slope through the existing levee to a point that would be set back a minimum of 15 feet from the existing waterside toe.

The setting back of the Sacramento River east levee under the Proposed Action would provide the USACE-required 15 feet of clearance of encroachments (including vegetation greater than 2 inches in diameter) from the theoretical waterside toe of the new adjacent setback levee. As shown on **Plate 4**, this approach would shift the encroachment-free zone landward, potentially reducing the extent to which USACE, the State, SAFCA, and RD 1000 would require the removal of existing encroachments to meet this requirement under the Levee Raise-in-Place Alternative. The impact of the removal of waterside vegetation greater than 2 inches that would potentially occur in the event of that the adjacent setback levee would not be constructed was analyzed in the Phase 3 DEIS/DEIR under Impact 4.8-a, "Loss of Woodland Habitats," under the Levee Raise-in-Place Alternative. This loss was estimated to be up to 22 acres for Reaches 5A–9B.

As described in Section 2.3.5, "Additional Actions to Meet FEMA, USACE, and State Design Requirements: Encroachment Management," of the Phase 3 DEIS/DEIR, the adjacent setback levee proposed as part of the Phase 3 Project would be designed to significantly reduce conflicts between waterside encroachments and applicable USACE levee operation and maintenance requirements. However, the full extent of this reduction cannot be known until the proposed levee improvements are completed, and USACE, the State, SAFCA, and RD 1000 have inspected and evaluated whether there are any encroachments that affect the integrity of the levee. Section 1.4.2.1,



Source: Adapted by EDAW in 2009 based on data provided by HDR in 2009

Levee Prism Concept for the Sacramento River East Levee **Plate 4**

"Encroachment," in the Phase 3 DEIS/DEIR has been revised to reflect the fact that removal of any encroachments that could be identified as threatening levee integrity would be subject to future environmental review. See Chapter 4.0, "Revisions to the DEIS/DEIR," of this FEIR for the text revision.

2.2.5 MASTER RESPONSE: 24/7 CUTOFF WALL CONSTRUCTION

Numerous comment letters expressed concern about 24 hour-per-day, 7 days-per-week (24/7) construction activities associated with cutoff wall construction. Specifically, commenters requested a more detailed engineering explanation of why 24/7 cutoff wall construction work would be necessary, consideration of using multiple pieces of equipment at once to increase the productivity rate, resident relocation allowances, anticipated duration of potential relocation for residents within 500 feet of construction, and that SAFCA appears to be placing a higher priority on speed rather than environmental impacts. SAFCA has prepared the following response to these concerns.

Normal hours for construction would be from 6:00 a.m. to 8:00 p.m. as stated in the Phase 3 DEIS/DEIR. Installation of cutoff walls during night hours (from 8:00 p.m. to 6:00 a.m.) would be necessary to maintain the construction schedule and install a quality cutoff wall. The 24/7 construction is required due to regional and national demand for the long-stick excavators and deep soil mixing equipment that are needed for cutoff wall construction, the relatively short levee construction window (May 1 through November 1), the potential for wall imperfections that result from sand in the slurry trench settling to the bottom when work progress is interrupted, and the requirement that the cutoff wall be allowed to cure for at least 4 weeks before completing construction of the encapsulating adjacent levee.

It is anticipated that the 24/7 cutoff wall construction would occur Monday through Saturday, with Sunday reserved for equipment maintenance. However, if unanticipated events occur, cutoff wall construction could also be conducted on Sundays. Lights and power generators would be used during nighttime construction hours. Additional equipment would include cutoff wall rigs, excavators, generators, pumps, support vehicles, and other ancillary equipment. The cutoff wall would be installed in several headings. The number and locations of the headings would be dependent on the project schedule and contractor preference. Each cutoff wall rig would move continuously along the proposed alignment to ensure an uninterrupted cutoff wall and to reduce prolonged disturbance to adjacent residences. Each cutoff wall rig can move between 50 and 100 feet horizontally during a twelve-hour work shift.

As stated in the Phase 3 DEIS/DEIR, residents in or near the affected work area would be afforded the opportunity, at SAFCA's expense, to temporarily relocate to a nearby hotel for as long as the 24/7 schedule persists within 500 feet of their residence (see Mitigation Measure 4.14-a, "Implement Noise-Reducing Construction Practices, Prepare a Noise Control Plan, and Monitor and Record Construction Noise Near Sensitive Receptors"). The 500-foot distance was determined to be the distance at which models indicate that noise levels from cutoff wall construction equipment (deep soil mixing equipment or long-stick excavators) would be at or below 60 dBA L_{dn}, which is the standard for exterior night time noise levels established by Sacramento County and the City of Sacramento, as stated in Section 4.14, "Noise," of the Phase 3 DEIS/DEIR. Based on this distance of 500 feet from construction equipment, in the worst case, residents in the vicinity of cutoff wall construction could be affected by round-the-clock construction for approximately one week as the cutoff wall is installed along the levee.

The 500-foot distance is modeled based on the assumption that sensitive receptors are located in the line-of-sight from the noise source. Additional reductions in noise levels would come from natural sound barriers, such as existing levees or other structures, including dwellings. For example, cutoff walls along the Sacramento River east levee would be constructed on the land side of the levee at an elevation below the crown of the levee. Therefore, the existing levee would provide some shielding to residents on the water side of the Garden Highway, reducing exterior noise levels at 500 feet by an additional 10–12 dB below the predicted level of 60 dBA L_{dn}. This

estimate is based on the assumption that cutoff wall construction equipment would generate noise at the level of 10 feet above ground surface, and the height of the existing levee is 25 feet above ground surface. Waterside residences would be out of the line-of-sight of this equipment.

Residences located adjacent to the NEMDC west levee, where cutoff wall construction would also be conducted as part of the Phase 3 Project, would not be shielded by the existing levee because construction would take place on top of the degraded levee. However, for residents not located immediately adjacent to the levee, intervening building façades and ground absorption would significantly reduce noise levels, and residents located at or beyond 500 feet from construction would likely experience noise levels below the exterior noise standard of 60 dBA L_{dn} due to these obstructions and the increasing distance from the noise source.

3 RESPONSES TO COMMENTS ON THE DEIS/DEIR

This chapter contains the comment letters (including transcribed comments received during the March 19, 2009 public hearing) received on the Phase 3 DEIS/DEIR and USACE's and SAFCA's individual responses to significant environmental issues raised in those comments. Each letter, as well as each individual comment within the letter, has been given a number for cross-referencing. Responses are sequenced to reflect the order of comments within each letter.

Table 3-1 lists all parties who submitted comments on the Phase 3 DEIS/DEIR during the public review period.

Table 3-1
List of Commenters

Letter #	Commenter	Date of Comment	Page Number
Federal Agencies (F)			
F1	U.S. Department of the Interior, Office of the Secretary, Office of Environmental Policy and Compliance, Pacific Southwest Region	April 6, 2009	F1-1
F2	U.S. Environmental Protection Agency, Region IX	April 3, 2009	F2-1
State Agencies (S)			
S1	State of California – The Resources Agency, Central Valley Flood Protection Board	February 23, 2009	S1-1
S2	State of California – The Resources Agency, Central Valley Flood Protection Board	April 3, 2009	S2-2
S3	California State Lands Commission	April 2, 2009	S3-2
S4	California Office of Planning and Research	April 7, 2009	S4-2
S5	California Department of Fish and Game	April 9, 2009	S5-2
Local Agencies (L)			
L1	Sacramento Metropolitan Air Quality Management District	March 18, 2009	L1-1
L2	Sutter County, Neal P. Hay PE, Associate Civil Engineer	April 3, 2009	L2-1
L3	Reclamation District 2035 and Conaway Preservation Group	April 6, 2009	L3-1
L4	Twin Rivers Unified School District	April 6, 2009	L4-1
L5	Sacramento County Department of Transportation	April 6, 2009	L5-1
Organizations (O)			
O1	Reach Seven Property Owners	April 2, 2009	O1-1
O2	Garden Highway Community Association	April 3, 2009	O2-1
O3	Sacramento Area Bicycle Advocates	April 5, 2009	O3-1
O4	Valley View Acres Community Association	April 6, 2009	O4-1
O5	Association for the Environmental Preservation of the Garden Highway	April 2, 2009	O5-1

Table 3-1 List of Commenters			
Letter #	**Commenter**	**Date of Comment**	**Page Number**
Individuals (I)			
I1	Dan Pellissier	February 26, 2009	I1-1
I2	David Lichman	February 26, 2009	I2-1
I3	David Lichman	March 2, 2009	I3-1
I4	Christopher Barabino, Owner Swabbies Restaurant	March 4, 2009	I4-1
I5	Diane Hovey	March 10, 2009	I5-1
I6	Linda Luhman	March 12, 2009	I6-1
I7	Ed Bianci	March 16, 2009	I7-1
I8	Anthony Trujillo	April 6, 2009	I8-1
I9	Chris and Caroll Mortensen	April 6, 2009	I9-1
I10	Gibson Howell	April 6, 2009	I10-1
I11	Laura and Harvey Gilbeau and Don and Anita Glidewell	April 6, 2009	I11-1
I12	Christopher Barabino, Owner Swabbies Restaurant	April 6, 2009	I12-1
I13	Joe and Angela Angel	March 27, 2009	I13-1
Public Hearing (PH)			
PH	March 19, 2009 Public Hearing	March 19, 2009	PH-1

F1

United States Department of the Interior

OFFICE OF THE SECRETARY
Office of Environmental Policy and Compliance
Pacific Southwest Region
1111 Jackson Street, Suite 520
Oakland, California 94607

IN REPLY REFER TO:
ER# 09/210

E-filed

6 April 2009

Elizabeth Holland
Planning Division
Sacramento District
U.S. Army Corps of Engineers
1325 J Street
Sacramento, CA 95814-2992

Subject: Review of the Draft Environmental Impact Statement (DEIS) for the Natomas Levee Improvement Program, Phase 3 Landslides Improvement Project, CA

Dear Ms. Holland:

The Department of the Interior has received and reviewed the subject document and has no comments to offer. F1-1

Thank you for the opportunity to review this project.

Sincerely,

Letter F1 Response	U.S. Department of the Interior, Office of the Secretary, Office of Environmental Policy and Compliance, Pacific Southwest Region April 6, 2009

F1-1 Comment noted; the U.S. Department of the Interior has reviewed the Phase 3 DEIS/DEIR and has no comments.

F2

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION IX
75 Hawthorne Street
San Francisco, CA 94105-3901

April 3, 2009

Ms. Elizabeth Holland
Planning Division
Sacramento District
U.S. Army Corps of Engineers
1325 J Street
Sacramento, California 95814-2922

Subject: Draft Environmental Impact Statement (DEIS) for the Natomas Levee Improvement Program, Phase 3 Landside Improvements Project (CEQ# 20090040)

The U.S. Environmental Protection Agency (EPA) has reviewed the above-referenced document pursuant to the National Environmental Policy Act (NEPA), Council on Environmental Quality (CEQ) regulations (40 CFR Parts 1500-1508), and our NEPA review authority under Section 309 of the Clean Air Act.

EPA previously reviewed the DEIS and Final EIS (FEIS) for 408 Permission and 404 Permit to Sacramento Area Flood Control Agency (SAFCA) for the Phase 2 Landside Improvements Project and programmatic evaluation of the entire Natomas Levee Improvement Program (NLIP). We provided comments to the U.S. Army Corps of Engineers (Corps) on August 4, 2008 and December 11, 2008, expressing concerns because of our inability to determine whether or not the preferred alternative represents the Least Environmentally Damaging Practicable Alternative (LEDPA). We also expressed concern with the residual flood risk to development in a floodplain protected by levees, and the indirect and cumulative environmental effects of planned development facilitated by this levee project. F2-1

We continue to have concerns regarding the residual flood risk and the potential indirect and cumulative impacts of future development. We recommend implementation of the Natomas Basin flood safety plan (pps. 2-40 to 2-41) as soon as possible and prior to approval of additional development, so that new development does not compromise the flood-damage-and-risk-reduction achievements of this project. F2-2

While we commend efforts to avoid and fully compensate for the loss of riparian woodland, Giant garter snake habitat, wetlands, and Swainson's hawk habitat; we continue to have concerns with 371.48 acres of temporary effects and 36.75 acres of permanent effects on waters of the United States (US) for all four phases of the Natomas Levee Improvement Program (2008 – 2010) (p. ES-12, Phase 2 FEIS, November 2008). We recommend continued close consultation and collaboration with the U.S. Fish and F2-3

SAFCA '09 APR 9 PM2:04

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Wildlife Service, California Department of Fish and Game, The Natomas Basin Conservancy, SAFCA, and Sacramento Area Council of Governments to ensure effects on woodlands, threatened and sensitive species habitat, and waters of the US are avoided and minimized.

F2-3 Cont'd

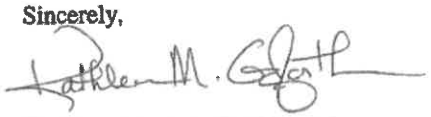
Phases 1 to 4 of the Natomas Landside Improvement Project constitute an "early implementation project" to improve Natomas Basin perimeter levees to meet the 100-year flood protection design criteria adopted by the Federal Emergency Management Agency. The remaining segments of the perimeter levee system would be improved by the Corps to provide flood protection that would meet California standards for the "200-year" flood stage surface water elevation. The Corps plans to seek Congressional authorization for this additional work based on a General Re-evaluation Report for the American River Common Features Project to be presented to Congress in 2010 (p. ES-3). As a reasonably foreseeable future action, the Corps' proposed "200-year" levee improvement project should be included in the evaluation of cumulative effects in the FEIS for the NLIP Phase 3 Landside Improvements Project.

F2-4

Based on the above concerns, we have rated this DEIS as Environmental Concerns – Insufficient Information (EC-2) (see enclosed "*Summary of Rating Definitions*"). We appreciate the opportunity to review this DEIS. When the FEIS is released for public review, please send one hard copy and a CD ROM to the address above (mail code: CED-2). If you have any questions, please contact me at (415) 972-3521, or contact Laura Fujii, the lead reviewer for this project. Laura can be reached at (415) 972-3852 or fujii.laura@epa.gov.

F2-5

Sincerely,



Kathleen M. Goforth, Manager
Environmental Review Office
Communities and Ecosystems Division

Enclosures: Summary of Rating Definitions

cc: Ken Sanchez, U.S. Fish and Wildlife Service
Robert Solecki, Central Valley RWQCB
Jeff Drongesen, California Department of Fish and Game
John Bassett, Sacramento Area Flood Control Agency

U.S. Environmental Protection Agency Rating System for Draft Environmental Impact Statements Definitions and Follow-Up Action*

Environmental Impact of the Action

LO – Lack of Objections

The U.S. Environmental Protection Agency (EPA) review has not identified any potential environmental impacts requiring substantive changes to the proposal. The review may have disclosed opportunities for application of mitigation measures that could be accomplished with no more than minor changes to the proposal.

EC – Environmental Concerns

EPA review has identified environmental impacts that should be avoided in order to fully protect the environment. Corrective measures may require changes to the preferred alternative or application of mitigation measures that can reduce these impacts.

EO – Environmental Objections

EPA review has identified significant environmental impacts that should be avoided in order to provide adequate protection for the environment. Corrective measures may require substantial changes to the preferred alternative or consideration of some other project alternative (including the no-action alternative or a new alternative). EPA intends to work with the lead agency to reduce these impacts.

EU – Environmentally Unsatisfactory

EPA review has identified adverse environmental impacts that are of sufficient magnitude that they are unsatisfactory from the standpoint of public health or welfare or environmental quality. EPA intends to work with the lead agency to reduce these impacts. If the potential unsatisfactory impacts are not corrected at the final EIS stage, this proposal will be recommended for referral to the Council on Environmental Quality (CEQ).

Adequacy of the Impact Statement

Category 1 – Adequate

EPA believes the draft EIS adequately sets forth the environmental impact(s) of the preferred alternative and those of the alternatives reasonably available to the project or action. No further analysis of data collection is necessary, but the reviewer may suggest the addition of clarifying language or information.

Category 2 – Insufficient Information

The draft EIS does not contain sufficient information for EPA to fully assess environmental impacts that should be avoided in order to fully protect the environment, or the EPA reviewer has identified new reasonably available alternatives that are within the spectrum of alternatives analyzed in the draft EIS, which could reduce the environmental impacts of the action. The identified additional information, data, analyses or discussion should be included in the final EIS.

Category 3 – Inadequate

EPA does not believe that the draft EIS adequately assesses potentially significant environmental impacts of the action, or the EPA reviewer has identified new, reasonably available alternatives that are outside of the spectrum of alternatives analyzed in the draft EIS, which should be analyzed in order to reduce the potentially significant environmental impacts. EPA believes that the identified additional information, data, analyses, or discussions are of such a magnitude that they should have full public review at a draft stage. EPA does not believe that the draft EIS is adequate for the purposes of the National Environmental Policy Act and or Section 309 review, and thus should be formally revised and made available for public comment in a supplemental or revised draft EIS. On the basis of the potential significant impacts involved, this proposal could be a candidate for referral to the CEQ.

* From EPA Manual 1640 Policy and Procedures for the Review of Federal Actions Impacting the Environment. February, 1987.

F2-1 USACE and SAFCA received U.S. Environmental Protection Agency's (EPA's) referenced comment letters (dated August 4 and December 11, 2008) on the Phase 2 EIS. Responses were provided in the Phase 2 FEIS (USACE 2008) and Record of Decision (ROD) (USACE 2009), respectively, which are in the record and were considered by USACE and SAFCA in their decision-making on the Phase 2 Project; the content of the letters was also considered during preparation of this FEIR.

F2-2 Sacramento and Sutter County and the City of Sacramento have developed and are administering flood safety plans affecting the Natomas Basin within their respective jurisdictions. These plans will be updated as additional development in the Natomas Basin is approved.

Section 2.5.1, "Residual Risk of Flooding," in the Phase 3 DEIS/DEIR describes SAFCA's ongoing efforts to manage the residual risk of flooding in the Natomas Basin, which would remain even with achievement of a "200-year" level of flood risk reduction. As noted in Section 2.5.1, these efforts include providing the state with a safety plan (including a flood preparedness plan, levee patrol plan, flood-fight plan, and evacuation plan). Additionally, SAFCA has implemented a development impact fee program with the objective of avoiding any substantial increase in the expected damage due to an uncontrolled flood as new development proceeds in the floodplain. The revenue generated by the fee program will be used to implement flood risk reduction measures on an ongoing basis and to further reduce flood risk as new development occurs in the floodplain (see also Response to Comment L3-9).

F2-3 The Natomas Levee Improvement Program (NLIP) includes habitat conservation components as part of each project phase, as well as mitigation measures to avoid and minimize impacts to sensitive habitats and species. For example, Mitigation Measure 4.6-b, "Restore, Replace, or Rehabilitate Degraded SRA Habitat Function and Comply with Section 7 of the Federal Endangered Species Act, Section 1602 of the California Fish and Game Code, and Section 2081 of the California Endangered Species Act Permit Conditions," requires restoration, replacement or rehabilitation of degraded SRA habitat function and compliance with Section 7 of the Federal Endangered Species Act, Section 1602 of the California Fish and Game Code, and Section 2081 of the California Endangered Species Act Permit conditions; and Mitigation Measure 4.7-a, "Minimize Effects on Jurisdictional Waters of the United States, Complete Detailed Design of Habitat Creation Components and Secure Management Agreements to Ensure Compensation of Waters Filled, and Comply with Section 404, Section 401, Section 10, and Section 1602, Permit Processes," requires minimization of effects on jurisdictional Waters of the United States, completion of detailed design of habitat creation components and securing management agreements to ensure compensation of waters filled, and compliance with Section 404, Section 401, Section 10, and Section 1602, permit processes. SAFCA will continue to consult and collaborate closely with Federal, state, regional, and local agencies (including USACE, the U.S. Fish and Wildlife Service [USFWS], the California Department of Fish and Game [DFG], and The Natomas Basin Conservancy [TNBC]) on developing and implementing these measures. SAFCA is working closely with USACE on impacts to Waters of the United States for the NLIP through several NEPA documents covering Clean Water Act Section 404 approval, as well as several permit applications to fill Waters of the United States. SAFCA is also working closely with USFWS, the National Marine Fisheries Service (NMFS), DFG, and TNBC to ensure biological effects are avoided and/or minimized to the extent practicable.

Chapter 7.0, "Consultation and Coordination," of the Phase 3 DEIS/DEIR describes the consultation activities between USACE, SAFCA, USFWS, and DFG that have taken place in connection with the NLIP. Additionally, SAFCA has collaborated with TNBC on the planning, design, and long-term management of the NLIP's proposed habitat conservation components. This has involved multiple meetings and negotiations with the resource agencies and other Natomas Basin land managers such as Reclamation District (RD) 1000, and is ongoing. SAFCA has also coordinated with the Sacramento Area Council of Governments (SACOG), which endorsed SAFCA's White Paper in April 2006 (available on SAFCA's Web site at www.safca.org), to discuss the regional implications of providing improved flood damage reduction to the Natomas Basin. USACE and SAFCA will continue to work collaboratively with USFWS, DFG, TNBC, and SACOG.

F2-4 The Phase 1 Project, which was analyzed in the Local Funding EIR (SAFCA 2007a), has been constructed. The Phase 2, 3, and 4 Projects were fully analyzed in the Phase 2 EIR (SAFCA 2007b) and Phase 2 EIS (USACE 2008), and constitute the remainder of the NLIP Landside Improvements Project. This project-levee EIR is tiered from the above-mentioned documents and involves a portion of that bigger project. As described in Chapter 2.0, "Alternatives," in the Phase 3 DEIS/DEIR, where repairs are required in the Natomas Basin perimeter levee to address 100-year levee height deficiencies, SAFCA would repair the levee to meet the desired minimum of 3 feet of levee height above the "200-year" design water surface profile, thereby laying the groundwork for completion of "200-year" flood risk reduction over time. As part of the Phase 3 Project, the Sacramento River east levee improvements would be constructed with a levee crown at least 3 feet above the "200-year" design water surface profile. The existing height of the NEMDC west levee between Elkhorn Boulevard and Northgate Boulevard is anticipated to meet the "200-year" height requirement. Under SAFCA's approach, this would leave only a minor amount of work for USACE to complete the "200-year' improvements, primarily along the American River north levee and the NEMDC west levee between Elkhorn Boulevard and Sankey Road. These remaining repairs would make a minor contribution to the significant cumulative impacts that have been identified for the NLIP, as discussed in Chapter 5.0, "Cumulative and Growth-Inducing Impacts, and Other Statutory Requirements," in the Phase 3 DEIS/DEIR.

F2-5 Comment noted; a copy of the FEIR, and subsequently the FEIS to be prepared by USACE, will be provided to EPA as requested.

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S1

STATE OF CALIFORNIA – THE RESOURCES AGENCY ARNOLD SCHWARZENEGGER, GOVERNOR

CENTRAL VALLEY FLOOD PROTECTION BOARD
3310 El Camino Ave., Rm. LL40
SACRAMENTO, CA 95821
(916) 574-0609 FAX: (916) 574-0682
PERMITS: (916) 574-0685 FAX: (916) 574-0682

February 23, 2009

John Bassett
Sacramento Area Flood Control Agency
1007 7th Street, 7th Floor
Sacramento, CA 95814

Dear Mr. Bassett:

State Clearinghouse (SCH) Number: 2008072060
Natomas Levee Improvement Program, Phase 3 Landslide Improvements Project

Staff for the Department of Water Resources has reviewed the subject document and provides the following comments:

The proposed project is located within the jurisdiction of the Central Valley Flood Protection Board (Formerly known as The Reclamation Board). The Board is required to enforce standards for the construction, maintenance and protection of adopted flood control plans that will protect public lands from floods. The jurisdiction of the Board includes the Central Valley, including all tributaries and distributaries of the Sacramento River and the San Joaquin River, and designated floodways (California Code of Regulations (CCR) Title 23, Section 2).

A Board permit is required prior to starting the work within the Board's jurisdiction for the following:

- The placement, construction, reconstruction, removal, or abandonment of any landscaping, culvert, bridge, conduit, fence, projection, fill, embankment, building, structure, obstruction, encroachment, excavation, the planting, or removal of vegetation, and any repair or maintenance that involves cutting into the levee; S1-1
- Existing structures that predate permitting or where it is necessary to establish the conditions normally imposed by permitting. The circumstances include those where responsibility for the encroachment has not been clearly established or ownership and use have been revised (CCR, Title 23, Section 6).

The permit application and CCR Title 23 regulations can be found on the Central Valley Flood Protection Board's website at http://www.cvfpb.ca.gov/.

If you have any questions please contact me at (916) 574-0651 or jherota@water.ca.gov.

Sincerely,

James Herota
Staff Environmental Scientist
Floodway Protection Section
Division of Flood Management

cc:

Governor's Office of Planning and Research
State Clearinghouse
1400 Tenth Street, Room 121
Sacramento, CA 95814

Letter S1 Response	State of California – The Resources Agency, Central Valley Flood Protection Board James Herota, Staff Environmental Scientist February 23, 2009

S1-1 SAFCA recognizes that the Phase 3 Project would involve alterations of levees under the jurisdiction of the Central Valley Flood Protection Board (CVFPB) and would therefore require an encroachment permit from the CVFPB to construct those alterations. (See also Section 1.7.3.2, "State Actions/Permits," in the Phase 3 DEIS/EIR.) SAFCA would obtain all necessary permits and approvals before project construction.

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S2

STATE OF CALIFORNIA – THE RESOURCES AGENCY ARNOLD SCHWARZENEGGER, GOVERNOR
CENTRAL VALLEY FLOOD PROTECTION BOARD
3310 El Camino Ave., Rm. LL40
SACRAMENTO, CA 95821
(916) 574-0609 FAX: (916) 574-0682
PERMITS: (916) 574-0685 FAX: (916) 574-0682

April 3, 2009

John Bassett
Sacramento Area Flood Control Agency
1007 7th Street, 7th Floor
Sacramento, CA 95814

Dear Mr. Bassett:

State Clearinghouse (SCH) Number: 2008072060
Draft Environmental Impact Statement/Draft Environmental Impact Report (DEIS/DEIR) on the Natomas Levee Improvement Program, Phase 3 Landside Improvements Project

The Central Valley Flood Protection Board (Board) is responsible for flood safety within California and maintains the integrity of the existing flood control system and designated floodways through the Board's regulatory authority by issuing permits for encroachments. Development projects within the jurisdiction of the Board are required to meet standards for the construction, maintenance, and protection of adopted plans of flood control that will protect public lands from floods. The jurisdiction of the Board includes the Central Valley, including all tributaries and distributaries of the Sacramento River and the San Joaquin River, and designated floodways (Title 23 California Code of Regulations, Section 2). Working with the Sacramento Area Flood Control Agency staff early in the project planning will help Board staff and other interested parties to identify potential project impacts, appropriate mitigation measures, and thereby improves the safety of floodways. S2-1

Board staff has reviewed the DEIS/DEIR on the Natomas Levee Improvement Program, Phase 3 Landside Improvements Project and provides the following comments:

- According to the DEIR, p. 2-8 states "Additional construction details for the Proposed Action and Levee Raise-in-Place Alternative are presented in Appendix H, "Construction Details." The Proposed Action and additional action alternative (the Levee Raise-In-Place Alternative) were developed for consideration for the Phase 3 Project with a focus on improvements to the Sacramento River east levee (Reaches 5A-9B). Phase 3 Project improvements to the PGCC west levee, the NEMDC west levee, and landscape and irrigation/drainage system modifications would be similar under the Proposed Action and the Levee Raise-in-Place Alternative." S2-2

  There is limited information as to the irrigation of the vegetation that will be introduced to the levee and drainage canal systems. CVFPB staff reviewed Appendix H, "Construction Details" that includes erosion control measures using a hydroseeding truck to seed disturbed areas, p. H-24. The method of irrigation was not listed, therefore comments are not able to be provided on the irrigation system.

The irrigation of vegetation on levee slopes is required to be in accordance with Title 23, Section 131 (j).

S2-2 Cont.

- CVFPB staff reviewed the New Giant Garter Snake/Drainage Canal, Appendix H p. H-29, which states "Construction activities for the GGS/Drainage Canal and Elkhorn Canal would be similar, and these components would be constructed concurrently. This approach would facilitate the use of excavated material from the GGS/Drainage Canal north of 1-5 for use as embankment material along the Elkhorn Canal. Habitat enhancement would include planting tules on the sloped banks. Backhoes would be used to prepare the planting areas and a water truck would be used to control dust."

  There is limited information as to the analysis conducted to determine how the use of tules for giant garter snake habitat was determined and how the tules would be maintained without adverse impacts to the giant garter snake and flood control. Vegetation requirements in accordance with Title 23, Section 131 (c) states "Vegetation must not interfere with the integrity of the adopted plan of flood control, or interfere with maintenance, inspection, and flood fight procedures." Alternative sites outside of the designated floodway would be a feasible site giant garter snake habitat, without having an adverse impact to flood control.

S2-3

Title 23 CCR can be found on the Central Valley Flood Protection Board's website at http://www.cvfpb.ca.gov/. Thank you for your consideration of these comments, please contact me if you have any questions.

Sincerely,

James Herota

James Herota
Staff Environmental Scientist
Floodway Protection Section
Division of Flood Management

cc: Governor's Office of Planning and Research
State Clearinghouse
1400 Tenth Street, Room 121
Sacramento, California 95814

Letter S2 Response	State of California – The Resources Agency, Central Valley Flood Protection Board James Herota, Staff Environmental Scientist April 3, 2009

S2-1 See Response to Comment S1-1.

S2-2 There is no plan to irrigate (other than natural rainfall) the perennial grassland sod on the Sacramento River east levee, PGCC, and NCC levees, berms, or levee O&M rights-of-way once the establishment period has been completed. Drainage canal banks would also be dry-seeded and not irrigated with one minor exception: a 1- to 2-foot-wide band at the managed summer waterline would be plug-planted with two rows of native sedges and rushes, which would be sustained by canal water that saturates the toe of the bank.

S2-3 The habitat value of the new GGS/Drainage Canal is addressed in Impact 4.9-c, "Impacts on Giant Garter Snake Related to Construction Activities," in the Phase 3 DEIS/DEIR, which notes that tule vegetation provides suitable cover and foraging habitat for giant garter snake. The canal would be designed to reduce the frequency and extent of maintenance disturbance to canal bed and banks, which would reduce disturbance to this giant garter snake habitat. The sides would be sloped at an angle shallow enough to facilitate the shoreline growth of freshwater marsh plants, including native sedges, rushes, and tules that would provide habitat enhancement for giant garter snakes. Perennial grasses would be planted on banks above the row of shoreline marsh plants to provide better cover for giant garter snakes, discourage weeds, raise cutting height above the ground, and reduce the frequency of disturbance to bank vegetation. The GGS/Drainage Canal would be located between 1,000 and 5,000 feet to the landside of the new levee toe (see Plate 17a in the Phase 3 DEIS/DEIR) and would not interfere with maintenance, inspection, or flood fight procedures. This canal would not be located within the designated floodway and therefore would not have an adverse impact related to flood risk reduction.

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S3

STATE OF CALIFORNIA ARNOLD SCHWARZENEGGER, *Governor*

CALIFORNIA STATE LANDS COMMISSION
100 Howe Avenue, Suite 100-South
Sacramento, CA 95825-8202

PAUL D. THAYER, *Executive Officer*
(916) 574-1800 FAX (916) 574-1810
Relay Service From TDD Phone **1-800-735-2929**
from Voice Phone **1-800-735-2922**

Contact Phone: **(916) 574-1900**
Contact FAX: **(916) 574-1885**

April 2, 2009

File Ref: SCH# 2008072060

John Bassett
Sacramento Area Flood Control Agency (SAFCA)
1007 7th Street, 7th Floor
Sacramento, CA 95814

Subject: Natomas Levee Improvement Program, Phase 3 Landside Improvements Project, Draft Environmental Impact Statement/ Environmental Impact Report (DEIS/DEIR)

Dear Mr. Bassett:

The purpose of this letter is to provide you with comments on the Draft Environmental Impact Statement/ Environmental Impact Report for the Natomas Levee Improvement Program (NLIP), Phase 3 Landside Improvements Project. Under the California Environmental Quality Act (CEQA), the California State Lands Commission (CSLC) may be a Responsible and/or Trustee Agency for this project and has commented on the previous CEQA/NEPA documents prepared for NLIP.

The State acquired sovereign ownership of all tidelands and submerged lands and beds of navigable waterways upon its admission to the United States in 1850. The State holds these lands for the benefit of all the people of the State for statewide Public Trust purposes which include waterborne commerce, navigation, fisheries, water-related recreation, habitat preservation, and open space. The landward boundaries of the State's sovereign interests in areas that are subject to tidal action are generally based upon the ordinary high water marks of these waterways as they last naturally existed. In non-tidal navigable waterways, the State holds a fee ownership in the bed of the waterway between the two ordinary low water marks as they last naturally existed. The entire non-tidal navigable waterway between the ordinary high water marks is subject to the Public Trust easement. Both the easement and fee-owned lands are under the jurisdiction of the CSLC. The locations of the ordinary high and low water marks are often related to the last natural conditions of the river, and may not be apparent from a present day site inspection. S3-1

To the extent the proposed project lies waterward of the ordinary high water mark in the Sacramento River, a lease will be required. In addition, to the extent the proposed project involves State-owned sovereign lands in the American River under the jurisdiction of the CSLC, a lease will be required. A portion of the proposed project in the American River may involve sovereign lands granted in trust to the city of S3-2

SAFCA '09 APR 9 PM2:04

Sacramento under Chapter 519, Statutes of 1868. Site specific drawings will need to be submitted to determine if the proposed project involves lands under the granted or ungranted jurisdiction of the CSLC. S3-2 Cont'd

In the event that a lease is required for the use of sovereign lands, the SAFCA's environmental document will be used by the CSLC for that discretionary action. Staff of the CSLC has concerns with regard to the analysis and mitigation for greenhouse gases (GHGs) in the DEIR/DEIS. The DEIR/DEIS states that 4,170 metric tons of carbon dioxide equivalents ($CO_{2(e)}$) of GHG emissions will be produced by construction of Phase 2 and Phase 3 of the project in 2009,with the same amount (4,170 metric tons of $CO_{2(e)}$) for construction activity in 2010 as well. However, the document does not state or identify what the estimated GHG emissions will be during the operation and maintenance of the project, once construction has been completed. Please provide an estimate of GHG emissions per year associated with operation and maintenance of the project. S3-3

Once all the GHG emissions are quantified, mitigation measures should be considered. The use of the newest and cleanest equipment is recognized as a best management practice and is a common mitigation measure used during construction and maintenance of the project. Additional mitigation measures may need to be considered, perhaps including purchasing carbon offsets in accordance with California Climate Action Registry or the California Air Resources Control Board.

Please contact Mary Hayes, Public Land Manager, at (916) 574-1843 or by email at haysm@slc.ca.gov for information about our leasing requirements. If you have any questions on the environmental review, please contact Christopher Huitt at (916) 574-1938 or by e-mail at huittc@slc.ca.gov.

Sincerely,

Gail Newton, Chief
Division of Environmental Planning
and Management

cc: Office of Planning and Research
State Clearinghouse
C. Huitt, CSLC
M. Hays, CSLC

Letter S3 Response	California State Lands Commission Gail Newton, Chief April 2, 2009

S3-1 Comment noted; the California State Lands Commission (CSLC) is recognized as a CEQA trustee and responsible agency.

S3-2 SAFCA recognizes that to the extent that NLIP construction on the waterside of the Sacramento River east levee would extend below the high watermark, as defined by CSLC, authorization would be required. Site-specific drawings will be submitted to CSLC to allow a determination as to whether the project will involve lands under CSLC's jurisdiction.

S3-3 As noted in Section 5.1.8.5, "Air Quality," in Chapter 5.0, "Cumulative and Growth-Inducing Impacts and Other Statutory Requirements," in the Phase 3 DEIS/DEIR, the Phase 3 Project would have no net increase in operational greenhouse gas (GHG) emissions. Emissions associated with the long-term operation of the Proposed Action are considered to be nominal and similar to existing conditions. No major sources of GHG emissions would be created and no substantial increase in vehicle miles traveled would occur as a result of project implementation. Therefore, quantification of operational GHG emissions is not necessary and there would be no cumulative contribution to GHG levels due to operation of the Phase 3 Project. Nonetheless, because of the intensity and duration of construction activities, and the lack of available mitigation measures to abate GHG emissions from heavy-duty construction equipment exhaust and on-road hauling emissions, the project's construction emissions would make an incremental temporary contribution to regional GHG emissions. Implementation of Mitigation Measure 4.13-a, "Implement Applicable District-Recommended Control Measures to Minimize Temporary Emissions of ROG, NO_X, and PM_{10} during Construction," in the Phase 3 DEIR/DEIS would reduce project-generated construction-related emissions, including GHG emissions. Because the project's emissions would be temporary and short-term in nature, and far below the minimum standard for reporting requirements under AB 32, the project's GHG emissions would not result in a cumulatively considerable contribution to a significant cumulative impact on GHG emissions.

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S4

STATE OF CALIFORNIA

GOVERNOR'S OFFICE *of* PLANNING AND RESEARCH

STATE CLEARINGHOUSE AND PLANNING UNIT

ARNOLD SCHWARZENEGGER
GOVERNOR

CYNTHIA BRYANT
DIRECTOR

April 7, 2009

John Bassett
Sacramento Area Flood Control Agency
1007 7th Street, 7th Floor
Sacramento, CA 95814

Subject: Natomas Levee Improvement Program, Phase 3 Landslide Improvements Project
SCH#: 2008072060

Dear John Bassett:

The State Clearinghouse submitted the above named Joint Document to selected state agencies for review. On the enclosed Document Details Report please note that the Clearinghouse has listed the state agencies that reviewed your document. The review period closed on April 6, 2009, and the comments from the responding agency (ies) is (are) enclosed. If this comment package is not in order, please notify the State Clearinghouse immediately. Please refer to the project's ten-digit State Clearinghouse number in future correspondence so that we may respond promptly.

Please note that Section 21104(c) of the California Public Resources Code states that:

> "A responsible or other public agency shall only make substantive comments regarding those activities involved in a project which are within an area of expertise of the agency or which are required to be carried out or approved by the agency. Those comments shall be supported by specific documentation."

S4-1

These comments are forwarded for use in preparing your final environmental document. Should you need more information or clarification of the enclosed comments, we recommend that you contact the commenting agency directly.

This letter acknowledges that you have complied with the State Clearinghouse review requirements for draft environmental documents, pursuant to the California Environmental Quality Act. Please contact the State Clearinghouse at (916) 445-0613 if you have any questions regarding the environmental review process.

Sincerely,

Terry Roberts

Terry Roberts
Director, State Clearinghouse

Enclosures
cc: Resources Agency

SAFCA '09 APR 9 PM2:04

1400 10th Street P.O. Box 3044 Sacramento, California 95812-3044
(916) 445-0613 FAX (916) 323-3018 www.opr.ca.gov

Document Details Report
State Clearinghouse Data Base

SCH# 2008072060
Project Title Natomas Levee Improvement Program, Phase 3 Landslide Improvements Project
Lead Agency Sacramento Area Flood Control Agency

Type JD Joint Document

Description The Phase 3 Landslide Improvements Project is part of SAFCA's efforts to reduce the risk of flooding to the Sacramento area. The Phase 3 Project includes flood risk reduction improvements (e.g., levee widening, setback levees, cutoff walls, seepage berms) along the Sacramento River east levee (from just north of Elkhorn Reservoir to just south of I-5), the Pleasant Grove Creek Canal west levee (between Howsley Rd. and Sankey Rd.), and the Natomas East Main Drainage Canal west levee (from Elkhorn Blvd. to Northgate Blvd.) as well as construction of a new canal to provide drainage and giant garter snake habitat (the "GGS/Drainage Canal"), removal of encroachments, and borrow and relandscaping activities in Sacramento and Sutter Counties.

Lead Agency Contact

Name John Bassett
Agency Sacramento Area Flood Control Agency
Phone 916-874-7606 **Fax**
email
Address 1007 7th Street, 7th Floor
City Sacramento **State** CA **Zip** 95814

Project Location

County Sacramento, Sutter
City Sacramento
Region
Lat / Long 38° 41' -" N / 121° 36' -" W
Cross Streets Various
Parcel No.
Township **Range** **Section** **Base**

Proximity to:

Highways 5, 99, 80
Airports Sacramento International
Railways
Waterways Sac & American R., Natomas Cross Can., Natomas East Main Drainage Can., Pleasant Grove Cr. Can.
Schools
Land Use Various, including flood control works, agriculture, and public right-of-way

Project Issues Agricultural Land; Air Quality; Archaeologic-Historic; Biological Resources; Flood Plain/Flooding; Geologic/Seismic; Noise; Public Services; Recreation/Parks; Soil Erosion/Compaction/Grading; Solid Waste; Toxic/Hazardous; Traffic/Circulation; Vegetation; Water Quality; Water Supply; Wetland/Riparian; Wildlife; Growth Inducing; Landuse; Cumulative Effects; Forest Land/Fire Hazard

Reviewing Agencies Resources Agency; Department of Boating and Waterways; Department of Conservation; Department of Fish and Game, Region 2; Cal Fire; Department of Parks and Recreation; Central Valley Flood Protection Board; Department of Water Resources; Office of Emergency Services; California Highway Patrol; Caltrans, District 3; Regional Water Quality Control Bd., Region 5 (Sacramento); Native American Heritage Commission; State Lands Commission

Date Received 02/13/2009 **Start of Review** 02/13/2009 **End of Review** 04/06/2009

Note: Blanks in data fields result from insufficient information provided by lead agency.

STATE OF CALIFORNIA – THE RESOURCES AGENCY ARNOLD SCHWARZENEGGER, GOVERNOR

CENTRAL VALLEY FLOOD PROTECTION BOARD
3310 El Camino Ave., Rm. LL40
SACRAMENTO, CA 95821
(916) 574-0609 FAX: (916) 574-0682
PERMITS: (916) 574-0685 FAX: (916) 574-0682

February 23, 2009

Clear
4.6.09
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RECEIVED
FEB 25 2009
STATE CLEARING HOUSE

John Bassett
Sacramento Area Flood Control Agency
1007 7th Street, 7th Floor
Sacramento, CA 95814

Dear Mr. Bassett:

State Clearinghouse (SCH) Number: 2008072060
Natomas Levee Improvement Program, Phase 3 Landslide Improvements Project

Staff for the Department of Water Resources has reviewed the subject document and provides the following comments:

The proposed project is located within the jurisdiction of the Central Valley Flood Protection Board (Formerly known as The Reclamation Board). The Board is required to enforce standards for the construction, maintenance and protection of adopted flood control plans that will protect public lands from floods. The jurisdiction of the Board includes the Central Valley, including all tributaries and distributaries of the Sacramento River and the San Joaquin River, and designated floodways (California Code of Regulations (CCR) Title 23, Section 2).

A Board permit is required prior to starting the work within the Board's jurisdiction for the following: S4-2

- The placement, construction, reconstruction, removal, or abandonment of any landscaping, culvert, bridge, conduit, fence, projection, fill, embankment, building, structure, obstruction, encroachment, excavation, the planting, or removal of vegetation, and any repair or maintenance that involves cutting into the levee;
- Existing structures that predate permitting or where it is necessary to establish the conditions normally imposed by permitting. The circumstances include those where responsibility for the encroachment has not been clearly established or ownership and use have been revised (CCR, Title 23, Section 6).

The permit application and CCR Title 23 regulations can be found on the Central Valley Flood Protection Board's website at http://www.cvfpb.ca.gov/.

If you have any questions please contact me at (916) 574-0651 or jherota@water.ca.gov.

Sincerely,

James Herota
Staff Environmental Scientist
Floodway Protection Section
Division of Flood Management

cc:

Governor's Office of Planning and Research
State Clearinghouse
1400 Tenth Street, Room 121
Sacramento, CA 95814

Letter S4 Response	California Office of Planning and Research Terry Roberts, Director, State Clearinghouse April 7, 2009

S4-1 Comment noted; the State Clearinghouse acknowledges that SAFCA has complied with review requirements for draft environmental documents pursuant to CEQA.

S4-2 See Response to Comment S1-1.

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California Natural Resources Agency
DEPARTMENT OF FISH AND GAME
http://www.dfg.ca.gov
North Central Region
1701 Nimbus Road, Suite A
Rancho Cordova, CA 95670
916-358-2900

ARNOLD SCHWARZENEGGER, Governor

S5

April 9, 2009

John Bassett
Sacramento Area Flood Control Agency
1007 Seventh Street, 7th Floor
Sacramento, CA 95814

Subject: Comments on the Sacramento Area Flood Control Agency's February 2009, Draft Environmental Impact Report on the Natomas Levee Improvement Program Phase 3 Landside Improvement Project

Dear Mr. Bassett:

The California Department of Fish and Game (DFG) has reviewed the Sacramento Area Flood Control Agency's (SAFCA) February 2009, Draft Environmental Impact Report on the proposed Natomas Levee Improvement Program Phase 3 Landside Improvement Project (DEIR/EIS). As described in the DEIR/EIS, the project objectives include: 1) provide at least a 100-year level of flood protection to the Natomas Basin as quickly as possible, 2) provide "200-year" protection to the Natomas Basin over time, and 3) avoid any substantial increase in expected annual damages as new development occurs in the Basin. S5-1

The DFG is providing comments on the DEIR/EIS as a trustee agency and a responsible agency. As trustee for the State's fish and wildlife resources, the DFG has jurisdiction over the conservation, protection, and management of fish, wildlife, native plants, and the habitat necessary for biologically sustainable populations of such species. In this capacity the DFG administers the California Endangered Species Act (CESA), the Native Plant Protection Act (NPPA), and other provisions of the California Fish and Game Code that afford protection to the State's fish and wildlife public trust resources. As a responsible agency the DFG will review a Lake and Stream Alteration Agreement notification package for components of the proposed project.

Enforceable Mitigation Measures

CEQA Guidelines §§15126.4 (a)(1)(B) states that formulation of mitigation measures should not be deferred until some future time. Table ES-2 lists a number of mitigation measures for fisheries and aquatic resources (i.e. mitigation measures 4.6a and 4.7a), terrestrial biological resources (i.e. mitigation measures 4.8a, 4.8b, 4.9a, 4.9c, and 4.9f) that rely on future approvals or agreements with the Wildlife Agencies. These entities are entrusted with carrying out the Natomas Basin Habitat Conservation Program's (NBHCP's) permit conditions, Natomas Basin Conservancy (NBC), and agencies entrusted with providing public safety (Federal Aviation Administration (FAA) approval over mitigation on proposed borrow site / Sacramento Airport buffer lands), as a means S5-2

Conserving California's Wildlife Since 1870

to bring identified significant environmental effects to below a level that is significant. As there is no guarantee that these approvals or cooperation with all of the above entities will ultimately occur, the DFG believes the above mitigation measures are potentially unenforceable and may not bring the impacts to fisheries and aquatic resources to below a level that is significant. S5-2 Cont'd

Mitigation measures should establish performance standards to evaluate the success of the proposed mitigation, provide a range of options to achieve the performance standards, and must commit the lead agency to successful completion of the mitigation. Mitigation measures should also describe when the mitigation measure will be implemented and explain why the measure is feasible. The DFG recommends the mitigation measures summarized in Table ES-2, include measures that are enforceable and do not defer mitigation details to some future time. The DEIR/EIS should identify the following items: how each measure will be carried out; who will perform the measures; when the measures will be performed; the performance standards and mechanisms for achieving success; and an assured source of funding to acquire and manage identified mitigation lands. The DEIR/EIS could describe a range of enforceable mitigation measures that will be implemented in instances where approval and cooperation with the entities identified above either does or does not occur. S5-3

CESA

As we have done for previous phases of this project, the Department anticipates issuing an Incidental Take Permit (ITP) for this phase under the provisions of the California Endangered Species Act. Issuance of an ITP is subject to CEQA documentation. Because of this, it is critical that the CEQA analysis and the identification of specific mitigation measures be as thorough as possible in the EIR in order for us to be able to rely on the existing environmental document when making our CEQA findings for the ITP. The DFG may only issue a CESA permit if it is determined that impacts associated with the authorized take of the species are minimized, fully mitigated, and that adequate funding has been ensured to implement the mitigation measures. The DFG may only issue a CESA permit if it determines that issuance of the permit will not jeopardize the continued existence of the species. This determination will be made based on the best scientific information available and shall include consideration of the species capability to survive and reproduce, including the species known population trends and known threats to the species. Issuance of a CESA permit may take up to 180 days from receipt of an application for take authorization. S5-4

Potential Impacts to Special-Status Plant Species

The DEIR/EIS states that three special-status plant species have the potential to occur within the project area, including Rose Mallow (*Hibiscus lasiocarpus*), Delta Tule Pea (*Lathyrus jepsonii* var. *jepsonii*), and Sanford's Arrowhead (*Sagittaria sanfordii*). The DEIR/EIS states: "no surveys have been conducted to confirm that the species in question are present in these habitats; however, surveys for special-status plants within the Phase 3 Project area will be conducted during the appropriate time for identification in 2009, before project construction". The DFG recommends focused rare-plant surveys be conducted at the appropriate time of year to identify any special-status plants which may be present within the project area. The results of these floristic S5-5

surveys need to be evaluated in the final EIR/EIS along with appropriate minimization and mitigation measures. Compliance with CEQA is predicated on a complete and accurate description of the existing site conditions that will be altered if the proposed project is approved. Without a complete and accurate description of the existing plant flora in and around the project site the DEIR/EIS likely provides an incomplete analysis of project-related environmental impacts. S5-5 Cont'd

Mitigation measure 4.9a of the DEIR/EIS states: "if special-status plants are present in areas that cannot be avoided... affected plants may potentially be transplanted to the GGS/Drainage Canal, if feasible". The DFG has found transplantation of herbaceous plants is typically unsuccessful and should be considered experimental. Mitigation measures for any potentially unavoidable impacts to special-status plants should include additional measures to increase the chances of survival for the population in question. If special-status plants cannot be avoided during project activities, seed should be collected and propagated at a DFG approved nursery facility in order to provide additional plantings at an approved mitigation site. Additionally, a mitigation plan approved by the DFG should be developed, which includes a planting plan, monitoring plan, success criteria, and a remediation plan in the event that success criteria are not met. These mitigation sites should be permanently protected and managed in perpetuity. S5-6

Impacts to Swainson's Hawk and Other Raptor Species

The DFG is concerned with potential impacts to raptor nesting behavior not currently addressed in the DEIR/DEIS. Page 2-25 of the DEIR/DEIS describes construction activities including the 24/7 construction of cutoff walls before the start of flood season (November 1), as well as an estimated 900-1,000 haul trips per day to deliver fill material to construct reaches 5A-9B of the Sacramento River east levee. The DFG believes that each of these activities could potentially result in significant impacts to nesting raptors including nest abandonment, starvation of young, and/or reduced health and vigor of eggs or nestlings that could result in death.

The final EIR/EIS should identify the potential impacts to nesting raptors associated with 24-hour construction schedules along riparian zones such as the Sacramento River, which contains a higher density of nesting raptors than elsewhere in the Natomas Basin. In its current form the DEIR/DEIS does not explore the potential impacts of nighttime construction activities on nesting raptors such as: high-intensity lighting, operation of heavy equipment or the presence of construction personnel at all hours of the night. Furthermore, construction at night poses additional complications for the effectiveness of biological monitors in ensuring that appropriate buffer zones are in place around active nests and that birds do not abandon their nest. The final EIR/EIS should include feasible mitigation measures that reduce these impacts to below a level of significance. S5-7

Mitigation measure 4.9f states: "surveys for nesting birds shall be conducted before project activities are initiated during the nesting season (March 1-July 31)". The DFG recommends that nesting bird surveys be conducted until September 15th, in accord with current DFG survey protocols for nesting birds. Additionally, mitigation measure 4.9f states: "the biologist shall conduct preconstruction surveys to identify active nests S5-8

within 0.25-mile of construction areas, in accordance with DFG guidelines". Current DFG guidelines require preconstruction surveys be conducted within 0.5-miles of construction areas, with a 0.25-mile construction buffer zone placed around any active nest that is identified.

S5-8 Cont'd

Northern Harrier

The Northern Harrier (*Circus cyaneus)* (NOHA) is listed in California as a Species of Special Concern, and is protected from take by Fish and Game section 3503.5. The DEIR/EIS does not provide a discussion of potential impacts to these ground nesting raptors associated with construction and borrow site activities and does not consider avoidance or mitigation measures to avoid "take" or lessen potential impacts to below a level that is significant. The DFG recommends that the DEIR/EIS provide a discussion of the project's potential to impact NOHA, and include measures to avoid take of these birds, and their nests and eggs.

S5-9

We appreciate your consideration of our comments. DFG personnel are available for consultation regarding biological resources and strategies to minimize impacts. If you have questions please contact Patrick Moeszinger, Environmental Scientist, at 916-358-2850 or Jeff Drongesen, Senior Environmental Scientist, at 916-358-2919.

Sincerely,

Kent Smith
Habitat Conservation Program Manager

cc: Patrick Moeszinger
Jeff Drongesen
Kent Smith
Department of Fish and Game
North Central Region

USFWS
2800 Cottage Way, W-2606
Sacramento, CA 95825

S5-1 Comment noted; DFG is providing comments as a trustee agency and responsible agency under CEQA.

S5-2 **Table 3-2** includes permits and other resource agency coordination activities for current and future NLIP project construction phases.

Table 3-2
NLIP Resource Agency Coordination

Agency	Regulatory Permit/Issue	Status
Programmatic		
USFWS/NMFS	Programmatic Biological Opinion	Issued October 2008
NMFS	Concurrence of Determination of Not Likely to Adversely Affect	January 2009
DFG, RWQCB, USACE, and USFWS	Long Term Management Plan Approval	Under Review
Phase 2 Project		
USACE	Section 408 Permission	Issued January 2009
USACE	Section 404 Permit	Issued January 2009
RWQCB	Section 401 Water Quality Certification	Issued January 2009
DFG	2081 Incidental-Take Authorization	Expected April 2009
DFG	1602 Streambed Alteration Agreement	Signed and issued January 2009
USFWS/NMFS	Biological Opinion	Issued October 9, 2008
Sacramento County	SMARA Exemption	February 2009
Sutter County	SMARA Exemption	February 2009
DFG, RWQCB, USACE, and USFWS	MMP	Under review
SWRCB	Section 402 NPDES Permit	Notice of Intent filed March 2009
Phase 3 Project[2]		
USACE	Section 408 Permission	Under review
USACE	Section 404 Permit	Under review
USACE	Section 10 Permit	Under review
RWQCB	Section 401 Water Quality Certification	In preparation
DFG	2081 Incidental Take Authorization	In preparation
DFG	1602 Streambed Alteration Agreement	In preparation
USFWS/NMFS	Biological Opinion	Biological Assessment under review

Table 3-2 NLIP Resource Agency Coordination		
Agency	**Regulatory Permit/Issue**	**Status**
Sacramento County	SMARA Exemption	In preparation
Sutter County	SMARA Exemption	In preparation
DFG, RWQCB, USACE, and USFWS	MMP	In preparation
SWRCB	Section 402 NPDES Permit	In preparation
Phase 4a Project		
USACE	Section 408 Permission	Anticipated January 2010
USACE	Section 404 Permit	Anticipated January 2010
USACE	Section 10 Permit	Anticipated January 2010
RWQCB	Section 401 Water Quality Certification	Anticipated January 2010
DFG	2081 Incidental Take Authorization	Anticipated January 2010
DFG	1602 Streambed Alteration Agreement	Anticipated January 2010
USFWS/NMFS	Biological Opinion	Anticipated November 2009
Sacramento County	SMARA Exemptions or Permit	In preparation
DFG, RWQCB, USACE, and USFWS	MMP	Anticipated January 2010
SWRCB	Section 402 NPDES Permit	Anticipated January 2010
Phase 4b and 4c Projects – Anticipated 2010-2012		

Notes: USFWS = U.S. Fish and Wildlife Service; NMFS = National Marine Fisheries Service; DFG = California Department of Fish and Game; RWQCB = Regional Water Quality Control Board; USACE = U.S. Army Corps of Engineers; SMARA = Surface Mining and Reclamation Act; MMP = Mitigation and Monitoring Plan; SWRCB = State Water Resources Control Board; NPDES = National Pollutant Discharge Elimination System

[1] Although Phase 1 Project permitting requirements were fulfilled, they are not included in this table because construction is complete.

[2] The Phase 3 Project permits have been separated into 3 subphases (a, b, and c); status listed in table refers to the Phase 3a permit.

Source: Data compiled by EDAW in 2009

It is common to receive permits from these agencies, in their capacities as responsible agencies, after an FEIR is certified. The BOs and incidental take permit, which will contain specific conditions to protect species at a higher performance standard than exists under CEQA ("take" versus no substantial effect), specify that implementation is the responsibility of SAFCA, and establish measurable parameters (performance standards) and actions that SAFCA will be required to implement if the parameters are not met. USFWS, NMFS, and DFG permits include specific and stringent performance standards. These agency documents are not studies, but permits with legally binding and enforceable terms and conditions. If SAFCA does not receive permits from these agencies, SAFCA simply cannot implement the Proposed Action. Permit terms in USFWS, NMFS, and DFG permits are enforceable and must be complied with by SAFCA. The established mitigation in the Phase 3 DEIS/DEIR does not constitute impermissible "deferred mitigation" and meets CEQA requirements for effective and legally adequate mitigation. The following discussion provides additional supportive information.

Impacts to wildlife habitat from project construction would be compensated for through a Natomas Basinwide habitat creation, enhancement, and preservation component as part of the NLIP (See Section 2.3.3, "Habitat Conservation Components," in the Phase 3 DEIS/DEIR). These components include creation and/or preservation of managed grasslands, aquatic habitat, uplands, woodlands, field crops, and rice that function as wildlife habitat. This conservation strategy is designed to offset impacts to habitat and to contribute towards long-term viability of the giant garter snake, valley elderberry longhorn beetle, Swainson's hawk, and other nesting raptors and songbirds. Therefore, these conservation components are not "mitigation measures;" rather, they are part of the Proposed Action. Nevertheless, these aspects of the Phase 3 Project will still meet the same requirements of enforceability and approval by permitting agencies as they would if they were mitigation measures. The conservation strategy was designed to meet all the requirements of mitigation specified in the State CEQA Guidelines.

As stated in State CEQA Guidelines (Section 15126.4[a][1][B]), "formulation of mitigation measures should not be deferred until some future time. However, measures may specify performance standards which would mitigate the significant effect of the project and which may be accomplished in more than one specified way." Hence, mitigation measures commonly are adopted in which the agency commits to achieving a performance standard and the mitigation measure lists options and alternatives for achieving the performance standard, some or all of which may be selected for implementation as part of a future, specific mitigation or management plan.

S5-3 Section 2.3.3, "Habitat Conservation Components," in the Phase 3 DEIS/DEIR includes performance criteria for assessing the success of conservation components along with how and when assessment monitoring would be carried out for aquatic habitat, rice and field crops, managed grasslands, and woodlands.

Further description of these conservation components and how they are expected to function can be found in Sections 4.8, "Vegetation and Wildlife," and 4.9, "Special-Status Terrestrial Species," in the Phase 3 DEIS/DEIR under the Proposed Action. Construction details for the proposed GGS/Drainage Canal can be found in Appendix H of the Phase 3 DEIS/DEIR along with dates for completion.

See also Section 2.3.3.6, "Long-Term Management of Habitat Components," in the Phase 3 DEIS/DEIR for a description of land protection and management mechanisms for long-term management of conservation components. Construction of conservation components and assessment monitoring will be carried out by SAFCA or its contractors.

The Draft NLIP Landside Improvements Project Programmatic Long-Term Management Plan (LTMP) and the NLIP Phase 3 Mitigation and Monitoring Plan (MMP) provide further details for ensuring that habitat improvement and compensation sites are managed, monitored, and maintained in perpetuity. The completion of these documents is expected by June 2009. Funding agreements for proposed parties responsible for management are detailed in the LTMP and MMP. Before project construction that could affect agency-regulated habitat can begin, permits must be issued by the applicable resource/regulatory agencies, and the LTMP and MMP documents are subject to their approval. Management responsibilities and protection obligations under these plans will be held by USFWS, DFG, SAFCA, TNBC, Sacramento County, Sacramento County Airport System (SCAS), the Natomas Central Mutual Water Company (NCMWC), and RD 1000.

S5-4 SAFCA acknowledges the Proposed Action could result in take of giant garter snake and Swainson's hawk, and that a California Endangered Species Act (CESA) 2081 Permit is required for these species. SAFCA will fully comply with the CESA permitting process, including

necessary compensation/mitigation for impacts to state-listed species, funding for said compensation/mitigation, and the amount of time potentially required for issuing a permit.

S5-5 Mitigation Measure 4.9-a, "Conduct Focused Surveys for Special-Status Plants, Minimize Effects, and Develop Detailed Design of Created Habitat and Management Agreements to Ensure Compensation for Loss of Habitat, and Implement all Management Agreements," in the Phase 3 DEIS/DEIR includes conducting plant surveys at the appropriate time of year to identify any special-status species in the area, ensures no net loss of special-status species if they are found, and includes consultation with appropriate regulatory agencies including DFG. These surveys are planned for the appropriate blooming season in June/July 2009, which is after the FEIR is completed. DFG will be notified of all results of the special-status plant surveys when the surveys are conducted.

Preconstruction surveys must take place immediately prior to construction activities. When preconstruction surveys are coupled with specific actions to be taken if the species are found, and there are specific performance standards established, then the mitigation is adequate under CEQA.

S5-6 SAFCA understands that transplanting herbaceous plants can be unsuccessful. If surveys indicate that special-status plants would be lost as a result of project implementation, Mitigation Measure 4.9-a, "Conduct Focused Surveys for Special-Status Plants, Minimize Effects, and Develop Detailed Design of Created Habitat and Management Agreements to Ensure Compensation for Loss of Habitat, and Implement all Management Agreements," is revised to include the following: SAFCA commits to implement additional measures to increase the chance of success for establishment of special-status plant populations in created habitats, such as seed collection and propagation at a DFG-approved nursery to provide additional plantings and conducting transplantation during the dormant season, if feasible, to an approved site. SAFCA will develop a mitigation plan to be approved by DFG, and mitigation lands will be protected and managed in perpetuity, as recommended. See Chapter 4.0, "Revisions to the DEIS/DEIR," of this FEIR for the text revision.

S5-7 Mitigation Measure 4.9-f, "Minimize Potential Impacts on Swainson's Hawk and Other Special-Status Birds Foraging and Nesting Habitat, Monitor Active Nests during Construction, Develop and Implement a Management Plan in Consultation with DFG, Obtain Incidental Take Authorization, and Implement Mitigation Measure 4.8-a, [Minimize Effects on Woodland Habitat, Complete Detailed Design of Woodland Creation and Management Agreements to Ensure Compensation for Loss of Quantity and Quality of Habitat, Implement all Agreements, and Comply with the DFG Section 1602 Permit Process]," in the Phase 3 DEIS/DEIR is intended to (1) be encompassing enough to mitigate any and all construction activities, day or night, (2) provide for monitoring to identify any unanticipated nest disturbance, and (3) provide flexibility to determine an appropriate course of action in consultation with DFG if unanticipated effects occur. This measure addresses any impacts that may occur from 24/7 construction and haul trips.

S5-8 Mitigation Measure 4.9-f, "Minimize Potential Impacts on Swainson's Hawk and Other Special-Status Birds Foraging and Nesting Habitat, Monitor Active Nests during Construction, Develop and Implement a Management Plan in Consultation with DFG, Obtain Incidental Take Authorization, and Implement Mitigation Measure 4.8-a, [Minimize Effects on Woodland Habitat, Complete Detailed Design of Woodland Creation and Management Agreements to Ensure Compensation for Loss of Quantity and Quality of Habitat, Implement all Agreements, and Comply with the DFG Section 1602 Permit Process]," in the Phase 3 DEIS/DEIR has been revised to reflect these updates to DFG protocol for nesting raptors. See Chapter 4.0, "Revisions to the DEIS/DEIR," of this FEIR for the text revision.

S5-9 The northern harrier is discussed as a special-status species in Section 3.3.9.2, "Special-Status Wildlife Species," and in Table 3.9-2 in the Phase 3 DEIS/DEIR. Impacts 4.7-a, "Impacts on Jurisdictional Waters of the United States," and 4.9-f, "Impacts on Swainson's Hawk and Other Special-Status Birds," in the Phase 3 DEIS/DEIR describe and evaluate the Phase 3 Project's potential impacts to potential nesting habitat for Swainson's hawk and other special-status birds, including grasslands, croplands, and marsh. To provide additional clarification, northern harrier will be specifically identified in Impact 4.9-f as a special-status bird. See Chapter 4.0, "Revisions to the DEIS/DEIR," of this FEIR for the text revision.

Mitigation Measure 4.9-f, "Minimize Potential Impacts on Swainson's Hawk and Other Special-Status Birds Foraging and Nesting Habitat, Monitor Active Nests during Construction, Develop and Implement a Management Plan in Consultation with DFG, Obtain Incidental Take Authorization, and Implement Mitigation Measure 4.8-a, [Minimize Effects on Woodland Habitat, Complete Detailed Design of Woodland Creation and Management Agreements to Ensure Compensation for Loss of Quantity and Quality of Habitat, Implement all Agreements, and Comply with the DFG Section 1602 Permit Process]," provides measures that cover surveys and avoidance for all nesting special-status birds, including the northern harrier. Focused transect surveys will be used to survey for northern harrier nests. If an occupied nest is found, this measure requires developing an appropriate buffer that minimizes potential disturbance of the nest to be determined by the biologist and in coordination with DFG.

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SACRAMENTO METROPOLITAN
AIR QUALITY
MANAGEMENT DISTRICT

L1

Larry Greene
AIR POLLUTION CONTROL OFFICER

March 18, 2009

Mr. John Bassett
Director of Engineering
Sacramento Area Flood Control Agency (SAFCA)
1007 Seventh Street, 7th Floor
Sacramento, CA 95814

Ms. Elizabeth Holland
Planning Division
USACE, Sacramento District
1325 J Street
Sacramento, CA 95814

Natomas Levee Improvement Program (NLIP), Phase 3 Landside Improvements Project DEIS/DEIR, SAC200701184c

Dear Mr. Bassett and Ms. Holland:

Thank you for providing the NLIP Phase 3 Landside Improvements Project DEIS/DEIR to the Sacramento Metropolitan Air Quality Management District (SMAQMD) for review. SMAQMD staff comments follow.

1. Page 4.13-9, last paragraph, indicates "SAFCA will submit a construction emissions dust control plan(s) to SMAQMD...and shall receive approval of the plan(s)." Generally, the SMAQMD does not review and approve dust control plans unless the construction is located in an area of known naturally occurring asbestos. The SMAQMD supports the development and implementation of the plan to ensure the project complies with SMAQMD rules and reduces particulate emissions. L1-1
2. Page 4.13-10, fourth bullet, discusses an off-site mitigation fee. Recognizing the estimate in the document is just that, the SMAQMD supports the approach to recalculate the emissions and mitigation fee prior to groundbreaking activities for each project phase. L1-2
3. Page 4.13-11, last bullet, indicates idling time shall be limited to 10 minutes. State law for most sectors of diesel-fueled equipment allows only 5 minutes of idling. L1-3
4. Page 4.13-12, first bullet, indicates diesel-fueled construction equipment operating on the site for more than 40 hours shall be equipped with diesel particulate filters (DPFs) that meet ARB level 3 verification. The SMAQMD doesn't believe that it is currently feasible for all construction equipment to be equipped with level 3 DFPs. There are less than 10 verified devices currently listed on ARB's webpage, but not all of these devices will work on all pieces of construction equipment. The SMAQMD recommends that this measure be replaced with either a certain number (i.e., 2-5) or percentage of pieces of equipment be retrofitted, or go in a different direction and require only construction equipment with tier 2 or higher certified engines be used on the project, unless the tier 0 or tier 1 engine is retrofitted with ARB certified level 3 diesel particulate filters. L1-4

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www.airquality.org

5. Page 4.13-13, there are two references to Table 4.13-3. One reference indicates the emissions in the table are from the Levee Raise-in-Place Alternative and the other reference indicates the emissions in the table are from the Proposed Action. Please clarify which reference is correct and if necessary provide a separate emissions table for the other reference. L1-5

All projects are subject to SMAQMD rules in effect at the time of construction. I have attached a list of rules that may apply to this project. For more information on SMAQMD rules call 916-874-4800 or visit www.AirQuality.org. L1-6

Please contact me at 916-874-4881 or khuss@airquality.org if you have any questions regarding these comments.

Sincerely,

Karen Huss

Karen Huss
Associate Air Quality Planner/Analyst

Attachment

Cc: Larry Robinson, Sacramento Metropolitan Air Quality Management District
Sondra Andersson, Feather River Air Quality Management District

SMAQMD Rules & Regulations Statement (revised 1/07)

The following statement is recommended as standard condition of approval or construction document language for **all** development projects within the Sacramento Metropolitan Air Quality Management District (SMAQMD):

All projects are subject to SMAQMD rules and regulations in effect at the time of construction. A complete listing of current rules is available at www.airquality.org or by calling 916.874.4800. Specific rules that may relate to construction activities or building design may include, but are not limited to:

Rule 201: General Permit Requirements. Any project that includes the use of equipment capable of releasing emissions to the atmosphere may require permit(s) from SMAQMD prior to equipment operation. The applicant, developer, or operator of a project that includes an emergency generator, boiler, or heater should contact the District early to determine if a permit is required, and to begin the permit application process. Portable construction equipment (e.g. generators, compressors, pile drivers, lighting equipment, etc) with an internal combustion engine over 50 horsepower are required to have a SMAQMD permit or a California Air Resources Board portable equipment registration.

Other general types of uses that require a permit include dry cleaners, gasoline stations, spray booths, and operations that generate airborne particulate emissions.

Rule 403: Fugitive Dust. The developer or contractor is required to control dust emissions from earth moving activities or any other construction activity to prevent airborne dust from leaving the project site.

Rule 417: Wood Burning Appliances. Effective October 26, 2007, this rule prohibits the installation of any new, permanently installed, indoor or outdoor, uncontrolled fireplaces in new or existing developments.

Rule 442: Architectural Coatings. The developer or contractor is required to use coatings that comply with the volatile organic compound content limits specified in the rule.

Rule 902: Asbestos. The developer or contractor is required to notify SMAQMD of any regulated renovation or demolition activity. Rule 902 contains specific requirements for surveying, notification, removal, and disposal of asbestos containing material.

Letter	Sacramento Metropolitan Air Quality Management District
L1	Karen Huss, Associate Air Quality Planner/Analyst
Response	March 18, 2009

L1-1 Comment noted; the Sacramento Metropolitan Air Quality Management District (SMAQMD) does not review and approve dust control plans, however, SMAQMD does support the development and implementation of such plans. The fugitive dust control plan shall remain in the Phase 3 DEIS/DEIR as written (see Mitigation Measure 4.13-a, "Implement Applicable District-Recommended Control Measures to Minimize Temporary Emissions of ROG, NO_X, and PM_{10} during Construction"), however the dust control plan will not require SMAQMD approval for implementation. See Chapter 4.0, "Revisions to the DEIS/DEIR," of this FEIR for the text revision.

L1-2 Comment noted; SMAQMD supports the existing methodology and timing of the off-site mitigation fee.

L1-3 The commenter states that idling should be limited to 5 minutes for diesel-fueled equipment. See Chapter 4.0, "Revisions to the DEIS/DEIR," of this FEIR for the text revision.

L1-4 The commenter states that mitigation in the form of diesel particulate filters may not be feasible at this time and recommends substitute measures. See Chapter 4.0, "Revisions to the DEIS/DEIR," of this FEIR for the text revision.

L1-5 Because only the Proposed Action is required to meet general conformity de minimis thresholds, Table 4.13-3 in the Phase 3 DEIS/DEIR only presents the annual Proposed Action emissions.

L1-6 Comment noted; all projects are subject to SMAQMD rules at the time of construction. The impact discussion and mitigation measures in the Phase 3 DEIS/DEIR require that SAFCA will comply with SMAQMD rules in place at the time of construction.

L2

From: Neal Hay [mailto:NHay@co.sutter.ca.us]
Sent: Friday, April 03, 2009 5:13 PM
To: Bassett. John (MSA)
Cc: Al Sawyer
Subject: SAFCA NLIP Phase 3 Landside Improvements

Mr. Bassett, Director of Engineering,

In reviewing the draft EIS / EIR for the above mentioned project, under the proposed action for Mitigation Measure 4.12-a, Sutter County requests that the EIS / EIR mention the agreement between Sutter County and SAFCA for road repairs dated August 21, 2008. L2-1

Neal P Hay PE
Associate Civil Engineer
Sutter County
530-822-4402 Direct

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If you are not the intended recipient, please contact the sender immediately and permanently delete the original and any copies of this email and any attachments thereto.

Sutter County
Neal P. Hay, PE, Associate Civil Engineer
April 3, 2009

L2-1 SAFCA will, as the commenter requests, coordinate with Sutter County for its review and approval of roadway improvement plans. Mitigation Measure 4.12-a, "Prepare and Implement a Traffic Safety and Control Plan for Construction-Related Truck Trips," in the Phase 3 DEIS/DEIR states that before the start of the first construction season, SAFCA shall coordinate with Sacramento and Sutter Counties and the City of Sacramento to address maintenance and repair of affected roadways resulting from increased truck traffic. This would include public roadways that may be modified as part of the Phase 3 Project.

L3

RECLAMATION DISTRICT 2035

Conaway PRESERVATION GROUP

April 6, 2009

BY U.S. MAIL AND ELECTRONIC MAIL

Elizabeth.G.Holland@usace.army.mil
Elizabeth Holland
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1325 J Street
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BassettJ@saccounty.net
John Bassett
Director of Engineering
Sacramento Area Flood Control Agency
1007 7th Street, 7th Floor
Sacramento, CA 95814

Re: *Comments on EIS/EIR for Natomas Levee Improvement Program, Phase 3 Landside Improvements Project*

Dear Ms. Holland and Mr. Bassett:

This letter provides comments from Reclamation District 2035 ("RD 2035") and the Conaway Preservation Group, LLC, ("Conaway") regarding the Sacramento Area Flood Control Agency's ("SAFCA") and United States Army Corps of Engineers' ("Corps") joint Draft Environmental Impact Statement / Environmental Impact Report ("EIS/EIR").

RD 2035 and Conaway are gravely concerned about SAFCA and the Corps' proposed levee improvements to only the Sacramento River east side levees. RD 2035 and Conaway have made this known to both agencies in repeated comment letters on the myriad environmental documents and segmented and sequential approvals that have been prepared over the past several years in violation of the California Environmental Quality Act ("CEQA") and the National Environmental Policy Act ("NEPA"). Unfortunately, RD 2035's and Conaway's comments have not received appropriate consideration and both agencies continue headlong down the path of project implementation despite the short-sided and parochial nature of the project, which seeks to protect only the Natomas basin at the expense of lands in Yolo County. Accordingly, all previous comments submitted by RD 2035 and Conaway regarding either landside or waterside improvements are herein incorporated by reference as issues related to the current "project" under review. These comments are included in the attached letters previously submitted to SAFCA and/or the Corps.

L3-1

L3-2

I. Reclamation District 2035

RD 2035 was formed in 1919 to provide levee maintenance and drainage services to approximately 20,500 acres of land in Yolo County near the City of Woodland. RD 2035 is a local public entity that has legal authority and jurisdiction under Water Code section 50000 *et seq*. to implement flood control programs and projects that reconstruct, replace, improve, or add to facilities as defined in Public Resources Code section 5096.805(j). RD 2035's service area includes the Conaway Ranch property. The Conaway Ranch covers over 17,000 acres on the west side of the Sacramento River between the cities of Davis and Woodland. Approximately 40 percent of the Ranch is located within the Yolo Bypass and the remainder lies west of the bypass. Both RD 2035 and the Conaway Preservation Group, LLC, which manages the Conaway Ranch, are actively involved in encouraging and seeking solutions to the region's flood problems while conserving open space, agriculture, and rural and environmental values. L3-3

II. SAFCA And The Corps Have Improperly Segmented Environmental Review

RD 2035 and Conaway have repeatedly commented to both SAFCA and the Corps regarding the Natomas Levee Improvement Program ("NLIP"), which has undergone a confusing series of public reviews and documentation. RD 2035 and Conaway continue to be concerned about the piecemeal nature of this review, which has essentially segmented the environmental analysis, thereby obscuring the total effects of the project from public review and disclosure. Such circumscribed analysis is contrary to both the National Environmental Policy Act ("NEPA") and the California Environmental Quality Act ("CEQA"). The piecemeal / segmentation issue was amply discussed in previous letters sent to both the Corps and SAFCA. L3-4

Because of the piecemeal nature of review, the EIS/EIR under review here fails to analyze entire portions of the overall project dealing with in-river changes to the Sacramento River east levees. SAFCA and the Corps will no doubt respond that these were and will be analyzed in other documents, but this answer underscores the problem with such a piecemeal review – analyses become lost in a confusing array of documentation that obscures and neglects overall project impacts, which defeats informed public review and decision making.

III. The EIS/EIR Improperly Discounts Its Contribution To Growth And Cumulative Impacts

Clearly, the NLIP will affect growth by making a large area of Natomas feasible to develop by conferring levels of flood protection generally required to gain approval and commercially build and market such urban development. Nevertheless, the EIS/EIR attempts to avoid the causal link between this project and urban growth by maintaining that such growth is projected to occur regardless of the implementation of the NLIP. Thus, the EIS/EIR concludes that the NLIP would only "accommodate" growth. However, even under this rationale, the EIS/EIR must consider the type of growth that the NLIP would accommodate compared to what L3-5

would otherwise occur. For instance, the environmental effects of continued development of the Natomas basin should be compared to increased urban infill to accommodate such growth. All growth is not the same, especially if growth occurs in areas that have already been developed versus areas of agricultural land that must be converted, which describes much of the Natomas basin. As an example, residential development in areas near downtown Sacramento, such as the rail yard, would not convert as much agricultural land as a similar degree of development in the Natomas basin. Similarly, urban infill requires many fewer resources and usually causes lesser impacts because infrastructure such as sewer and power lines are in closer proximity. Other impacts of the growth that full build-out of Natomas would create must also be examined and disclosed in more detail in the cumulative impacts section of the EIS/EIR. These include additional impacts to water quality, terrestrial and aquatic habitat, traffic, and greenhouse gas emissions.

L3-5 Cont.

The EIR claims that the expansion of the Natomas urban footprint will be governed by the Natomas Basin Habitat Conservation Plan ("NBHCP"), but the NBHCP does not cover development of much of the northern half of the Natomas basin. Therefore, the EIS/EIR cannot hide behind the NBHCP to avoid a discussion of the impacts of developing those areas. If a proper analysis of sufficient scope and detail is performed, RD 2035 and Conaway believe that the impacts of this growth on environmental and other resources will be significant.

L3-6

Given the EIS/EIR's refusal to acknowledge the actual causal relationship between the NLIP and development of Natomas, much of the cumulative impact analyses are also improperly constrained and therefore inadequate. The EIS/EIR claims that many project impacts will only be temporary and not "operational," but this again fails to account for the impacts of the growth that will be made possible in the Natomas basin.

L3-7

IV. The EIS / EIR Admits That More Comprehensive Solutions Are Underway But Fails To Discuss The Possibility That The NLIP May Preclude These Solutions

Throughout this process, RD 2035 and Conaway have repeatedly urged SAFCA and the Corps to consider the overall flood system and to participate in and contribute to a regional flood solution that protects more than just the Natomas basin (See August 1, 2008 letter attached hereto). Unfortunately, these comments have been countered by SAFCA's reliance on self-imposed, predetermined and unrealistic project schedules which, by design, discourage public understanding and meaningful review of its flood control projects. SAFCA has repeatedly acted as if Natomas will flood tomorrow if it does not proceed with utmost haste, and seems to be using this rationale as justification for ignoring better solutions. The scope and magnitude of this flood control project, especially amidst the backdrop of an even larger, comprehensive flood control project for the Central Valley, requires that SAFCA and the Corps exercise a more deliberate and thoughtful approach to develop a long-lasting and hopefully permanent flood control solution. This is especially true considering the State's FloodSAFE program and the

L3-8

Corps' general review process, which will occur in the next few years and will likely lead to Congressional approvals and funding for area flood projects. L3-8 Cont.

The EIS / EIR at pages 2 – 9 and elsewhere, admits that it is reasonably foreseeable that the State and Federal governments would repair and improve the entire levee system, including Natomas (e.g., see discussion of No Project alternative). Considering that the NLIP will require local matching funds in addition to State and federal funds for construction, implementation of the NLIP expends State, federal and local taxpayers funds without consideration of opportunities for cost savings, and more comprehensive, project alternatives. While socioeconomic impacts are not per se environmental impacts, the reduction in funding available to devote to the comprehensive flood control solution may have real, physical impacts to other areas that are deprived of adequate flood protection. The EIS/EIR currently provides no discussion of these physical impacts, and the potential increased flood risk of other regions, from the expenditure of large funds on the NLIP. L3-9

V. The No Project Alternative Should Be Designated The Environmentally Superior Alternative

The discussion and selection of the proposed project as the environmentally superior alternative in Section 2.6 is not supported by the data presented in Tables 2-3 and 2-4. Also, the conclusion is invalid because the EIS/EIR assumes a flood occurring very soon, instead of appropriately considering that no flood may occur for 100 years or more. If the Natomas basin remains in the AE floodzone classification, land prices will decline and more terrestrial habitat, in fact, might develop. Thus, for terrestrial wildlife and many other resource categories, the No Project alternative would be the environmentally superior alternative because the direct, indirect, and cumulative impacts of urban development that the NLIP will make possible will not occur. (See cumulative impacts comments.) Also, the EIS/EIR repeatedly misstates or overstates the environmental impacts of flooding. Flooding is a natural event that native species have evolved to deal with. Therefore, the EIS/EIR's sweeping conclusion that flooding would be detrimental to environmental resources is unfounded, or based only on a very short-term focus instead of longer-term effects. Proper analysis would likely show that in the long-term, periodic flooding is beneficial to many resource categories because the consensus among scientific and biological research is that a restoration of natural process, including periodic flooding, supports healthy native ecosystems by fostering natural processes, which, for example, discourages colonization and establishment of invasive exotic species. L3-10

VI. The EIS / EIR Includes Far Too Many Significant And Unavoidable Impacts, When In Fact Feasible Mitigation Exists

Given the magnitude and size of the NLIP, the EIS/EIR concludes that no feasible mitigation exists in far too many resource categories. In many of these resources categories, there is no discussion of what mitigation options were considered or why it was concluded they L3-11

are all infeasible. For instance, to offset the conversion of farmland, additional farmland could be purchased and placed in a farm conservation easement. Also the EIS/EIR should disclose what mitigation for cumulative impacts to habitat, traffic, air quality, and water quality impacts associated with the urban development of Natomas were investigated and why they too were dismissed. CEQA requires all feasible mitigation to be adopted.

L3-11 Cont.

VII. The EIS/EIR Fails To Summarize Incorporated Material

In many places, the EIS/EIR incorporates materials from the numerous other CEQA documents SAFCA has prepared. However, the EIS/EIR does not follow the proper procedure for incorporating these previous analyses. Specifically, the EIS/EIR fails to briefly summarize or describe the data or analyses to be incorporated. (Cal. Code of Regs., tit. 14, § 15150(c).) The EIS/EIR also improperly uses the incorporation provision, which is intended for incorporating pieces of documents that provide background or technical discussion, and not to contribute directly to environmental impact analysis. (Cal. Code of Regs., tit. 14, § 15150(f).) Much like the larger segmentation problem with the NLIP analyses, the resort to incorporation by reference is confusing and makes it difficult for the public and decision-makers to adequately review and understand the impacts of the project.

L3-12

VIII. Conclusion

In sum, while RD 2035 and Conaway remain interested in working with SAFCA to resolve regional flood control issues and to develop comprehensive flood protection for the region, RD 2035 cannot accept segmented flood control projects that protect one specific area at the expense of increased flood risks to another. The EIS/EIR must analyze whether or not SAFCA's flood control projects result in increased flood risks to RD 2035 and others in Yolo County. Special legislation obtained by SAFCA to protect it from liability for increasing flood risk to others does not obviate its legal obligation to disclose the potential of such an impact.

L3-13

Sincerely,

REGINA CHEROVSKY
Managing Trustee, RD 2035

TOVEY GIEZENTANNER
President/CEO, Conaway Preservation Group, LLC

Enclosures

913521.1

KRONICK MOSKOVITZ TIEDEMANN & GIRARD

HANSPETER WALTER
hwalter@kmtg.com

August 1, 2008

VIA E-MAIL AND U.S. MAIL

Ms. Kathleen A. Dadey
U.S. Army Corps of Engineers, Sacramento District
1325 J Street, Room 1480
Sacramento, CA 95814
Email – Kathleen.A.Dadey@usace.army.mil

Re: *Comments on Permit Application for Natomas Levee Improvement Project*

Dear Ms. Dadey:

This letter provides comments from Reclamation District 2035 ("RD 2035") regarding the Sacramento Area Flood Control Agency's ("SAFCA") application for a permit under Section 10 of the Rivers and Harbors Act of 1899 for structures or work affecting navigable water and Section 404 of the Clean Water Act for the discharge of dredged or fill material in water of the United States. RD 2035 has several concerns that it wishes to raise with the Corps' permitting staff so that they may be adequately accounted for in the permitting process.

RD 2035 is gravely concerned about SAFCA's proposed levee improvement to only the Sacramento River east side levees. Accordingly, RD 2035 previously submitted NEPA scoping comments and recently submitted a NEPA comment letter to the Corps regarding this action (attached). The requirements of NEPA and the Corps' own permitting process overlap in that both must include a review of the public interest as well as effects to environmental values. Therefore, many of the issues that RD 2035 previously commented on in those letters are applicable to the Corps' review of SAFCA's permit application, and they are therefore incorporated to the extent applicable. This letter highlights some of RD 2035's major concerns to ensure that the Corps addresses them during the permit application review process.

1. Reclamation District 2035

RD 2035 was formed in 1919 to provide levee maintenance and drainage services to approximately 20,500 acres of land in Yolo County near the City of Woodland. RD 2035 is a local public entity that has legal authority and jurisdiction under Water Code section 50000 *et seq.* to implement flood control programs and projects that reconstruct, replace, improve, or add to facilities as defined in Public Resources Code section 5096.805(j). RD 2035's service area includes the Conaway Ranch property. The Conaway Ranch covers over 17,000 acres on the west

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side of the Sacramento River between the cities of Davis and Woodland. Approximately 40 percent of the Ranch is located within the Yolo Bypass and the remainder lies west of the bypass. Both RD 2035 and the Conaway Preservation Group, LLC, which manages the Conaway Ranch, are actively involved in encouraging and seeking solutions to the region's flood problems while conserving open space, agriculture, and rural and environmental values.

II. The Corps Must Evaluate the Threat of Increased Erosion to the Sacramento River's West Levees

In its previous CEQA documents, SAFCA did not classify slight adverse changes in river hydraulics or to flows in the Yolo Bypass as significant impacts. RD 2035 commented that this was improper considering that the west side Sacramento River and Yolo Bypass levees are already under great stress in flood events, making any change to the hydraulics or river elevation significant. Indeed, the catastrophic consequences of a levee failure on any stretch of the Sacramento River leave no room for further increases in river elevation.

Regarding project impacts to river velocity and flow, SAFCA stated that "[s]ome slight increase in scour would result from the increased velocities that could result in surface erosion of exposed soils on the berm areas where vegetation was removed." (Bank Protection Project DEIR at 7-7.) The EIS also does not appear to evaluate the impacts of the scour from increased flows and determine whether this will increase maintenance costs on the Sacramento River west levees. Similarly, the EIS does not evaluate the total cubic volume of fill that SAFCA intends to add to the Sacramento River for all the Natomas levee improvements. The Corps should evaluate these issues and discuss possible mitigation for these effects during the permit application review process.

III. The Corps Should Utilize Its Probabilistic Modeling Method, or Fully Discuss the Limitations of SAFCA's Model

In its scoping comments, RD 2035 urged the Corps to conduct its own, independent modeling and develop its own assumptions and modeling inputs. The EIS appears to underscore this comment in its candid disclosure that:

> SAFCA's approach to defining level of protection (system performance) differs from that of the USACE. References in this document to levels of protection are based on SAFCA's deterministic approach (the current FEMA method) and should not be taken as USACE concurrence that such levels will be achieved when the USACE probabilistic approach is utilized to define system performance. (EIS at 1-4)

KRONICK MOSKOVITZ TIEDEMANN & GIRARD

This text discloses a difference between SAFCA and the Corps' flood risk modeling, but it does not provide full disclosure as to what this potential difference means to the NEPA analysis. Given this difference, it is unclear why the EIS adopts SAFCA's project objective of 100-year protection based on the SAFCA model, not the Corps model. The Corps should determine its own objective for the action, or alternatively convert the SAFCA objective into its modeling method.

Even if adopting SAFCA's modeling method were appropriate, the EIS did not explain how accurate and precise the UNET model used in this analysis is in detecting slight river and bypass elevation changes, or other metrics like river velocity and erosion or scouring potential. For instance, the EIS did not explain the confidence interval surrounding the model's results and what statistical methods were employed to assess the model's results. Without such information, the Corps will not have a reasoned explanation for why it can rely on SAFCA's model to assess flood risks on either side of the Sacramento River and on that basis issue permits.

IV. The Corps Should Consider The Yolo Bypass Improvement Alternative

The Corps' EIS should not have eliminated the Yolo Bypass Improvement Alternative from consideration without detailed analysis. RD 2035 again urges the Corp to consider alternatives such as the Yolo Bypass Improvement in its public interest analysis during the permitting process. The EIS explained that this alternative was eliminated because it would cost $700 million and because it would not correct freeboard deficiencies and underseepage and through-seepage conditions in Natomas levees. (EIS at ES-6) However, the EIS also reveals that improving the Yolo Bypass:

> [C]ould reduce water surface elevations in the Sacramento River channel during very large floods (100-year or greater) by as much as 3 feet at the mouth of the Natomas Cross Canal (NCC) declining to about 0.5 feet downstream of Interstate 5 (I-5). This would reduce the extent of the levee raising and seepage remediation work that is needed along the NCC south levee, the Sacramento River east levee, and the Pleasant Grove Creek Canal (PGCC) west levee. (EIS at 2-1)

Therefore, the Corps should acknowledge that improvements to the Yolo Bypass would reduce flood risk to a large portion of the region and would also reduce the amount of work necessary on the Natomas levees, especially freeboard deficiencies. This increase in regional flood protection would provide a much better economic return, in terms of reducing flood damage risk. It would also save money by reducing construction and operation and maintenance costs, and also avoid unnecessary environmental impacts, and the use of additional resources such as borrow material. For these reasons, a Yolo Bypass Improvement and the reduced

construction required on the Natomas levees should be evaluated in full. Further justifying this request is the EIS's admission that:

> On a long-term basis, however, regionally oriented improvements to the Yolo and Sacramento Bypass systems would help to address potential changes in hydrology due to climate change and would reduce the risk of uncontrolled flooding on a system-wide basis. . . . [R]educing [flooding] frequency by increasing the conveyance capacity of the SRFCP would avoid the cost of repairing and reconstructing damaged levees and other public infrastructure. . . ." (EIS Appx. A at 16)

There is already an unprecedented amount of State and Federal cooperation and a system-wide solution such as the Yolo Bypass Improvement is already at the door through the State's FloodSAFE effort. RD 2035 urges the Corps not to rush because regional, longer-lasting, and better solutions are imminently forthcoming. Furthermore, SAFCA plans to acquire State and Federal moneys for this project, making the Corps' consideration of the public interest even more important because SAFCA's project has the potential to siphon public moneys away from flood solutions that will provide greater public benefit both by providing broader, regional flood protection and also provide other public benefits such as recreation and fish and wildlife enhancement.

V. The Corps and SAFCA Should Integrate Their Activities With the FloodSAFE Strategic Plan

RD 2035 believes that current State bond funding and anticipated Federal appropriations for flood control, in addition to SAFCA's own bond funds, are more than sufficient to implement a regional, comprehensive solution. However, SAFCA's project threatens to divert State and Federal money, and significant public support from being used to implement a comprehensive solution to the flood threat facing the Sacramento Valley. The Corps and SAFCA should be integrating their activities with the State's current plan to develop a system-wide solution (i.e., FloodSAFE). This is especially so in light of the fact that the proposed action already seems predicated on cooperation from the State and Federal governments. For instance, the EIS explains that:

> SAFCA's early implementation project is running ahead of the GRR submittal date with the expectation that the perimeter levee improvements that are constructed in advance of any Congressional action on the GRR will be found to be consistent with the recommendations contained in the GRR. On that basis, SAFCA anticipates that the non-Federal costs incurred in the early implementa-

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> tion project could be credited against the remaining non-Federal share of the cost of the enlarged Common Features Projects. (EIS at 1-13)

Thus, SAFCA is proceeding with the assumption of being reimbursed by the Federal government. However, "Federal participation in the project will require additional action by Congress based on the results of the GRR as discussed above." (EIS at 1-3) Therefore, the Corps should also assume that a comprehensive flood solution for the region is forthcoming.

The EIS claims that SAFCA's project and this action are entirely consistent with the State Plan of Flood Protection (EIS at 5-30-31), but this is not accurate. Historically, the Natomas Basin was a deep floodplain that stored flood flows, reducing river flows by some amount. Conservation of some of that historic flood storage may be essential to the State's overall flood plan. However, by investing in protecting the entire Natomas Basin and rejecting further analysis of the Natomas Cross Levee alternative, for example, the proposed action likely forecloses consideration of maintaining a portion of the Natomas Basin as a floodplain to help alleviate stress on the levee system during periods of peak flood flows.

For these reasons, RD 2035 believes that a comprehensive solution to the Sacramento Valley's flood problems is the best approach. Such a solution would provide the most benefit to the most people, make best use of public funds, and allow environmental and economic considerations to be fully and properly considered. However, through this EIS, the Corps is following SAFCA's lead in abandoning that comprehensive vision, and not abiding by NEPA's mandate to provide the public and decision-makers with full disclosure of the options available to protect Natomas from flooding and the environmental consequences of each.

VI. If The Corps And SAFCA Increase The Flood Risk To Yolo County, Then They Must Mitigate The Increased Risk

The SRFCP is a comprehensive flood control system designed by the Federal and State governments. All the levees in the system are owned by the Federal or State government. If the Corps and SAFCA, with the cooperation of the State and Federal governments, choose to expend huge amounts of money on only a small portion of the system, then any risk transferred to other portions is the responsibility of the State and Federal governments. The Corps and SAFCA appear to be making a de facto policy choice to neglect and essentially flood the Yolo County side of the Sacramento River instead of improving both sides of the river in a coordinated fashion. If this is the new policy, then the EIS should expressly acknowledge it.

The EIS attempts to explain that "the SRFCP is not intended to provide a uniform level of flood protection . . . to various sub-basins within the protected area." (EIS Appx. A at 3) It also states that "each sub-basin's flood protection is dependent on the fitness of its own levees and

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not on the condition (or failure) of any other sub-basin's levees. Accordingly, each sub-basin has the right to keep its levees in the fittest possible condition." (EIS Appx. A at 3) RD 2035 does not believe that these statements are supported by evidence, nor does it believe that they should serve as guidance during the Corps permit application review process.

RD 2035 believes that the SRFCP was designed to provide system-wide flood protection and to protect both sides of the Sacramento River near Natomas equally. Furthermore, flood risk is an environmental effect that the EIS must discuss, instead of discounting. While government can make a policy choice to increase the risk of flooding, or the depth of flooding, in a particular area, such decisions cannot be done without an evaluation of the environmental effects (here flood risk) and discussion of compensation or other mitigation. The EIS acknowledges this in its discussion of the Reduced Natomas Urban Levee Perimeter, where the alternative is rejected, in part, because it "would cause floodwaters north of the cross levee to be considerably deeper than they would be without the cross levee, and that either flowage easements would need to be acquired on all lands in the basin north of the cross levee or a weir and pumping facilities would need to be constructed to facilitate evacuation of floodwaters." (EIS at 2-2) This same principle applies here, thus the Corps must consider ways to compensate or mitigate the impact of local, State, and Federal agencies deliberately choosing to fund a project that increases the flood risk on the Yolo County side of the Sacramento River instead of using the available funding and political resources to design a comprehensive, system-wide flood solution for both sides of the Sacramento River.

VII. Increasing Risk To Yolo County May Violate Environmental Justice Mandates

The Corps must comply with Executive Order 12898 and identify the disproportionate placement of adverse environmental and social consequences from Federal actions or policies on minority and low-income populations. The policy here of approving permits to improve the Natomas levees while increasing the flood risk to the opposite side will disproportionately affect agricultural regions and portions of Woodland, Yolo County, or Sutter County, which may implicate environmental justice issues.

VIII. The EIS Must Provide More Detail Regarding the Operation And Maintenance of the Natomas Levees

The levees will require continual maintenance, but the EIS provides insufficient detail to understand how continued maintenance of the levees will be achieved in the future. It is crucial that the Corps properly examine how SAFCA intends to provide for long-term maintenance of the levees. Responsibility for maintenance is a vital aspect of the permitting process, as is liability for failure of the levees. Both issues have direct bearing on any Federal cost-benefit analyses that the Corps employs. Regarding this issue, the EIS states:

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> SAFCA would be responsible for the design and construction of all levee improvements . . . [h]owever, once these project features are completed, most of the land or land management responsibility would be conferred by SAFCA to the other management entities described below. Memoranda of agreement, land ownership transfers, or management endowments and contracts would be used by SAFCA to transfer land management responsibility to the appropriate public agency or nonprofit land management organization. At the end of the project construction period, all project lands would be in public ownership and/or would be under the permanent control of a natural resource conservation entity. (EIS at 2-41)

Will SAFCA own the levees after completing the proposed action? Does the term "project lands" include the levees? By use of the term "confer," does this EIS passage indicate that SAFCA will transfer ownership of the Natomas levees to local entities? Will such transfers affect the State and Federal plans for a comprehensive flood control system? How will SAFCA or the Corps ensure that these local entities continue to maintain the Natomas levees?

IX. Other Issues

Climate change – The Corps should consider the contribution of greenhouse gases from the urban growth in Natomas that will be an indirect effect of the action, and which will not occur without approval of this action.

Growth Inducing Effects – The EIS states that essentially no growth will occur without the Corps granting a permit because the Natomas basin will be mapped as a FEMA floodplain, rendering new building economically unviable. However, the EIS does not include a sufficient analysis of all the direct and indirect effects of growth directly attributable to the Corps' proposed permitting action. Instead, the EIS tries to point to other state or local land use plans and laws, but these are not substitutes for NEPA analysis. The Corps must consider the impacts of, and potential mitigation for, the reasonably foreseeable growth in Natomas that this action will essentially cause, which will undoubtedly degrade additional wetlands. This urbanization will likely cause many other changes that will have significant effects to a wide variety of resource categories.

ESA Compliance - The impacts of growth (i.e., development in the floodplain) on the giant garter snake and other ESA-listed species must be considered in the Corp's ESA section 7 consultation on the action because the Natomas Basin HCP did not include a large area of the basin that will be open to development if the entire basin is protected, and because the HCP does not satisfy the Corp's Section 7 obligations.

Stormwater Runoff – The Corps should consider the cumulative anticipated increase in stormwater runoff caused by the urbanization of farmland in Natomas from the growth allowed by this Federal action.

X. Conclusion

RD 2035 remains interested in working with SAFCA and the Corps to resolve regional flood control issues and to develop comprehensive flood protection for the region. RD 2035 also supports flood protection for urbanized areas such as Natomas, but not without assurances that such actions will not affect the current and future flood risks to RD 2035 and that such projects are in the public's interest. RD 2035 appreciates the opportunity to provide the Corps with comments, and will gladly work with SAFCA and the Corps to resolve the issues raised in these comments. If more clarification or other information is needed regarding these comments, please contact me at (916) 321-4500.

Sincerely,

KRONICK, MOSKOVITZ, TIEDEMANN & GIRARD
A Law Corporation

Hanspeter Walter

HW/dg
Enclosures

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July 28, 2008

VIA E-MAIL AND U.S. MAIL

Ms. Elizabeth Holland
Planning Division
U.S. Army Corps of Engineers, Sacramento District
1325 J Street
Sacramento, CA 95814
Email – Elizabeth.G.Holland@usace.army.mil

Re: *Comments on EIS for Natomas Levee Improvement Project*

Dear Ms. Holland:

This letter provides comments from Reclamation District 2035 ("RD 2035") regarding the Army Corps of Engineers' ("Corps") compliance with the National Environmental Policy Act ("NEPA") for the Natomas Levee Improvement Project, which is proposed by the Sacramento Area Flood Control Agency ("SAFCA"). NEPA's central requirement is that federal agencies must, except in certain qualifying situations, complete a detailed environmental impact statement ("EIS") for any major federal action significantly affecting the quality of the human environment. 42 U.S.C. § 4332(2). The current EIS is legally deficient for numerous reasons explained below. Consequently, the Corps should not approve this action until it prepares and recirculates a legally sufficient EIS addressing the identified inadequacies.

RD 2035 previously submitted NEPA scoping comments to the Corps regarding this action (attached as Exhibit 1). Also, RD 2035 provided a detailed comment letter to SAFCA during the California Environmental Quality Act ("CEQA") review process for both its landside and bankside improvements (attached as Exhibit 2). Because many of the previous CEQA issues are applicable to the Corps' NEPA review, RD 2035 incorporates its previous CEQA comments to the extent they apply to the Corps' NEPA requirements for this action.

I. Reclamation District 2035

RD 2035 was formed in 1919 to provide levee maintenance and drainage services to approximately 20,500 acres of land in Yolo County near the City of Woodland. RD 2035 is a local public entity that has legal authority and jurisdiction under Water Code section 50000 *et seq.* to implement flood control programs and projects that reconstruct, replace, improve, or add to facilities as defined in Public Resources Code section 5096.805(j). RD 2035's service area

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includes the Conaway Ranch property. The Conaway Ranch covers over 17,000 acres on the west side of the Sacramento River between the cities of Davis and Woodland. Approximately 40 percent of the Ranch is located within the Yolo Bypass and the remainder lies west of the bypass. Both RD 2035 and the Conaway Preservation Group, LLC, which manages the Conaway Ranch, are actively involved in encouraging and seeking solutions to the region's flood problems while conserving open space, agriculture, and rural and environmental values.

II. The EIS Improperly Piecemeals Environmental Review

RD 2035's scoping comments indicated that SAFCA had divided its CEQA environmental review process into numerous phases and analyzed them in various, separate documents. This was a confusing approach that also failed to disclose and analyze the true environmental effects of the overall program. To avoid similar obfuscation, RD 2035 requested that the Corps provide a NEPA analysis of the whole action. Despite our scoping comments, the Corps has failed to perform this comprehensive analysis and disclosure, and instead has followed SAFCA's lead in presenting an abbreviated and cursory analysis of only a small part of the overall federal action, specifically the granting of permits for only a portion of the overall action. This type of analysis is prohibited by NEPA, and renders the EIS deficient.

The Council on Environmental Quality's (CEQ) regulations implementing NEPA require that an agency consider the effects of "connected actions" within a single EA or EIS. 40 C.F.R. § 1508.25. Effects, for the purposes of the NEPA regulations, "include: (a) [d]irect effects, which are caused by the action and occur at the same time and place," and "(b) [i]ndirect effects, which are caused by the action and are later in time or farther removed in distance, but are still reasonably foreseeable." 40 C.F.R. § 1508.8. Actions are connected if they: (i) Automatically trigger other actions which may require environmental impact statements, (ii) Cannot or will not proceed unless other actions are taken previously or simultaneously, or (iii) Are interdependent parts of a large action and depend on the larger action for their justification. 40 C.F.R. § 1508.25(a)(1). (See, e.g., *Blue Mountains Biodiversity Project v. Blackwood*, 161 F.3d 1208, 1211 (9th Cir.1998), *cert. denied*, 527 U.S. 1003 (1999).)

That the federal permitting for SAFCA's proposed levee work in Natomas is part of one, connected federal action is beyond dispute. The EIS admits that "[t]he NLIP Landside Improvements Project and the NLIP as a whole are part of a larger program of improvements to the flood control system protecting the Sacramento Area that was initiated as part of the American River Watershed Investigation (ARWI) following the record flood of 1986." (EIS at 1-10) Importantly, the EIS states, "[t]reatment of bank erosion is not an element of the Landside Improvements Project but is a part of SAFCA's overall NLIP." (EIS at 1-7) These are overt admissions that the action analyzed in the EIS is only a segment of the whole action. While the

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flood protection improvements at Folsom Dam may not need explicit analysis in this EIS, the EIS must analyze at a project-specific level the integrally related construction activities on both sides of the same Natomas levees and also include actions that will be taken over the next three years as part of one federal action.

There is other evidence that the EIS analysis is improperly segmented. For instance, the modeling for the EIS included all bankside and landside improvements that SAFCA proposes. Appendix A explains that "[t]he With Project condition adds the improvements proposed as part of the NLIP to the Without Project condition." (EIS Appx. A at 5) Furthermore, just as the public review period for this EIS closes, the Corps and SAFCA are preparing yet another review document on similar actions to be carried out next year (see Exhibit 3). All of these activities should have been analyzed in one document as one action. Also, the EIS indicates that the Corps is consulting with both the Fish and Wildlife Service and National Marine Fisheries Service, which indicates that both bankside and landside effects are being considered. Did the Corps prepare numerous Biological Assessments for its ESA compliance for this activity or only one? If only one BA was prepared, then the Corps' preparation of numerous NEPA documents would seem inappropriate given the fact that both NEPA and the ESA define the scope of the agency action under review similarly.

Even though the Corps anticipates having to issue numerous permits over the next few years, the Corps must analyze the effects of all the future actions it will take regarding SAFCA's Natomas Levee Improvements and provide analysis of the direct and indirect effects of such actions. It is improper to analyze only the granting of a permit for one phase of the landside improvements. Neither the landside nor bankside activities proposed by SAFCA are independent because SAFCA cannot achieve its goal of flood protection for Natomas without fully implementing all of these actions. The same goes for SAFCA's alleged phases of implementation.

The fact is that SAFCA is embarking on one large project that has many components that will take several years to complete because of the sheer magnitude of SAFCA's endeavor. But in reality the action is nothing but a complicated construction project consisting of a connected series of levee fixes. There is no fundamental difference or distinction between any of the proposed actions justifying tiering or segmenting the NEPA analyses. Mere urgency is not a sufficient justification for the Corps to segment NEPA analysis.

The improper segmentation of the action precludes meaningful site-specific analysis of the whole action in this EIS. This flaw infects virtually all of the impact analysis sections

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because each section does not analyze the impacts of the whole action.[1] The Corps must perform a full, site-specific analysis disclosing specific details of all parts of the action for the next three years, and addressing their environmental effects.

III. The Corps Must Evaluate the Threat of Increased Erosion to the Sacramento River's West Levees

In its previous CEQA documents, SAFCA did not classify slight adverse changes in river hydraulics or to flows in the Yolo Bypass as significant impacts. RD 2035 commented that this was improper considering that the west side Sacramento River and Yolo Bypass levees are already under great stress in flood events, making any change to the hydraulics or river elevation significant. Indeed, the catastrophic consequences of a levee failure on any stretch of the Sacramento River leave no room for further increases in river elevation.

Regarding project impacts to river velocity and flow, SAFCA stated that "[s]ome slight increase in scour would result from the increased velocities that could result in surface erosion of exposed soils on the berm areas where vegetation was removed." (Bank Protection Project DEIR at 7-7). The EIS, however, does not evaluate the impacts of the scour from increased flows and determine whether this will increase maintenance costs on the Sacramento River west levees. Similarly, the EIS does not evaluate the total cubic volume of fill that SAFCA intends to add to the Sacramento River for all the Natomas levee improvements. The EIS must evaluate these issues and discuss possible mitigation for these effects.

IV. The Corps Must Evaluate the Threat of Underseepage and Overall Levee Stability

In its NEPA scoping letter, RD 2035 commented that none of SAFCA's modeling for its CEQA documents analyzed the threat of underseepage or levee instability, and that the Corps should provide such information in its EIS. Unfortunately, it appears that the Corps has not performed this evaluation, but instead relied on SAFCA's incomplete modeling. For the same reasons previously discussed in our NEPA scoping and CEQA comment letters, the Corps must provide details of the stability and underseepage risk of the Natomas levees versus those across the Sacramento River. Without such information, it is unproven that SAFCA's projects will not affect the flood risk to the opposite levees, and the EIS's conclusions regarding the effect on flood risk to Yolo County are unfounded.

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[1] When applicable, RD 2035's remaining comments are directed at the effects of the entire levee improvement project and not the artificial description provided in the EIS.

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V. The Corps Should Utilize Its Probabilistic Modeling Method, or Fully Discuss the Limitations of SAFCA's Model

In its scoping comments, RD 2035 urged the Corps to conduct its own, independent modeling and develop its own assumptions and modeling inputs. The EIS appears to underscore this comment in its candid disclosure that:

> SAFCA's approach to defining level of protection (system performance) differs from that of the USACE. References in this document to levels of protection are based on SAFCA's deterministic approach (the current FEMA method) and should not be taken as USACE concurrence that such levels will be achieved when the USACE probabilistic approach is utilized to define system performance. (EIS at 1-4)

This text discloses a difference between SAFCA and the Corps' flood risk modeling, but it does not provide full disclosure as to what this potential difference means to the NEPA analysis. Given this difference, it is unclear why the EIS adopts SAFCA's project objective of 100-year protection based on the SAFCA model, not the Corps model. The Corps should determine its own objective for the action, or alternatively convert the SAFCA objective into its modeling method. To accurately inform the public, the EIS needs to include these details.

Even if adopting SAFCA's modeling method were appropriate, the EIS must also explain how accurate and precise the UNET model used in this analysis is in detecting slight river and bypass elevation changes, or other metrics like river velocity and erosion or scouring potential. For instance, the EIS should explain the confidence interval surrounding the model's results and what statistical methods were employed to assess the model's results. Without such information, the EIS does not provide the public with a reasoned explanation of how it can rely on SAFCA's model to assess flood risks on either side of the Sacramento River before issuing permits for such actions.

VI. The Yolo Bypass Improvement Alternative Was Arbitrarily Rejected From Detailed Consideration

The EIS should not have eliminated the Yolo Bypass Improvement Alternative from consideration without detailed analysis. The EIS explains that this measure was eliminated because it would cost $700 million and because it would not correct freeboard deficiencies and underseepage and through-seepage conditions in Natomas levees. (EIS at ES-6) However, the EIS also reveals that improving the Yolo Bypass:

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Therefore, improvements to the Yolo Bypass would reduce flood risk to a large portion of the region and would also reduce the amount of work necessary on the Natomas levees, especially freeboard deficiencies. This increase in regional flood protection would provide a much better economic return, in terms of reducing flood damage risk. It would also save money by reducing construction and operation and maintenance costs, and also avoid unnecessary environmental impacts, and the use of additional resources such as borrow material. For these reasons, a Yolo Bypass Improvement and the reduced construction required on the Natomas levees should be evaluated in full. Further justifying this request is the EIS's admission that:

> On a long-term basis, however, regionally oriented improvements to the Yolo and Sacramento Bypass systems would help to address potential changes in hydrology due to climate change and would reduce the risk of uncontrolled flooding on a system-wide basis. . . . [R]educing [flooding] frequency by increasing the conveyance capacity of the SRFCP would avoid the cost of repairing and reconstructing damaged levees and other public infrastructure. . . ." (EIS Appx. A at 16)

To support its rejection of the alternative, the EIS states that "this measure would require an unprecedented degree of State, Federal, and local cooperation and funding, and therefore would not meet the project objective of providing 100-year flood protection to the Natomas Basin as quickly as possible." (EIS at 2-2) But this statement ignores the fact that there is already an unprecedented amount of State and Federal cooperation and that a system-wide solution such as the Yolo Bypass Improvement is already at the door through the State's FloodSAFE effort. Has the Corps adopted SAFCA's objective to rush to complete this project as quickly as possible? RD 2035 urges the Corps not to rush because regional, longer-lasting, and better solutions are imminently forthcoming.

Also, if the Corps has adopted SAFCA's "urgency" argument, then the EIS must fully explain the risk of flooding in Natomas next year or the year thereafter, and the EIS must quantify the difference in risk, if any, between this rushed project and the forthcoming comprehensive, system-wide flood fix. The fact is that State and Federal reservoirs are at extremely low levels and the risk of flooding in the next several years is low. Therefore, it is

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particularly inappropriate and illogical for the EIS to use the fear of imminent flooding to foreclose rational decision-making.[2] As the world's premiere environmental planning and policy enactment, NEPA is precisely the tool whereby the public and decision-makers should be apprised of the full array of options. The Corps' own regulations and internal policies also call for a more thorough and comprehensive approach than SAFCA appears to be pursuing.

The EIS also cites the cost of the Yolo Bypass Improvement as a factor making it infeasible, but the EIS does not provide any explanation or details. If cost is a limiting factor, then the EIS must explain how much money the Yolo Bypass Improvement could save by obviating the need for certain improvements to levees surrounding Natomas, in addition to including other economic variables. It must also disclose the full source of funding anticipated for the Natomas project to establish that those funds could not be redirected toward the Yolo Bypass Improvement. Please provide such details in the Final EIS. Without such disclosure, the EIS's naked conclusions are unsupported by evidence and therefore arbitrary.

VII. The Corps and SAFCA Should Integrate Their Activities With the FloodSAFE Strategic Plan

RD 2035 believes that current State bond funding and anticipated Federal appropriations for flood control, in addition to SAFCA's own bond funds, are more than sufficient to implement the Yolo Bypass Improvement and the reduced Natomas levee improvements that would still be required under that alternative. However, SAFCA's project threatens to divert State and Federal money from being used to implement a comprehensive solution to the flood threat facing the Sacramento Valley. The Corps and SAFCA should be integrating their activities with the State's current plan to develop a system-wide solution (i.e., FloodSAFE). This is especially so in light of the fact that the proposed action already seems predicated on cooperation from the State and Federal governments. For instance, the EIS explains that:

> SAFCA's early implementation project is running ahead of the GRR submittal date with the expectation that the perimeter levee improvements that are constructed in advance of any Congressional action on the GRR will be found to be consistent with the recommendations contained in the GRR. On that basis, SAFCA anticipates that the non-Federal costs incurred in the early implementation project could be credited against the remaining non-Federal share of the cost of the enlarged Common Features Projects. (EIS at 1-13)

[2] The desire for quick implementation is also no justification for segmenting the NEPA review.

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Thus, SAFCA is proceeding with the assumption of being reimbursed by the Federal government. However, "Federal participation in the project will require additional action by Congress based on the results of the GRR as discussed above." (EIS at 1-3) Therefore, the EIS should also assume that a comprehensive flood solution for the region is forthcoming.

The EIS claims that SAFCA's project and this action are entirely consistent with the State Plan of Flood Protection (EIS at 5-30-31), but this is not accurate. Historically, the Natomas Basin was a deep floodplain that stored flood flows, reducing river flows by some amount. Conservation of some of that historic flood storage may be essential to the State's overall flood plan. However, by investing in protecting the entire Natomas Basin and rejecting further analysis of the Natomas Cross Levee alternative, for example, the proposed action likely forecloses consideration of maintaining a portion of the Natomas Basin as a floodplain to help alleviate stress on the levee system during periods of peak flood flows.

For these reasons, RD 2035 believes that a comprehensive solution to the Sacramento Valley's flood problems is the best approach. Such a solution would provide the most benefit to the most people, make best use of public funds, and allow environmental and economic considerations to be fully and properly considered. However, through this EIS, the Corps is following SAFCA's lead in abandoning that comprehensive vision, and not abiding by NEPA's mandate to provide the public and decision-makers with full disclosure of the options available to protect Natomas from flooding and the environmental consequences of each.

VIII. If The Corps And SAFCA Increase The Flood Risk To Yolo County, Then They Must Mitigate The Increased Risk

The SRFCP is a comprehensive flood control system designed by the Federal and State governments. All the levees in the system are owned by the Federal or State government. If the Corps and SAFCA, with the cooperation of the State and Federal governments, choose to expend huge amounts of money on only a small portion of the system, then any risk transferred to other portions is the responsibility of the State and Federal governments. The Corps and SAFCA appear to be making a de facto policy choice to neglect and essentially flood the Yolo County side of the Sacramento River instead of improving both sides of the river in a coordinated fashion. If this is the new policy, then the EIS should expressly acknowledge it.

The EIS attempts to explain that "the SRFCP is not intended to provide a uniform level of flood protection . . . to various sub-basins within the protected area." (EIS Appx. A at 3) It also states that "each sub-basin's flood protection is dependent on the fitness of its own levees and not on the condition (or failure) of any other sub-basin's levees. Accordingly, each sub-basin has the right to keep its levees in the fittest possible condition." (EIS Appx. A at 3) These

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statements, even if true, are inappropriate NEPA thresholds of significance. Please describe where these general principles of the SRFCP are formulated or located. Also, please explain what level of flood protection the portion of Yolo County west of Natomas is entitled to under the SRFCP principles of operation.

RD 2035 believes that the SRFCP was designed to provide system-wide flood protection and to protect both sides of the Sacramento River near Natomas equally. Furthermore, flood risk is an environmental effect that the EIS must discuss, instead of discounting. While government can make a policy choice to increase the risk of flooding, or the depth of flooding, in a particular area, such decisions cannot be done without an evaluation of the environmental effects (here flood risk) and discussion of compensation or other mitigation. The EIS acknowledges this in its discussion of the Reduced Natomas Urban Levee Perimeter, where the alternative is rejected, in part, because it "would cause floodwaters north of the cross levee to be considerably deeper than they would be without the cross levee, and that either flowage easements would need to be acquired on all lands in the basin north of the cross levee or a weir and pumping facilities would need to be constructed to facilitate evacuation of floodwaters." (EIS at 2-2) This same principle applies here, thus the EIS must discuss ways to compensate or mitigate the impact of local, State, and Federal agencies deliberately choosing to fund a project that increases the flood risk on the Yolo County side of the Sacramento River instead of using the available funding and political resources to design a comprehensive, system-wide flood solution for both sides of the Sacramento River.

IX. Increasing Risk To Yolo County May Violate Environmental Justice Mandates

The EIS must comply with Executive Order 12898 and identify the disproportionate placement of adverse environmental and social consequences from Federal actions or policies on minority and low-income populations. The policy here of approving permits to improve the Natomas levees while increasing the flood risk to the opposite side will disproportionately affect agricultural regions and portions of Woodland, Yolo County, or Sutter County, which may implicate environmental justice issues. The EIS completely ignores this possibility and provides no analysis of any potential disparity between protecting Natomas and subjecting portions of Yolo County and Sutter County to increased flood risk. The Final EIS should include this consideration.

X. The EIS Must Provide More Detail Regarding the Operation And Maintenance of the Natomas Levees

The levees will require continual maintenance to provide all the benefits claimed in the EIS, but the EIS provides insufficient detail to understand how continued maintenance of the

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levees will be achieved in the future. A proper explanation of long-term maintenance is crucial to describing and analyzing the proposed action because without proper maintenance of the levees, additional environmental impacts may occur and the supposed flood risk reductions may not be realized. Thus, the responsibility for maintenance is a vital aspect of the description of the action and has direct bearing on the NEPA analysis, and any Federal cost-benefit analyses. The EIS states:

> SAFCA would be responsible for the design and construction of all levee improvements . . . [h]owever, once these project features are completed, most of the land or land management responsibility would be conferred by SAFCA to the other management entities described below. Memoranda of agreement, land ownership transfers, or management endowments and contracts would be used by SAFCA to transfer land management responsibility to the appropriate public agency or nonprofit land management organization. At the end of the project construction period, all project lands would be in public ownership and/or would be under the permanent control of a natural resource conservation entity. (EIS at 2-41)

Will SAFCA own the levees after completing the proposed action? Does the term "project lands" include the levees? By use of the term "confer," does this EIS passage indicate that SAFCA will transfer ownership of the Natomas levees to local entities? Will such transfers affect the State and Federal plans for a comprehensive flood control system? How will SAFCA or the Corps ensure that these local entities continue to maintain the Natomas levees? To justify its conclusions regarding flood protection and environmental effects, the EIS must provide these details.

XI. Other Issues

The EIS analysis is also lacking in several other respects described below:

Climate change – The EIS does not appear to adequately consider climate change effects on river hydrology. The EIS also fails to consider the contribution of greenhouse gases from the urban growth in Natomas that will be an indirect effect of the action, and which will not occur without approval of this action.

Growth Inducing Effects – The EIS states that essentially no growth will occur without the Corps granting a permit because the Natomas basin will be mapped as a FEMA floodplain, rendering new building economically unviable. However, the EIS does not include a sufficient analysis of all the direct and indirect effects of growth directly attributable to the Corps'

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proposed permitting action. Instead, the EIS tries to point to other state or local land use plans and laws, but these are not substitutes for NEPA analysis. The impacts of, and potential mitigation for, the reasonably foreseeable growth in Natomas that this action will essentially cause must be evaluated in more detail by the EIS. This urbanization will likely cause many changes that will have significant effects to a wide variety of resource categories. The impacts of these effects (i.e., development in the floodplain) on the giant garter snake must be considered in the EIS and in the Corp's ESA section 7 consultation on the action because the Natomas Basin HCP did not include a large area of the basin that will be open to development if the entire basin is protected, and because the HCP does not satisfy the Corp's Section 7 obligations.

Stormwater Runoff – The EIS should evaluate the cumulative anticipated increase in stormwater runoff caused by the urbanization of farmland in Natomas from the growth allowed by this Federal action.

XII. Conclusion

For the numerous reasons discussed above, the EIS must be significantly revised and should thereafter be recirculated for public review. RD 2035 remains interested in working with SAFCA and the Corps to resolve regional flood control issues and to develop comprehensive flood protection for the region. RD 2035 also supports flood protection for urbanized areas such as Natomas, but not without assurances that such actions will not affect the current and future flood risks to RD 2035. RD 2035 appreciates the opportunity to provide the Corps with comments, and will gladly work with SAFCA and the Corps to resolve the issues raised in these comments. If more clarification or other information is needed regarding these comments, please contact me at (916) 321-4500.

Sincerely,

KRONICK, MOSKOVITZ, TIEDEMANN & GIRARD
A Law Corporation

Hanspeter Walter

HW/dg
Enclosures

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EXHIBIT 1

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HANSPETER WALTER
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January 18, 2008

VIA E-MAIL (Email: Elizabeth.G.Holland@usace.army.mil)
and U.S. MAIL

Ms. Elizabeth Holland
Planning Division
U.S. Army Corps of Engineers, Sacramento District
1325 J Street
Sacramento, CA 95814

Re: Comments on SAFCA's Landside Improvements Project and Bank Protection Project Draft Environmental Impact Reports

Dear Ms. Holland:

A. Introduction

This letter provides scoping comments from Reclamation District 2035 ("RD 2035") regarding the Army Corps of Engineer's ("Corps") compliance with the National Environmental Policy Act ("NEPA") for the Natomas Levee Improvement Program, which is proposed by the Sacramento Area Flood Control Agency ("SAFCA"). SAFCA's Program consists of numerous proposed projects over the next several years to improve flood control and protection in the Sacramento County area of Natomas. To comply with the California Environmental Quality Act ("CEQA"), SAFCA prepared environmental documentation for its Bank Protection Project, SCH# 2007062017, ("Bank Project") and the related Landside Improvements Project, SCH# 2007062016, ("Landside Project"). RD 2035 provided a detailed comment letter on those projects during their CEQA review process. This letter raises many of the same issues to alert the Corps to some of the key environmental analyses and issues that should be included in its Environmental Impact Statement ("EIS") that will analyze the Corps federal action of granting permits allowing SAFCA to implement its Program.

B. Reclamation District 2035

Reclamation District 2035 ("RD 2035") was formed in 1919 to provide levee maintenance and drainage services to approximately 20,500 acres of land in Yolo County near the City of Woodland.

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RD 2035 is a local public entity that has legal authority and jurisdiction under Water Code Section 50000 et. seq to implement flood control programs and projects that reconstruct, replace, improve, or add to facilities as defined in Public Resources Code Section 5096.805(j). RD 2035's service area includes the Conaway Ranch property. The Conaway Ranch property covers over 17,000 acres on the west side of the Sacramento River between the cities of Davis and Woodland. Approximately 40 percent of the Ranch is located within the Yolo Bypass and the remainder lies west of the bypass. Both RD 2035 and the Conaway Preservation Group, LLC, which manages the Conaway Ranch, are actively involved in encouraging and seeking solutions to the region's flood problems while conserving open space, agriculture, and rural and environmental values.

C. SAFCA is Protecting Natomas at the Risk of Flooding Other Areas

The Corps should recognize that SAFCA is attempting to proceed with levee improvements to only one side of the Sacramento River. While such an approach may be politically acceptable for SAFCA because it only has responsibility for one side of the river, the Corps has regionwide responsibilities. Therefore, the Corps should acknowledge this short-sighted policy and analyze whether it creates an increased risk of flooding to lands on the opposite side of the Sacramento River and Natomas Cross Canal. In particular, the EIS should discuss mitigation measures that will safeguard the Yolo County side of the Sacramento River from catastrophic flooding. Given NEPA's focus on the human environment, the Corps should consider ways to prevent human encroachment of flood plains on lands on the opposite side of the river from Natomas. Such efforts will provide a long-term mechanism to keep people out of harm's way.

D. The Corps Must Analyze the Flood Threat to the Opposite Side of the River

In its CEQA documents, SAFCA did not classify slight adverse changes in river hydraulics or to flows in the Yolo Bypass as significant impacts. RD 2035 commented that this was improper considering that the west side Sacramento River and Yolo Bypass levees are already under great stress in flood events, making any change to the hydraulics or river elevation significant. Indeed, the catastrophic consequences of a levee failure on any stretch of the Sacramento River leave no room for further increases in river elevation. Thus, the Corps should consider any increase in river elevation during floods as a significant change to the human environment, and the EIS should discuss mitigation measures that could reduce these changes.

Regarding project impacts to river velocity and flow, SAFCA stated that "[s]ome slight increase in scour would result from the increased velocities that could result in surface erosion of exposed soils on the berm areas where vegetation was removed." (Bank Protection Project DEIR pg. 7-7). The Corps should closely evaluate the impacts of the scour from increased flows and determine whether this will increase maintenance costs on the Sacramento River west levees. Similarly, the Corps should evaluate the total cubic volume of fill that SAFCA intends to add to the Sacramento River next year and for all the remaining Natomas levee improvements in subsequent years.

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E. The Corps Should Perform Detailed, Independent Modeling

Although, SAFCA conducted modeling, many details were not revealed or discussed during the CEQA process. RD 2035 urges the Corps to conduct its own, independent modeling and develop its own assumptions and modeling inputs. In its NEPA documents, the Corps should make sure it provides specific information regarding its modeling methods. If model runs show weak areas in any levees on either side of the Sacramento River, please provide specific evidence of the exact location of those levee failures and/or overtopping for all model runs or scenarios. Please also explain the reason why the model indicates these levees failed.

If the Corps adopts SAFCA's modeling method, it should explain how accurate and precise the UNET model used in this analysis is in detecting slight river and bypass elevation changes, or other metrics like river velocity and erosion or scouring potential. For instance, the Corps should explain the confidence interval surrounding the model's results and what statistical methods were employed to assess the model's results? Without such information, the Corps will not provide the public with a reasoned explanation of how it can rely on an abstract model to assess flood risks on either side of the Sacramento River before issuing permits for such actions.

F. The Corps Must Evaluate the Threat of Underseepage and Overall Levee Stability

None of SAFCA's modeling for its CEQA documents analyzed the threat of underseepage or levee instability. The Corps should provide details of the stability and underseepage risk of the Natomas levees versus those across the Sacramento River. Without such information, it is unproven that SAFCA's projects will not affect the flood risk to the opposite levees. Additionally, SAFCA's current modeling appeared to indicate that the Natomas levees are already high enough to withstand the 100-year and 200-year flood threat because there is no overtopping. The urgency with which SAFCA is proceeding, however, suggests that the true concern may be levee underseepage and stability.

As the Corps recently determined, the Natomas levees do not provide the required flood protection that SAFCA has claimed, and FEMA will soon map the area as a deep floodplain (see Sacramento Business Journal Article 1/15/2008 - "*Building Moratorium Likely Following Flood Report*"). This recent information calls into question any reliance on SAFCA's modeling or its CEQA conclusions that improvements to the east Sacramento River levees will not increase the flood risk to the west side of the Sacramento River because the east side levees are already much stronger and would not overtop or fail under current conditions. RD 2035 requests the Corps to provide a detailed analysis and discussion of this issue.

G. The Corps Should Not Rush To Provide 100-year Flood Protection "As Quickly As Possible" Because It Unnecessarily Forecloses the Development of Better Alternatives

SAFCA has persistently stated that time is of the essence, but the Corps should not insert a time factor into its objectives for its federal action(s) because SAFCA's own modeling in all three CEQA

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documents prepared for the Program did not indicate that the Natomas Basin levees would be overtopped or fail – even at the 200-year flood level. If this is true, the area already has 100-year flood protection by SAFCA's estimation. Without this urgent need, the Corps has more time to develop and discuss alternatives that will provide a comprehensive solution, as discussed in Section H.

H. The Corps Must Analyze Project Alternatives, Including A More Integrated and Comprehensive Regional Flood Solution

Even with the proposed levee improvements, the threat of flooding in the Natomas Basin will remain, and the residents of the Sacramento region and the State of California will have to continue to periodically invest huge sums of money to support the levees and maintain SAFCA's project. The fact is that the Sacramento River levees are too narrow in many places, which creates excessive erosion that requires constant monitoring and maintenance. Over time, this constant activity will further degrade the environmental, aesthetic, and recreational values of the Sacramento River. NEPA requires the Corps to consider longer lasting solutions to the local and regional flood situation and the long-term impacts of its actions. RD 2035 urges the Corps to provide a detailed discussion and analysis of long-term alternatives to raising only the Natomas levees.

Such alternatives could include setting back existing levees, redesigning the Yolo Bypass, purchasing or creating additional flood storage in reservoirs, developing additional designated flood plains or temporary, emergency flood storage locations, or other solutions. Citing institutional hurdles is not a sufficient excuse that justifies avoiding these issues because there is currently a great deal of political momentum behind a comprehensive solution to flood issues. The recent passage, among other things, of SB 5, SB 17, AB 70, AB 162, and AB 156 are new events substantially changing the circumstances under which SAFCA is proposing its projects. These changed circumstances provide added incentive to pursue a broader solution. For instance, the Legislature has directed the Department of Water Resources to provide system-wide evaluations and recommended flood control measures in a few years. SAFCA should cooperate with DWR in this effort instead of going forward with its project. The Corp's EIS should discuss these issues and the potential for the SAFCA's current approach to foreclose better, long-term solutions that would allow the Sacramento River to remain a valuable environmental, aesthetic, and recreational resource and will require less frequent infusions of costly construction activities.

I. The Corps Should Avoid Piecemeal Environmental Review

SAFCA divided its environmental review process into numerous CEQA documents and processes. This approach confused the public and failed to disclose the true environmental effects of the overall program. While the Corps may anticipate having to issue numerous permits over the next few years, the Corps should not follow the same path to comply with NEPA. Instead, the Corps should analyze the effects of all the future actions it will take regarding the SAFCA Program and provide analysis of the direct and indirect effects of such actions. In order to adequately perform such analyses, the Corps requires detailed program and project-level descriptions from SAFCA of

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what it intends to do once it receives the Corp's permit(s) so that the Corps can evaluate the effects of granting federal permits to SAFCA for such actions.

J. The Corps Should Accurately Describe the No Action Alternative

SAFCA's environmental documents provided inconsistent no-project alternatives. The Corps should carefully consider this issue, and then provide a good faith discussion of the potential flood risk to all areas and economic impacts on the region if the federal action is not approved. An accurate and detailed no-action alternative is crucial to the NEPA process.

Conclusion

RD 2035 remains interested in working with SAFCA and the Corps to resolve regional flood control issues and to develop comprehensive flood protection for the region. RD 2035 also supports flood protection for urbanized areas such as Natomas, but not without assurances that such actions will not affect the current and future flood risks to RD 2035. RD 2035 appreciates the opportunity to provide the Corps with scoping comments, and will gladly work with SAFCA and the Corps to resolve the issues raised in these comments. We look forward to reviewing the Corp's EIS when it becomes available. If more clarification or other information is needed regarding these comments, please contact me at (916) 321-4500.

Very truly yours,

KRONICK, MOSKOVITZ, TIEDEMANN & GIRARD

Hanspeter Walter
Counsel for Reclamation District 2035

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EXHIBIT 2

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SCOTT A. MORRIS

October 29, 2007

VIA E-MAIL (Email: BassettJ@SacCOunty.net)
and U.S. MAIL

Mr. John Bassett
Sacramento Area Flood Control Agency
1007 7th Street, 7th Floor
Sacramento, CA 95814

Re: Comments on SAFCA's Landside Improvements Project and Bank Protection Project Draft Environmental Impact Reports

Dear Mr. Bassett:

A. Introduction

This letter provides Reclamation District 2035's ("RD 2035") joint comments on both Draft Environmental Impact Reports for the Natomas Levee Improvement Program Bank Protection Project, SCH# 2007062017, ("Bank Project") and the related Natomas Levee Improvement Program Landside Improvements Project, SCH# 2007062016, ("Landside Project"). RD 2035 is providing a single response letter in light of the Sacramento Area Flood Control Agency's ("SAFCA's") decision to simultaneously release both DEIRs (i.e., the "Landside DEIR" and the "Bank DEIR") for public review. Both DEIRs involve different parts of the same project, which is part of one overarching program that was evaluated in SAFCA's Local Funding Mechanisms Program DEIR ("Programmatic DEIR"). RD 2035 intends that all the comments in this joint comment letter be submitted separately to each DEIR and responded to separately by SAFCA in both the Landside and Bank FEIRs.

B. Reclamation District 2035

Reclamation District 2035 ("RD 2035") was formed in 1919 to provide levee maintenance and drainage services to approximately 20,500 acres of land in Yolo County near the City of Woodland. RD 2035 is a local public entity that has legal authority and jurisdiction under Water Code Section 50000 et. seq to implement flood control programs and projects that reconstruct, replace, improve, or add to facilities as defined in Public Resources Code Section 5096.805(j). RD 2035's service

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area includes the Conaway Ranch property. The Conaway Ranch property covers over 17,000 acres on the west side of the Sacramento River between the cities of Davis and Woodland. Approximately 40 percent of the Ranch is located within the Yolo Bypass and the remainder lies west of the bypass. Both RD 2035 and the Conaway Preservation Group, LLC, which manages the Conaway Ranch, are actively involved in encouraging and seeking solutions to the region's flood problems while conserving open space, agriculture, and rural and environmental values.

C. SAFCA is Protecting Natomas at the Risk of Flooding Other Areas

SAFCA is attempting to proceed with levee improvements to only one side of the Sacramento River. While this approach may be more convenient for SAFCA, it represents a myopic focus on local benefits that is contrary to sound public policy and flood project planning for the entire region. SAFCA should acknowledge this short-sighted policy and admit that it creates an increased risk of flooding to lands on the opposite side of the Sacramento River and Natomas Cross Canal. Is it SAFCA's policy to increase flood risks to less urbanized or extra-jurisdictional areas in order to protect lands within its jurisdiction, like Natomas? What is SAFCA's view of its responsibility for the effects of its flood control activities on flood risk in other areas?

D. SAFCA is Using Improper Significance Thresholds to Analyze the Flood Threat to the Opposite Side of the River

The DEIRs significance criteria and conclusions based on them are improper. Given that the west side Sacramento River levees are already under great stress in flood events, any change to the hydraulics or river elevation should be considered significant. The catastrophic consequences of a levee failure on any stretch of the Sacramento River leave no room for further increases in river elevation. Thus, any increase in river elevation during floods is significant and should be the proper threshold used in the analysis, not 0.1 foot. What is the basis supporting the 0.1 foot threshold?

Regarding impacts to water surface elevations and freeboard, SAFCA's approach to using a different threshold of significance for levees within the SRFCP and those outside the SRFCP's protection is irrational. The threshold for impacts to flood risk should be the same for all levees. The choice of the "1957" design profile as the threshold for significant encroachment is not justifiable. The known flood threats using information after the 1986 and 1997 storm events, render the 1957 design profile outdated for use as a significance threshold.

If the 1957 design standard is an accurate threshold for significance, then SAFCA should be trying to achieve that standard along the Natomas levees – instead, SAFCA is pursuing a higher, more realistic standard for itself and judging its impacts on others using the outmoded standard. As SAFCA has stated,[1] the levees on the west side are already apparently below the freeboard

[1] At the public hearing before the SAFCA Board, Executive Director Stein Buer repeatedly maintained that the status quo (i.e., baseline) was that levees on the opposite side were already significantly shorter and weaker.

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standards that SAFCA is seeking for the east side levees. Thus, the west side levees already have a significant problem with freeboard encroachment using modern standards, not the outmoded 1957 design standard. Any further rise in water elevation makes this existing problem that much harder to solve and is a de facto significant impact, which SAFCA must recognize and mitigate. As SAFCA itself stated:

> These improvements could reduce the risk of overtopping and failure of these levees, thereby causing more water to be retained in the channels under rare flood conditions. This, in turn, could increase the potential for overtopping and failure elsewhere in the SRFCP system, either within the Sacramento metropolitan area or upstream or downstream of this area. (Landside DEIR at 3.4-6).

Regarding project impacts to river velocity and flow, the Bank DEIR states that "[s]ome slight increase in scour would result from the increased velocities that could result in surface erosion of exposed soils on the berm areas where vegetation was removed." (Bank DEIR pg. 7-7). But the Bank DEIR does not discuss the increase in elevation or water velocity caused by adding fill to the waterside banks of the levees as depicted in its Figures 5-1 and 5-2. Table 4-1 indicates that proposed bank protections from only next year's construction will involve almost 9,000 linear feet with an average width of 65 feet. (Bank DEIR pg. 4-3). What is the total cubic volume of fill that SAFCA intends to add to the Sacramento River next year and for all the remaining Natomas levee improvements? How did SAFCA quantitatively calculate the effects of all this additional fill within the levees?

Without quantitative analyses of the effects on the river (e.g., velocity, height, etc. ...) of the fill, there is no justification for concluding the effects are less than significant. In light of the previously discussed stress that west side levees are already under during flood events, and the deficiencies of those levees assumed under SAFCA's baseline, any increase in scouring, erosion, or water elevation to the west side levees must be considered significant and must be mitigated.

E. SAFCA's Flood Modeling Should Include More Details

Several issues with regard to modeling require comment. First, it appears the baseline model run indicated that the Natomas levees would not overtop or fail at their current heights. In fact, this result is what SAFCA uses to justify its conclusion that there will be no impacts to the opposite side of the river, namely that the Natomas levees are stronger and higher already. But, as explained above, this baseline result weakens any need to implement the projects quickly. The model indicates that current infrastructure in Natomas is safe from the 100-year flood. Therefore, there is

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no reason to rush to invest hundreds of millions of dollars in the current flood control system when it is admittedly outdated and designed to solve problems that no longer occur (i.e., siltation).[2]

SAFCA should clarify that the main impetus for quick implementation of these projects is to avoid the FEMA remapping process that would occur. If alternatively, there is a real, physical 100-year flood threat to Natomas that must be repaired, then SAFCA's chosen modeling assumptions or methods are improper and inaccurate because the model does not accurately reflect that situation.

Please provide more specific information regarding the modeling methods. Please provide specific evidence of the exact location of Sacramento River levee failures (both west and east side) and/or overtopping for all model runs or scenarios for all three DEIRs. Please also explain the reason why the model indicates these levees failed. Please explain if the model indicates any east side Sacramento River levees would fail under any modeled scenarios and why they failed. If none failed, why not?

In regards to Section D's discussion of significance criteria, please explain how accurate and precise the UNET model used in this analysis is in detecting slight river elevation changes, or other metrics like river velocity and erosion or scouring potential. What is the confidence interval surrounding the model's results? What statistical methods were employed to assess the model's results? Were multiple model runs performed and the average taken? If so, what are the standard deviations around the averages? If no such information is available, then how can SAFCA rely on an abstract model to claim that the flood risk on the other side of the river will not be increased?

F. SAFCA Must Evaluate the Threat of Underseepage and Overall Levee Stability

The modeling in the DEIRs does not appear to analyze the threat of underseepage or levee instability. Did SAFCA analyze these threats in the UNET modeling or through other quantitative analyses of the flood risk its improvements would have to levees on the opposite side? If not, then SAFCA cannot assert that its projects will not affect the flood risk to the opposite levees.

The current modeling appears to indicate that the Natomas levees are already high enough to withstand the 100-year and 200-year flood threat because there is no overtopping. The urgency with which SAFCA is proceeding, however, suggests that the true concern may be levee underseepage and stability. If the UNET model did not model these factors, then it cannot be used to conclude that the baseline conditions of the Natomas levees are superior to the levees on the opposite side. What other information do the DEIRs contain to inform the public and decision makers of the superiority of the Natomas levees with regards to underseepage and stability. Without such information, SAFCA cannot support its baseline premise that the Natomas levees are

[2] At the public hearing on these EIRs, Executive Director Stein Buer explained that erosion of the Sacramento River bed, and not siltation, is the current condition.

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already stronger than the opposite side's and that the opposite side levees will fail first with or without the propsoed project(s).

The Natomas Levee Evaluation Report (prepared in 2006 for SAFCA by MBK Engineers and others) contains information about the composition and stability of the east side levees based on borings, but no comparable west-side levee data is provided. Please provide details of the stability and underseepage risk of the Natomas levees versus those across the Sacramento River to support the baseline premise that the current state of the Natomas levees has already shifted all of the flood risk to the other side. Were any borings or modeling of the sort done for the east side levees performed for the west-side levees? If so, please provide the information to prove that the stability and underseepage risk on the west-side levees is already materially greater than the east-side levees. We believe that this data is available from the Reclamation Board or the Army Corps of Engineers.

This issue is critically needed to assess the true increased flood risk that SAFCA's project creates for the opposite side. For instance, assume that levees on both sides of the river have an equal chance of failure and that one levee break must occur somewhere in that stretch of river during a 100-year flood to release pressure. Under this baseline each side effectively has a 50% chance of being flooded. If, however, one side then removes the chance of levee failure on its side, the other side is guaranteed to flood. The 50% risk of flooding on that side has been increased to 100% by the other side's actions. This oversimplified example shows the effects on flood risk that SAFCA's projects may have. SAFCA has presented no substantial evidence to support its premise that the east-side levees will not fail before the west-side levees as a result of underseepage and levee instability. Please provide such information or discuss the added flood risk to the opposite side of the river.

In sum, RD 2035 believes that SAFCA's baseline premise that Natomas area levees are already stronger than levees on the opposite side is unsupported in the DEIRs. Therefore, SAFCA's improvements may demonstrably increase the potential for a catastrophic levee break on the opposite side of the river, which may affect RD 2035 lands. This would be a significant impact under CEQA, for which SAFCA must provide mitigation.

G. SAFCA's Objective to Provide 100-year Flood Protection "As Quickly As Possible" Unnecessarily Forecloses the Development of Better Alternatives

The insertion of a time factor into the program and project objectives is not needed because SAFCA's own modeling in all three DEIRs did not indicate that the Natomas Basin levees would be overtopped or fail – even at the 200-year flood level. If this is true, the area already has 100-year flood protection by SAFCA's estimation and there should be no rush to spend large sums of money on a physical solution without an apparent physical problem. What does SAFCA mean by the 100-year flood protection it seeks to achieve as soon as possible?

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If SAFCA's real objective is to achieve FEMA 100-year certification as quickly as possible, then SAFCA must explain why FEMA 100-year certification is so critical given that its own modeling shows that the levees are currently strong enough to physically protect the Natomas Basin from a 100-year flood. Furthermore, the objective should be changed to more accurately state this. In this context FEMA 100-year protection appears to be merely an administrative determination that is separate from the physical threat evaluated and disclosed by the modeling. Which is the proper standard? Is it the FEMA determination or SAFCA's modeling?

The above issues present a logical disconnect in the DEIRs' explanation of why the project(s) is/are needed and what hydraulic effects they will have. As discussed in Section F, it appears SAFCA maintains that under baseline conditions its levees are already stronger than levees across the Sacramento River so that those levees would fail before the Natomas levees, thus reducing pressure on the Natomas levees even without the projects. But if this is the case, then the urgent need for these projects is obviated. SAFCA's own modeling, therefore, fails to disclose the urgent need for increased flood protection. Without this urgent need, SAFCA has more time to develop and discuss alternatives that will provide a comprehensive solution, as discussed in Section H. If this is not so, then SAFCA must explain the disconnect. RD 2035 suspects this is because, as discussed in Section F, levee stability and underseepage were not included in the modeling or any other quantitative analyses – a true failure of the DEIRs.

H. SAFCA Should Pursue A More Integrated and Comprehensive Flood Solution

Even with the proposed levee improvements, the threat of flooding in the Natomas Basin will remain, and the residents of the Sacramento region and the State of California will have to continue to periodically invest huge sums of money to support the levees and maintain SAFCA's project. The Programmatic DEIR explained that the current flood control system "although well suited to address the technical and financial challenges of a previous era, has left a succeeding generation of flood managers with two systemic problems and levee risk factors: chronic erosion and seepage." (Programmatic DEIR at 4.4-6). It also indicates that because "many segments of the mainstream levee system were constructed using relatively porous hydraulic mining sediments borrowed from the river channel, the levees have a propensity to seep when subjected to prolonged high water surface elevations." (*Id.*). The Bank DEIR concludes that:

> Over the long term, it is likely that additional bank protection will be needed in the region because the design of the SRFCP is expected to continue to induce erosion of unprotected banks and result in the loss of riparian vegetation. (Bank DEIR at 2-7).

The fact is that the Sacramento River levees are too narrow in many places. As explained in the quote above, the current configuration creates excessive erosion that requires constant monitoring and maintenance. Over time, this constant activity will further degrade the environmental, aesthetic, and recreational values of the Sacramento River. The DEIRs do not adequately discuss,

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analyze, or seek to avoid this problem. Quite the opposite, the Programmatic DEIR simply states that "by the mid-1950's it was agreed that bank protection would be a permanent capital cost of operating the SRFCP." (*Id.*). However, in the 1950's agencies did not have to comply with CEQA or consider alternatives. In 2007, CEQA requires that SAFCA consider longer lasting solutions to the flood situation and long-term impacts of its actions. The scanty selection of alternatives provided are not sufficiently innovative and are discounted too quickly without a real analysis of their comparative merits when compared to the long term environmental effects the chosen course of action commits to.

Instead of rushing to grab the low hanging fruit of continued fortification of the existing levee system to avoid being mapped a floodplain by FEMA for a few years, SAFCA should foster discussions and consideration of more comprehensive, overarching solutions to regional flood problems. RD 2035 stands ready to assist in this effort. While a comprehensive solution might take a few more years to develop, it would provide permanent and more effective flood control for the Natomas Basin and the region that would not need continued input of expensive construction and maintenance, which would also continually cause environmental impacts that CEQA requires a discussion of. Such a solution would provide a more dynamic, living river system that would provide lasting and greater environmental, recreational, and aesthetic benefits. CEQA requires that the public and decision-makers be presented with sufficient information about long-term environmental effects and potential alternatives before committing themselves to a long-term path that may foreclose other more viable paths.

Whether a comprehensive solution would include setting back existing levees, redesigning the Yolo Bypass, purchasing or creating additional flood storage in reservoirs, developing additional designated flood plains or temporary flood storage locations, or other solutions is up to SAFCA. Citing institutional hurdles is not a sufficient excuse that justifies avoiding these issues because there is currently a great deal of political momentum behind a comprehensive solution to flood issues. The recent passage, among other things, of SB 5, SB 17, AB 70, AB 162, and AB 156 are new events substantially changing the circumstances under which SAFCA is proposing its projects. These changed circumstances provide added incentive to pursue a broader solution and render any reliance on the Programmatic DEIR's alternatives discussion obsolete and inadequate under CEQA Guidelines section 15162. For instance, the Legislature has directed the Department of Water Resources to provide system-wide evaluations and recommended flood control measures in a few years. SAFCA should cooperate with DWR in this effort instead of going forward with its project. The DEIRs should be revised to discuss these issues and the potential for the current approach to foreclose better, long-term solutions that would allow the Sacramento River to remain a valuable environmental, aesthetic, and recreational resource and will require less frequent infusions of costly construction activities.

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I. SAFCA's Piecemeal Approach to the DEIRs Is Improper, Inconsistent, and Confusing

The division of the environmental review process into numerous DEIRs, both now and apparently in the future, is confusing and fails to disclose the true environmental effects of the overall program. The Landside and Bank projects, and all future SAFCA actions on the Natomas levees, are all parts of the same project because they are all collectively required to satisfy the project objectives and prevent FEMA from mapping the Natomas basin as a major flood zone. Improving only half the length of the east Sacramento River levees will not achieve the project objectives and would not be an action with independent utility unrelated to the other contemplated actions. CEQA requires an impact analysis of the "whole of the project," not chopping the project into smaller segments, each with a minor effect on the environment, but this is what SAFCA is doing.

By separating the Landside and Bank projects from one another and preparing two separate DEIRs, SAFCA has created a confusing muddle of documentation that is hard to follow and sometimes inconsistent. More importantly, by dividing the program into so many parts, each DEIR is able to address a smaller impact than the true impacts of the project. For instance, the impact to biological resources of the Landside project is distinct from that in the Bank project, but they should be considered together. The same is true of impacts to agricultural land that will be used to obtain the fill and raw materials for the levee fixes. Similarly, the impacts of future phases of both projects are not adequately discussed here. Why were the Bank DEIR and Landside DEIR not part of the same DEIR?[3]

SAFCA should develop a detailed description of all the levee improvements it intends to make, and which are required to achieve the project objectives of attaining (or maintaining) 100-year FEMA certification. Then, one EIR should evaluate the specific impacts to various resources that will occur as a result of the whole of those actions, which represents the single project's true environmental impact. Responding to this comment by pointing to the cumulative effects analysis in both DEIRs is not adequate because that analysis is intended to more generally analyze the effects of other reasonably foreseeable projects, not other parts of the same project. Citing the Programmatic DEIR is also inadequate because it did not provide sufficient detail of the various project components to adequately assess project-level impacts. That modeling also included revised Folsom Dam operations that are not yet possible because, to our knowledge, the revised spillway has not been completed.

While evaluations in the Programmatic DEIR may be appropriate for analyzing various parts of a program, there is a limit to how finely a lead agency may segment a program. Here, SAFCA has gone too far because it is not separately analyzing two different projects under the same program,

[3] The simultaneous release and circulation of both DEIRs indicates that both could have been combined into a single document, which would be easier for the public and the decision makers to review and would provide a better picture of the true impacts of the levee improvements SAFCA proposes.

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but rather two parts of the same project, and SAFCA has plans to do more of the same.[4] As stated, this shrouds the true impacts of the project, presents a confusing assembly of CEQA documents, and prevents a real evaluation of the merits of the proposed project versus alternatives.

J. SAFCA's No-Project Alternatives are Inconsistent

Both the Landside and Bank DEIR correctly state that an EIR "must evaluate a 'no-project' alternative, which represents 'what would be reasonably expected to occur in the foreseeable future if the project were not approved, based on current plans and consistent with available infrastructure and community services.'" (Landside DEIR at 11-1, Bank DEIR 6-1). Oddly, however, the EIRs present different pictures of what would reasonably occur in the no-project alternative. Because both projects are related parts of the overall program, and SAFCA maintains each is required to provide adequate flood protection to Natomas, the no-project alternative in each should be the same. In contrast, the current no-project alternatives appear to present artificial assumptions instead of explaining the reasonably foreseeable actions that would occur in the absence of the contemplated projects.

Alternative 1 of the Bank DEIR indicates that "[w]hile future federal/state action is the most likely scenario if SAFCA did not implement bank protection, the No-Project Alternative is defined as no bank protection being implemented at the nine sites." (Bank DEIR at 11-5). Thus, it appears that instead of presenting the reasonably foreseeable consequences of not implementing the project (i.e., Federal/State action) SAFCA created an improper and artificial no-project alternative precluding these likely actions and mimicking the project baseline.

Confusingly, in Alternative 4 of the Landside DEIR, SAFCA presents a different no-project alternative than it presented in the Bank DEIR. The Landside DEIR no-project alternative does not even mention the possibility of other Federal/State actions. The Landside DEIR also presents different future actions and consequences than the Bank DEIR's no-project alternative. The Landside DEIR states:

> Federal Floodplain regulations would prevent the Natomas Basin from absorbing new development as currently anticipated in the regional blueprint for future (2030) growth adopted by the Sacramento Area Council of Governments [cite]. As a result, up to 60,000 dwelling units and associated commercial and industrial developments may be redirected to other areas in the region over the next 2 decades. (Landside DEIR at 6-14).

[4] At the October 19, 2007 public hearing on this issue, SAFCA's general counsel indicated that supplemental or subsequent EIRs would be prepared for levee improvements for the next 6 miles of levee improvements slated for 2009, and then a similar process would again be followed for improvements intended in 2010. Such year-to-year CEQA review of the same project is improper.

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The Programmatic DEIR presented a similar no-project discussion. (Programmatic DEIR at 7-4). The three no-project alternatives should all be the same. They should provide the public and decision-makers with SAFCA's best analyses of what will occur in the absence of the projects and the overall program because they are all one inter-related part of the whole.

K. SAFCA Requires Reclamation Board Approval

Lastly, SAFCA's projects will require approval by the Reclamation Board. It appears that under Water Code section 8710, SAFCA will require approval from the Reclamation Board before construction is commenced. Furthermore, under Water Code section 8722, the Reclamation Board may change the plans or specifications for work undertaken at any time upon its own initiative. How will this process fit with SAFCA's intended schedule of rapid implementation?

Conclusion

In sum, RD 2035 remains interested in working with SAFCA to resolve regional flood control issues and to develop comprehensive flood protection for the region. RD 2035 also supports flood protection for urbanized areas such as Natomas, but not without assurances that such actions will not affect the current and future flood risks to RD 2035, or some other measures or mitigation to offset this increased risk. The DEIRs do not presently provide sufficient information for RD 2035 to determine the effects of SAFCA's proposed project(s) on the flood risks to the opposite side of the Sacramento River or Natomas Cross Canal. SAFCA's analyses and approach in the DEIRs also create other inconsistencies that make the analyses incomplete or difficult to understand.

RD 2035 appreciates the opportunity to comment on the DEIRs, and will gladly work with SAFCA to resolve the issues raised in these comments. If more clarification or other information is needed regarding these comments, please contact me at (916) 321-4500.

As a public agency, RD 2035 looks forward to receiving your official responses at least 10 days prior to certification of the EIRs.

Very truly yours,

KRONICK, MOSKOVITZ, TIEDEMANN & GIRARD

Scott A. Morris

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EXHIBIT 3

SAFCA
Sacramento
Area Flood
Control
Agency

NOTICE OF PREPARATION

To: Agencies and Interested Parties

From: Sacramento Area Flood Control Agency

Date: July 18, 2008

Subject: **Announcement of:**

1) **Notice of Preparation of a Draft Environmental Impact Statement/Environmental Impact Report on the Natomas Levee Improvement Program, Phase 3 Landside Improvements Project;**
2) **Public Scoping Meeting to be held on August 6, 2008; and**
3) **Scoping comments due by August 18, 2008**

The U.S. Army Corps of Engineers (USACE), Sacramento District, and the Sacramento Area Flood Control Agency (SAFCA) will be the federal and state lead agencies, respectively, and will prepare an environmental impact statement/environmental impact report (EIS/EIR) pursuant to the National Environmental Policy Act (NEPA) and the California Environmental Quality Act (CEQA) for the subject project in the Natomas Basin in Sacramento and Sutter Counties, California. USACE and SAFCA are soliciting input from interested agencies and the public as to the scope and content of the EIS/EIR.

INTRODUCTION

The California Environmental Quality Act (CEQA) specifies that a public agency must prepare an EIR on any project that it proposes to carry out or approve that may have a significant direct or indirect effect (also referred to as "significant impact") on the environment (Public Resources Code Section 21080[d]). SAFCA is proposing the Natomas Levee Improvement Program (NLIP), Phase 3 Landside Improvements Project (Phase 3 Project), as described below, and has determined that the proposed project may have significant impacts on the environment. Therefore, acting as the lead agency for CEQA compliance, SAFCA will prepare an EIR that evaluates these significant environmental impacts.

To implement the proposed project, SAFCA requires a permit from USACE pursuant to Section 404 of the Clean Water Act for the discharge of fill into jurisdictional waters of the United States, and permission pursuant to Section 408 of the Rivers and Harbors Act for alteration of a federal project levee. A joint EIS/EIR will be prepared to evaluate the significant environmental impacts of the proposed project, including those impacts associated with USACE's decision making processes for Sections 404 and 408.

PURPOSE OF THE NOTICE OF PREPARATION

The purposes of this notice are to:

1. briefly describe the proposed project and the anticipated content of the draft EIS/EIR to be prepared for the proposed project;

2. announce the public scoping meeting to facilitate public input and to be held: Wednesday, August 6, 2008, from 4:00 to 7:00 p.m. at 1321 Garden Highway (Sierra Health Foundation) in Sacramento, California; and

3. solicit input by August 18, 2008, from interested federal and state agencies, and from interested organizations and individuals about the content and scope of the draft EIS/EIR, including the alternatives to be addressed and the potentially significant environmental impacts.

PROJECT BACKGROUND

The Landside Improvements Project is part of SAFCA's efforts to reduce flood risk for the Sacramento area, and is part of the NLIP evaluated in SAFCA's programmatic *EIR on Local Funding Mechanisms for Comprehensive Flood Control Improvements for the Sacramento Area* (State Clearinghouse # 2006072098). Volume II of that EIR contained a project-level evaluation of the Natomas Cross Canal South Levee Phase 1 Improvements (Phase 1 Project). In 2007, SAFCA prepared the *EIR on the NLIP Landside Improvements Project* (State Clearinghouse # 2007062016), which covers the three additional phases of "landside" improvements to the levees protecting the Natomas Basin in Sacramento and Sutter Counties, including the Phase 2 Project and Phase 3 Project. The Phase 2 Project was analyzed at a project level and the remainder of the Landside Improvement Project was analyzed at a program level. On November 29, 2007, the SAFCA Board of Directors certified the EIR and approved implementation of the Phase 2 Project components proposed for construction in 2008. Following completion of the *EIR on the NLIP Landside Improvements Project*, USACE prepared an EIS to meet USACE's NEPA requirements to support USACE's decisions on 408 permission and 404 permitting. A Record of Decision (ROD) is expected to be signed by USACE in October 2008.

The EIS/EIR to be prepared for the Phase 3 Project will evaluate the environmental effects of the Phase 3 Project at a project level, and will evaluate subsequent phases of the Landside Improvements Project at a general, program level. These subsequent phases will be subject to additional project-specific NEPA and CEQA analysis in the future prior to approval and implementation.

PROJECT DESCRIPTION

The following objectives were adopted by SAFCA in connection with approval of the NLIP: (1) provide at least a 100-year level of flood protection to the Natomas Basin as quickly as possible, (2) provide "200-year" protection to the basin over time, and (3) avoid any substantial increase in expected annual damages as new development occurs in the basin.

The specific purpose of the Landside Improvements Project is to provide at least 100-year flood protection as quickly as possible while laying the groundwork to achieve at least "200-year" flood protection over time.

Additional project objectives adopted by SAFCA in connection with approval of the Phase 2 Project that are also applicable to the Phase 3 Project are to:

(1) use flood control projects in the vicinity of the [Sacramento International] Airport to facilitate changes in the management of Airport lands that reduce hazards to aviation safety, and

(2) use flood control projects to increase the extent and connectivity of the lands in Natomas being managed to provide habitat for giant garter snake, Swainson's hawk, and other special-status species.

The Phase 3 Project includes the following major activities, which will be analyzed at a project level in the EIS/EIR:

- Along the Sacramento River east levee, construct a raised adjacent setback levee from just north of Elkhorn Reservoir to just south of Interstate 5 (I-5) (Reaches 5A–9B) with cutoff walls and seepage berms where required to reduce seepage potential, and install woodland plantings.
- Widen the Pleasant Grove Creek Canal (PGCC) west levee between Howsley Road and Sankey Road and construct cutoff walls or seepage berms where required to reduce seepage potential.
- Widen the Natomas East Main Drainage Canal (NEMDC) west levee from Elkhorn Boulevard to the NEMDC Stormwater Pumping Station.
- Construct a cutoff wall in the NEMDC west levee from the NEMDC Stormwater Pumping Station to Northgate Boulevard where required to reduce seepage potential.
- Construct a new canal designed to provide drainage and associated giant garter snake habitat (referred to as the "GGS/Drainage Canal") between Elkhorn Reservoir and the West Drainage Canal at I-5, relocate the Elkhorn Canal downstream of Elkhorn Reservoir, and reconstruct the Reclamation District 1000 Pumping Plant No. 2.
- Recontour the land and create marsh and upland habitat at borrow locations.
- Realign and relocate irrigation and drainage canals and other infrastructure, such as utility poles, as needed to accommodate the flood control improvements.
- Remove encroachments as required to meet USACE, Central Valley Flood Protection Board, and Federal Emergency Management Agency (FEMA) criteria.

Phase 4 of the Landside Improvements Project will include the following activities that will be analyzed at a program level in the EIS/EIR:

- Along the Sacramento River east levee, construct an adjacent setback levee (raised where needed to provide adequate freeboard) from just south of I-5 to Gateway Oaks Drive (Reaches 10–20B) with cutoff walls and seepage berms where required to reduce seepage potential
- Construct a cutoff wall in the American River north levee between Gateway Oaks Drive and Northgate Boulevard where required to reduce seepage potential.
- Widen the NEMDC west levee from Sankey Road to Elkhorn Boulevard.
- Relocate the Riverside Canal, improve the West Drainage Canal south of I-5 to provide enhanced GGS habitat, and construct modifications to several pumping plants.
- Recontour the land and create marsh and upland habitat at borrow locations.
- Remove encroachments as required to meet USACE, Central Valley Flood Protection Board, and FEMA criteria.

PROBABLE ENVIRONMENTAL EFFECTS

The EIS/EIR will describe the direct and indirect significant environmental effects of the Phase 3 Project. The EIS/EIR will also evaluate cumulative effects of the project when considered in conjunction with the other phases of the Landside Improvements Project and other related past, present, and reasonably foreseeable future projects, including other SAFCA projects.

On the basis of preliminary evaluation, USACE and SAFCA have determined that the probable environmental effects of the proposed project are as follows:

- **Agricultural Resources**: Conversion of farmland to non-agricultural use; temporary effects on agricultural productivity.
- **Land Use and Socioeconomics**: Temporary disturbance of an existing community.
- **Topography, Geology, and Soils**: Potential for soil erosion or loss of topsoil during construction.
- **Hydrology and Hydraulics**: Minimized flood risk; potential temporary and/or permanent alteration of local drainage patterns; potential effects on groundwater recharge.
- **Water Quality**: Temporary effects on water quality during construction.
- **Fish and Aquatic Habitat**: Loss of fish or aquatic habitat through increased sedimentation and turbidity or release of contaminants during construction; loss of shaded riverine aquatic habitat (SRA).
- **Sensitive Aquatic Habitats**: Temporary disturbance or permanent loss of jurisdictional waters of the United States.
- **Vegetation and Wildlife**: Temporary disturbance or permanent loss of woodland habitats and wildlife corridors.
- **Special-Status Terrestrial Species**: Temporary disturbance or permanent loss of special-status species habitats; construction disturbance or take of special-status terrestrial species, especially to Swainson's hawk and giant garter snake.
- **Cultural Resources**: Disturbance of historic or archaeological resources.
- **Paleontological Resources**: Potential disturbance of previously undiscovered fossils during earthmoving activities.
- **Transportation and Circulation**: Temporary increase in traffic and traffic hazards on local roadways during construction; temporary closure of roadways during construction of flood control improvements across the roadways.
- **Air Quality**: Temporary increases in pollutant emissions associated with construction activities.
- **Noise**: Temporary increases in noise and vibration levels near sensitive receptors during construction.
- **Recreation**: Temporary disturbance of recreational uses at Teal Bend Golf Club; temporary closure of the Ueda Parkway bike trail on the NEMDC west levee.

- **Visual Resources**: Temporary and long-term changes in scenic views or visual character of the project area.
- **Utilities and Service Systems**: Temporary disruption of irrigation supply; potential disruption of utility service.
- **Hazards and Hazardous Materials**: Potential spills of hazardous materials; potential exposure to hazardous materials at project sites; potential for higher frequency of collisions between aircraft and wildlife at the Sacramento International Airport.

PUBLIC SCOPING MEETING

A public scoping meeting will be held to inform interested parties about the proposed project, and to obtain the views of agency representatives and the public on the scope and content of the EIS/EIR. The meeting will be held on Wednesday, August 6, 2008, from 4:00 to 7:00 p.m., at 1321 Garden Highway (Sierra Health Foundation) in Sacramento, California.

The meeting will have an open-house format with multiple stations set up to highlight different aspects of the proposed project and the NEPA/CEQA process. Attendees will have the opportunity to ask questions and discuss the project and the EIS/EIR process with project team members and to provide oral and written comments. The meeting space is accessible to persons with disabilities. Individuals needing special assistive devices will be accommodated to the best of our ability. For more information, contact Elizabeth Holland with USACE at (916) 557-6763 at least 48 hours before the meeting.

PROVIDING COMMENTS ON THE NOP

Interested parties may provide written or oral comments on the content and scope of the EIS/EIR at the public scoping meeting or may provide written comments directly to USACE or SAFCA. **Written comments must be provided to USACE or SAFCA at the earliest possible date, but must be received no later than 5 p.m. on Monday, August 18, 2008.** Agencies that will need to use the EIS/EIR when considering permits or other approvals for the proposed project should provide the name of a contact person. Comments provided by e-mail should include the name and address of the sender. Please send all written and/or e-mail comments to:

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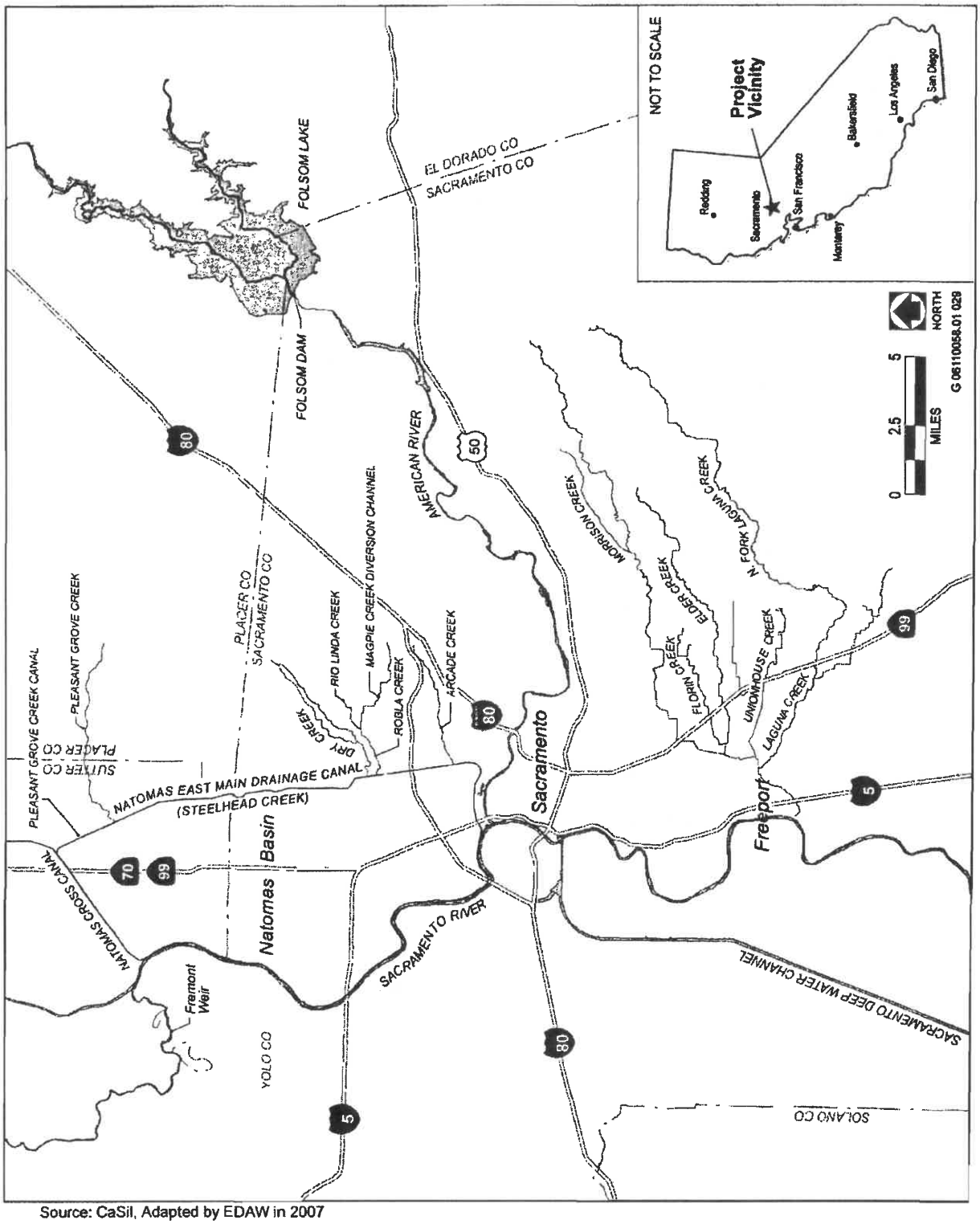

Source: CaSil, Adapted by EDAW in 2007

Project Location Exhibit

L3-1 As described in Section 1.1.1, "Scope of the Environmental Analysis," and Section 1.5.4, "Natomas Levee Improvement Program Environmental Documentation and Relationship of This EIS/EIR to Other Documents," in the Phase 3 DEIS/DEIR, USACE and SAFCA have prepared tiered documents that analyze the NLIP Landside Improvements Project, beginning with the broad, programmatic Local Funding EIR, Phase 2 EIR, Phase 2 EIS, Phase 2 SEIR, and Phase 3 DEIS/DEIR.

The Phase 3 DEIS/DEIR is tiered from the documents listed above as discussed in Section 1.1.1, "Scope of the Environmental Analysis," in the Phase 3 DEIS/DEIR. The Phase 3 Project is a specific action, separate from the Phase 1, 2, and 4 Projects. The Phase 3 DEIS/DEIR considers the environmental, cumulative, and growth-inducing impacts exclusive to the Phase 3 Project.

As such, the Phase 3 DEIS/DEIR does not violate NEPA because it tiers appropriately in accordance with NEPA and the CEQ Guidelines. Likewise, the Phase 3 DEIS/DEIR does not violate CEQA because the program-level analysis contained in previous NLIP environmental documents considered the "whole of the action"; the Phase 3 DEIS/DEIR considers the "whole of action" for the Phase 3 Project; and the NLIP environmental documents are tiered in accordance with the State CEQA Guidelines and Statues.

L3-2 USACE and SAFCA acknowledge that the commenter has attached to this comment letter (L3) four previous comment letters on previous environmental documents. These documents are part of the record for this EIR and have been considered by USACE and SAFCA in their decision-making. Responses to the comments in these attached letters have been provided previously, as described below; therefore, new responses are not provided in this FEIR.

- RD 2035 letter to USACE dated August 1, 2008: USACE received and considered the comments in this letter during the application review process for Section 404 permits for the NLIP.
- RD 2035 letter to USACE dated July 28, 2008: USACE provided responses to this comment letter (L2) in the Phase 2 FEIS (USACE 2008).
- RD 2035 letter to USACE dated January 18, 2008: USACE received and considered these scoping comments during preparation of the Phase 2 DEIS and FEIS (USACE 2008).
- RD 2035 letter to SAFCA dated October 29, 2007: SAFCA provided responses to this comment letter (13) in the Phase 2 FEIR (SAFCA 2007b).

L3-3 Comment noted; USACE and SAFCA acknowledge the history of RD 2035 and the Conway Preservation Group.

L3-4 See Response to Comment L3-1. The whole of the action has been and continues to be analyzed in each tiered document, as NEPA and CEQA allow.

The Phase 3 DEIS/DEIR appropriately considers hydraulic impacts to the Sacramento River. As discussed in Impact 4.4-a, "Hydraulic Impacts on Other Areas and Exposure to Flood Risk," in

the Phase 3 DEIS/DEIR, project implementation would not measurably alter water surface elevations or the existing geometry of the channels surrounding the Natomas Basin. Implementation of the Phase 3 Project also would not significantly alter water surface elevations in the larger Sacramento River Flood Control Project (SRFCP) (see Section 5.1.7, "Cumulative Impact Analysis: Project Impacts that Would Not be Cumulatively Considerable," and Appendix B of the Phase 3 DEIS/DEIR).

Management of erosion in all segments of the SRFCP is carried out on a systemwide basis by USACE, the California Department of Water Resources (DWR), and CVFPB under the authority of the Sacramento River Bank Protection Project. The purpose of this ongoing authority is to ensure that erosion risks are reduced as they are identified, so that the flood managers can maintain fit levees without being either hindered or helped by the condition of levees elsewhere in the system.

L3-5 The discussion of growth-inducing impacts in the Phase 3 DEIS/DEIR is tiered from Section 6.1 of the Local Funding EIR (SAFCA 2007a) and Section 4.2.5 of the Phase 2 EIR (SAFCA 2007b).

The growth-inducing impacts discussion discloses that improving the perimeter levee system would allow further development within the Natomas Basin (USACE and SAFCA 2009:5-33); however, much of the development has been previously planned by the City of Sacramento and Sutter County. The recently adopted City of Sacramento 2030 General Plan maintains the existing city boundaries for the most part and emphasizes infill and redevelopment as strategies for accommodating future growth in the region (City of Sacramento 2009). The 2030 General Plan Policy Area provides for expansion of the city boundaries to include the 577-acre Greenbriar project and the 1,465-acre Panhandle project in North Natomas. These two projects would result in development of approximately 6,575 new housing units. Additional planned development in the Natomas Basin would be the result of infill within the city boundaries. Projected growth is expected to add a total of 97,000 housing units by 2030 within the General Plan Policy Area (the Greenbriar and Panhandle projects are included in this figure).

In 2004, Sutter County voters passed Measure M, an advisory measure intended to provide the Sutter County Board of Supervisors with an indication of public sentiment regarding the types and level of development in the 7,500-acre area of the South Sutter County Industrial/Commercial Reserve in the northern part of Natomas. The southern boundary of the Measure M area forms the Sutter/Sacramento county line. Measure M did not approve any specific development proposals, but provides guidance for future development in the form of the following parameters for the South Sutter area:

- at least 3,600 acres of commercial and industrial parks to create new jobs in Sutter County as a condition of having residential units was approved;
- at least 1,000 acres would be provided for schools, parks, open space, libraries, retail areas, and other community facilities paid for by the development;
- no more than 2,900 acres would be available for residential construction on land protected, at a minimum, from a 100-year flood event; and,
- all necessary road, bridge, water drainage, sewer, and other improvements would be paid for by the development, without reducing current service levels.

The Sutter Pointe development, located within Sutter County in the northern part of the Natomas Basin, is proposed as a result of Measure M.

Further, regional planning reflects these growth plans. In December 2004, SACOG, representing the Counties of El Dorado, Placer, Sacramento, Sutter, Yolo, and Yuba and their 22 constituent cities, adopted the "Preferred Blueprint Scenario" to guide land use and transportation choices over the next 50 years as the region's population grows from its current population of 2 million to include more than 3.8 million people (see Plate14 in the Phase 3 DEIS/DEIR). The Blueprint project was initiated in 2002 to study future land use patterns and their potential effects on the region's transportation system, air quality, housing, open space, and other resources. Population projections for Sacramento County estimate 502,211 new residents by 2025 and for Sutter County 58,178 new residents by 2025 (SACOG 2005).

Even though the Phase 3 Project would make further growth possible in the Natomas Basin, SAFCA concluded that the Phase 3 Project would accommodate growth planned by agencies with local land use planning authority and in adopted land use planning documents. The Phase 3 Project is likely to avoid impacts on sensitive environmental resources that could occur if the growth currently projected and planned to occur in the Natomas Basin is forced to go elsewhere in the region due to inadequate flood protection. Thus, like the NLIP Landside Improvements Project as a whole (Local Funding EIR, Section 6.1.2), the Phase 3 Project would accommodate planned regional growth but would not be growth-inducing itself.

L3-6 The *Natomas Basin Habitat Conservation Plan* (NBHCP) was developed to promote biological conservation in conjunction with economic and urban development in the Natomas Basin (City of Sacramento, Sutter County, and TNBC 2003). The NBHCP authorizes incidental take associated with 17,500 acres of urban development in southern Sutter County and within the City of Sacramento and Sacramento County (i.e., 8,050 acres for the City of Sacramento; 7,467 acres for Sutter County; and 1,983 acres of Metro Air Park in Sacramento County).

For those areas in the northern Natomas Basin, not covered by the NBHCP, changes in local land use policy would be necessary to allow development. NBHCP issues would have to be evaluated separately as part of any proposed land use policy changes. SAFCA has no land use authority or jurisdiction over changes in local land use policy. Such changes would be the responsibility of the applicable jurisdiction with land use authority. At the present time, the Sutter Pointe Specific Plan project in Sutter County is the only development proposal in the northern portion of the Basin that is covered by the NBHCP.

L3-7 See Response to Comment L3-5 regarding the applicable planning projections for the project area. The cumulative impact analysis in the Phase 3 DEIS/DEIR, like the previous project-level EIRs for the other Phases, is tiered from the analysis in Chapter 5 of the Local Funding EIR and is based on a summary of projections contained in relevant planning documents (see CEQA Guidelines Section 15130(b)(1)(B); see also Phase 2 EIR, Section 4.1.2).

As stated in Section 5.1.1, "Geographic Scope and Timeframe," in the Phase 3 DEIS/DEIR, the timeframe for consideration of cumulative impacts is approximately 30 years, generally consistent with the timeframe for buildout of approved and proposed specific plan development projects in the Natomas Basin, as well as general plan buildout. Although the cumulative impacts of growth occurring in the Natomas Basin would be significant, the Phase 3 Project's impacts are predominantly associated with temporary and short-term construction activities that would take place over a few years but would not cumulate over the long term. Therefore, for those environmental resource areas that are associated with construction activities (e.g., air quality, noise, traffic), the Phase 3 Project would not make a cumulatively considerable contribution to significant cumulative impacts associated with long-term development of the Basin. However, the Phase 3 Project would make a significant contribution to agricultural and cultural resources impacts, which are also associated with growth and development in the Natomas Basin.

In addressing cumulative impacts related to the conversion of Important Farmland, the Phase 3 DEIS/DEIR notes the overall trend of conversion of Important Farmland associated with development activity in the Natomas Basin. The Phase 3 DEIS/DEIR concludes that the Proposed Action and the Levee Raise-in-Place Alternative would result in the conversion of farmland to nonagricultural uses and, in combination with the conversions of Important Farmland in the Natomas Basin associated with past, current, and future projects, would make a cumulatively considerable incremental contribution to this cumulatively significant impact (USACE and SAFCA 2009:5-24 and 5-25).

With respect to cultural resources, the Phase 3 DEIS/DEIR concludes that although mitigation would be implemented to reduce effects on potentially significant cultural resources, significant impacts, particularly on archaeological resources, may still occur. Losses of archaeological resources would add to an historical trend in the loss of these resources as artifacts of cultural significance and as objects of research importance (USACE and SAFCA 2009:5-28).

L3-8 Numerous alternatives have been considered by SAFCA to provide flood risk reduction to the Natomas Basin. These alternatives were evaluated and eliminated from further consideration during the ongoing environmental review process. More detailed information on alternatives considered but eliminated is provided in Appendix I, "Alternatives Formulation and Screening Details," of the Phase 3 DEIS/DEIR.

The alternatives carried forward in the Phase 3 DEIS/DEIR would not prejudice the state's FloodSAFE effort or other future efforts from identifying additional long-term solutions to the flood protection system deficiencies related to the river system, including improvements to the Yolo and Sacramento Bypass systems; rather, additional improvements would augment the NLIP.

See also Response to Comment I10-3.

L3-9 This comment suggests that the NLIP and the Phase 3 Project will use funding that would otherwise be used for other necessary flood risk reduction projects, including "comprehensive flood control solution[s]," and that this will lead to environmental impacts associated with potential flooding that should properly be analyzed in the Phase 3 DEIS/DEIR. This comment states that the use of limited funding for the NLIP will directly lead to flooding and associated environmental impacts elsewhere. These potential impacts proposed by the commenter are considered too speculative for meaningful consideration and thus are neither amenable to analysis nor within the scope of NEPA or CEQA.

Consideration of speculative environmental effects is not required under NEPA (Mandelker 2007: 8-102, citing *City of Riverview v. Surface Transp. Bd.,* 398 F 3d 434 [6th Cir. 2005]). While indirect effects must be analyzed under NEPA, this requirement does not extend to the attenuated future impacts that may occur but are not reasonably certain to occur (Mandelker 2007: 8-10, citing *First National Bank of Homestead v. Watson*, 363 F. Supp. 466 [D.D.C. 1973]). In *Watson* the court held that a Federal agency was not required to consider the environmental impact of potential development that might be funded by a new bank pending federal authorization of the new bank. The State CEQA Guidelines also do not require lead agencies to consider speculative impacts (State CEQA Guidelines Section 15145). Additionally, the State CEQA Guidelines Section 15358 defines environmental impacts as either primary effects that are caused by the project and occur in the same time and place, or secondary effects that are caused by the project and occur later in time or are farther removed in distance, but are still reasonably foreseeable (State CEQA Guidelines Section 15358[a]). Further, effects analyzed under CEQA must be related to a physical change (State CEQA Guidelines Section 15358[b]).

Here the commenter asserts that because the NLIP will use Federal, state, and local funds, other flood risk reduction projects will necessarily fail to occur and this lack of flood protection and improvement will lead to flooding and associated environmental impacts. Flood risk reduction projects are complex and take many years to plan, permit, and implement. Flooding is also impossible to predict with any degree of certainty and is generally only discussed in terms of probabilities. Because the comment offers no specific facts showing how specific projects would be deprived of funds and how this is clearly linked to any reasonably foreseeable environmental consequence, it is impossible to draw significance conclusions because it is currently unknown what the magnitude and extent of impacts would be and would be considered too speculative for meaningful consideration, which is beyond the scope of analysis required under NEPA and CEQA as presented above.

SAFCA has given careful consideration of funding mechanisms for flood risk reduction projects within their jurisdiction, which prompted the Development Impact Fee Program (Fee Program) adopted by the SAFCA Board of Directors in May 2008 (available at www.safca.org). Growth projections for the Fee Program are based on data provided by SACOG. The Fee Program would fund a series of flood risk reduction projects that would build on the accomplishments of SAFCA's Consolidated Capital Assessment District (CCAD). SAFCA has determined that there is sufficient Federal or state support and local funding through the CCAD to provide at least a 100-year level of flood protection to the Natomas Basin over the next 11 years. During this period, the Fee Program would provide a portion of the local share of the cost of achieving at least a "200-year" level of protection. Based on SACOG Blueprint projections, SAFCA estimates that over $400 million will be generated over the next 30 years as a result of the Fee Program.

L3-10 Flooding is impossible to predict with any degree of certainty and is generally only discussed in terms of probabilities. A 100-year flood is an event that has a 1% or greater annual probability of occurring. A "200-year" flood is an event that has a 0.5% or greater annual probability of occurring. Therefore, the probability of a flood event occurring would be the same every year (1% for the 100-year flood and 0.5% for the "200-year" flood). As discussed in Section 2.6, "Environmentally Superior Alternative," in the Phase 3 DEIS/DEIR, the State CEQA Guidelines (Section 15126.6[e][2]) require that if the no project alternative is determined to be the environmentally superior alternative, the EIR shall also identify an environmentally superior alternative among the other alternatives. For the Phase 3 Project, the No-Action Alternative (i.e., no project alternative) contains two components: "No Project Construction" would be the immediate situation if the project were not approved and implemented (see Section 2.2.1.1, "No Project Construction," in the Phase 3 DEIS/DEIR) and "Potential Levee Failure" would be the situation if the Natomas Basin perimeter levee system failed (see Section 2.2.1.2, "Potential Levee Failure," in the Phase 3 DEIS/DEIR). Even if the No-Action alternative was determined to be environmentally superior, which is not the case because of its potential levee failure component, another project alternative would be required to be identified as the environmentally superior alternative, as described above per CEQA.

As shown in Table 2-3 in the Phase 3 DEIS/DEIR, the No-Action Alternative (No Project Construction) would be environmentally superior to the Proposed Action for all of the environmental resource areas analyzed except vegetation and wildlife and visual resources, because of the extensive removal of woodlands and riparian vegetation that would occur along the waterside of the Sacramento River east levee to conform with USACE guidance regarding levee encroachments. However, the No-Action Alternative (Potential Levee Failure) would be environmentally superior to the Proposed Action in only one of the environmental resource areas analyzed, noise, because this alternative would not involve the noise-generating construction work that would occur with the Proposed Action.

The No-Action Alternative (Potential Levee Failure) would result in a significant and unavoidable impact related to hydrology and hydraulics (Impact 4.4-a, "Hydraulic Impacts on Other Areas and Exposure to Flood Risk"), as shown in Table 2-3 in the Phase 3 DEIS/DEIR, rendering it environmentally inferior to the Proposed Action, which was proposed to address this very issue (see Section 1.4.2, "Need for Action," in the Phase 3 DEIS/DEIR).

For the reasons described in the Phase 3 DEIS/DEIR, the Proposed Action is the environmentally superior alternative.

As the commenter correctly notes, the No-Action Alternative (Potential Levee Failure) could result in a beneficial impact on biological resources. This potential is acknowledged in the Phase 3 DEIS/DEIR analyses. For example, Impact 4.6-b, "Loss of Shaded Riverine Aquatic Habitat Associated with Levee Improvement Areas," states: "Absence of improvements [to the Natomas Basin perimeter levee system] could have adverse or beneficial impacts on shaded riverine aquatic (SRA) habitat, depending on timing, location, magnitude, and duration of flooding." This potential benefit is also acknowledged for waters of the United States (Impact 4.7-a), woodland habitats (Impact 4.8-a), wildlife corridors (Impact 4.8-b), special-status plant species (Impact 4.9-a), and valley elderberry longhorn beetle (Impact 4.9-b). However, uncontrolled flooding would cause substantial damage to TNBC marsh and agricultural facilities.

L3-11 The commenter suggests that the Phase 3 DEIS/DEIR concludes that no feasible mitigation exists in far too many resource categories. As described in the Executive Summary of the Phase 3 DEIS/DEIR, there are five environmental resource areas in which the Proposed Action would result in significant and unavoidable impacts: agricultural resources, land use/socioeconomics, cultural resources, noise, and visual resources. For the Levee Raise-in-Place Alternative, there are three additional environmental resource areas in which there would be significant and unavoidable impacts: vegetation and wildlife, transportation and circulation, and recreation. For these environmental resource areas, mitigation measures have been identified to reduce these impacts; however, these impacts cannot be reduced to a less-than-significant level and would remain significant and unavoidable even after mitigation.

The commenter further suggests that the Phase 3 DEIS/DEIR should disclose what mitigation for cumulative impacts to habitat, traffic, air quality, and water quality impacts were investigated and why they were dismissed. The project's contribution to cumulative impacts is considered cumulatively considerable only for agricultural resources related to the permanent conversion of Important Farmland to nonagricultural uses, and for cultural resources (see Sections 5.1.8.1, "Agricultural Resources," and 5.1.8.4, "Cultural Resources," of the Phase 3 DEIS/DEIR). Mitigation measures are required for impacts to agricultural and cultural resources (see mitigation measures in Sections 4.1, "Agricultural Resources," and 4.10, "Cultural Resources," respectively). The Phase 3 DEIS/DEIR concluded that the project would not make a cumulatively considerable contribution to significant cumulative impacts related to transportation and circulation, water quality, biological resources (habitat), and air quality (see Sections 5.1.7, "Cumulative Impact Analysis: Project Impacts that Would Not be Cumulatively Considerable," 5.1.8.2, "Water Quality/Fisheries," 5.1.8.3, "Terrestrial Biological Resources," and 5.1.8.5, "Air Quality," in the Phase 3 DEIS/DEIR).

In general, where feasible mitigation exists, it has been identified in the Phase 3 DEIS/DEIR and will be implemented by SAFCA. In the commenter's example, purchase of farmland conservation easements can prevent future conversions of the preserved farmlands. As described in Section 3.3.1. "Agricultural Resources," of the Phase 3 DEIS/DEIR and in the Local Funding EIR (SAFCA 2007a), the Governor signed Assembly Bill 930 into law in October 2007, amending the Sacramento Area Flood Control Agency Act of 1990 to make explicit SAFCA's authority to

acquire agricultural preservation easements from willing sellers outside its jurisdiction, provided such acquisition is consistent with applicable county plans and the State Plan of Flood Control. In fact, SAFCA recently cooperated with Yolo County, DWR, the Yolo Land Trust, and the Sacramento Valley Conservancy in acquiring and recording agricultural conservation easements on approximately 1,660 acres of agricultural land in the Elkhorn Basin, located directly across the Sacramento River from the Natomas Basin in Yolo County. However, preservation easements cannot compensate for Important Farmland acreage that has been permanently lost due to conversion to a non-agricultural use (see Mitigation Measures 4.1-a, "Minimize Important Farmland Conversion to the Extent Practicable and Feasible," and 4.1-b, "Minimize Impacts on Agricultural Preserve Land and Williamson Act–Contracted Land; Comply with Government Code Sections 51290–51293; and Coordinate with Landowners and Agricultural Operators," in the Phase 3 DEIS/DEIR). There are no feasible mitigation measures that can be applied that would replace converted farmland.

L3-12 The commenter asserts that the Phase 3 DEIS/DEIR improperly incorporates material from other CEQA documents SAFCA has prepared for the NLIP, but provides no specific page citations or examples upon which to respond. Absent specific facts, it is not possible to respond to this assertion meaningfully.

The commenter also asserts that the Phase 3 DEIS/DEIR improperly uses the incorporation by reference provision under CEQA. To respond to this assertion, this response reviews the relevant standards for NEPA and CEQA and then examines the sections of the Phase 3 DEIS/DEIR where material is incorporated by reference.

As stated in the Phase 3 DEIS/DEIR, incorporation by reference is encouraged by both NEPA (40 CFR 1500.4, 1502.21) and CEQA (State CEQA Guidelines Section 15150), especially in a tiered document (State CEQA Guidelines Section 15152(a)). Both NEPA and CEQA require brief citation and summary of the referenced material and the public availability of this material. CEQA also requires citation of the state identification number of the previous EIR or EIRs cited (State CEQA Guidelines Section 15150[d]). Printed copies of relevant documents are available to the public at SAFCA's office at 1007 7th Street, 7th Floor, Sacramento, California, as stated in the Phase 3 DEIS/DEIR. The Phase 3 DEIS/DEIR also provides the relevant identification numbers for previous EIRs. The referenced documents and State Clearinghouse identification numbers are again provided here:

- *Environmental Impact Report on Local Funding Mechanisms for Comprehensive Flood Control Improvements for the Sacramento Area* (SAFCA 2007a), State Clearinghouse Number 2006072098;
- *Environmental Impact Report on the Natomas Levee Improvement Program, Landside Improvements Project* (SAFCA 2007b), State Clearinghouse Number 2007062016; and
- *Environmental Impact Statement for 408 Permission and 404 Permit to Sacramento Area Flood Control Agency for the Natomas Levee Improvement Project* (USACE 2008).

To fully respond to this comment it is necessary to review examples of material incorporated by reference in the Phase 3 DEIS/DEIR:

- Alternatives from previous environmental documents prepared for the NLIP are incorporated by reference in Chapter 2.0, "Alternatives," and are summarized in Appendix I (USACE and SAFCA 2009:I-5 through I-6 and I-15 through I-16). This discussion serves to demonstrate the range of alternatives previously considered, but eliminated from further detailed consideration and alternatives that were considered in detail in previous documents. Because

the original material is summarized in the Phase 3 DEIS/DEIR, is available for inspection at SAFCA's office, and is provided with reference to the State Clearinghouse reference number, it is appropriately incorporated by reference under NEPA and CEQA.

- The analysis of cultural resource impacts, Impact 4.10-e, "Potential Discovery of Human Remains during Construction," incorporates by reference Impact 3.8-e from the Phase 2 EIR (SAFCA 2007b:3.8-32). This impact and mitigation measure identify the potential for NLIP activities to inadvertently disturb and disinter buried human skeletal remains and to result in significant and unavoidable impacts on these resources. The identified mitigation in the Phase 2 EIR requires that if human remains are disinterred, work will cease and applicable notices required under state law will be performed (SAFCA 2007b:3.8-.32 to 3.8-33). Because this information is summarized, is available for review at SAFCA's office, and is provided with the State Clearinghouse reference number for the previous documents, it is appropriately incorporated by reference under NEPA and CEQA.

- The analysis of cumulative impacts and growth inducement incorporates analysis from previous environmental documents by reference. Section 5.1.3, "Summary of Cumulative Impact Analyses from Previous Natomas Levee Improvement Program Environmental Documents," summarizes the cumulative impacts for previous documents prepared for the NLIP (USACE and SAFCA 2009:5-3). Section 5.2.2, "Incorporation by Reference," summarizes the analysis of growth-inducing effects and also summarizes SAFCA's previous conclusion that the NLIP, as a program, would not directly induce growth (USACE and SAFCA 2009:5-33). Because the documents that are referenced are available for inspection at SAFCA's office, the relevant facts are summarized in the Phase 3 DEIS/DEIR, and references to these documents are provided with the State Clearinghouse reference number, the incorporation of this material satisfies the standard given in the State CEQA Guidelines and the CEQ regulations.

The documents that supply analysis incorporated by reference are also cited in Chapter 1.0, "Introduction and Statement of Purpose and Need," in the Phase 3 DEIS/DEIR, with the cover page and title of each document provided again in Appendix K of the Phase 3 DEIS/DEIR. Collectively, these sections in the Phase 3 DEIS/DEIR provide a brief review of analysis and conclusions that have been performed for the NLIP to orient the reader to the overall framework in which the Phase 3 Project will occur and the basis for the conclusions provided in the Phase 3 DEIS/DEIR. This use of the incorporation by reference provisions in NEPA and CEQA provides useful background without reproducing in full the original material, and thus functions as intended under NEPA and CEQA.

L3-13 The hydraulic impacts of the Phase 3 Project are addressed under Impact 4.4-a, "Hydraulic Impacts on Other Areas and Exposure to Flood Risk," in the Phase 3 DEIS/DEIR, which concluded that the action alternatives would not change the existing geometry of the channels surrounding the Natomas Basin and, therefore, would not cause significant changes to water flow in these channels or cause adverse hydraulic effects upstream or downstream of the project area during peak flows. The Phase 2 FEIR, Response 13-4, addressed the issue of whether or not SAFCA's flood risk reduction projects would result in increased flood risks to RD 2035. The response noted that the levees on the west side of the Sacramento River would continue to have the same risk of failure with or without implementation of the Phase 2 Project because these levees would continue to be exposed to conditions similar to pre-project conditions. The same is true for the Phase 3 Project.

L4

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April 6, 2009

Elizabeth Holland, Planning Division
U.S. Army Corps of Engineers, Sacramento Division
1325 J Street
Sacramento, CA 95814
Elizabeth.G.Holland@usace.army.mil

Dear Ms. Holland:

The Twin Rivers Unified School District (District) appreciates this opportunity to comment on the Draft Environmental Impact Statement (DEIS) and Draft Environmental Impact Report (DEIR) on the Natomas Levee Improvement Program, Phase 3 Landside Improvements Project (Project). A portion of the proposed levee improvements fall along the District's East Natomas Education Complex (ENEC) south of Elkhorn Boulevard and north of the northern end of Sorrento Road.

Upon further discussion with District consultant, Sage Institute, Inc, the District wishes to receive further clarification regarding the specific methods for improvements adjacent to District property, specifically encroachment onto District property for access and/or construction purposes. For example, it is the District's understanding that the Project would construct a cutoff wall and landside berm within the footprint of the existing levee on the ENEC property. This proposed project construction would likely require expansion of the levee footprint and/or construction access along the landside toe of the levee through the District's property.

L4-1

The District established a temporary 200-foot construction non-disturbance buffer zone for the giant garter snake along this reach, but is not obligated to preserve the buffer zone and therefore may have use for this buffer zone as a part of the ENEC.

Therefore, the District desires further clarification of how much, if any, land would be required for the proposed project improvements as well as acknowledgment that all appropriate regulatory compliance measures will be obtained by the Corps and/or the Sacramento Area Flood Control District.

Please forward appropriate response to Mr. Jeff Doyle at jeff.doyle@twinriversusd.org with copy to Dr. Joel Kirschenstein, Sage Institute Inc., at joel@sageii.com.

Sincerely,

Joel Kirschenstein, President
Sage Institute Inc.
District Consultant on behalf of Twin Rivers Unified School District

Cc: Mr. Alan Colombo, Asst Superintendent Facilities, TRUSD
Mr. Jeff Doyle, Manager of Facilities Planning, TRUSD

Public Policy Consulting / Environmental & Biological Consulting

Letter	Twin Rivers Unified School District
L4	Joel Kirschenstein, President, Sage Institute Inc.
Response	District Consultant on behalf of Twin Rivers Unified School District
	April 6, 2009

L4-1 The proposed NEMDC west levee improvements from Elkhorn Boulevard south to Northgate Boulevard include construction of a cutoff wall in the existing levee. The existing maintenance area along the NEMDC west levee between the NEMDC Stormwater Pumping Station and Elkhorn Boulevard would not provide adequate space for levee reshaping proposed by the Phase 3 Project; thus SAFCA anticipates acquiring additional property owned by the Twin Rivers Unified School District. The precise area needed for acquisition is yet to be determined.

Per Public Resources Code Section 21151.4, SAFCA provided written notification to the Twin Rivers Unified School District on April 21, 2009, to provide notice and initiate discussion regarding the potential impacts to school sites within ¼ mile of the proposed construction along the NEMDC. SAFCA is committed to good communications with potentially affected property owners and businesses throughout project planning and implementation, and will coordinate and provide additional details and clarification to Twin Rivers Unified School District as needed.

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L5

Municipal Services Agency

Department of Transportation
Michael J. Penrose, Director

Terry Schutten, County Executive
Paul J. Hahn, Agency Administrator

County of Sacramento

April 6, 2009

John Bassett
Director of Engineering
Sacramento Area Flood Control Agency
1007 Seventh Street, 7th Floor
Sacramento, CA 95814

SUBJECT: COMMENTS ON THE DRAFT ENVIRONMENTAL IMPACT STATEMENT (EIS)/ENVIRONMENTAL IMPACT REPORT (EIR) ON THE NATOMAS LEVEE IMPROVEMENT PROGRAM PHASE 3 LANDSIDE IMPROVEMENTS PROJECT.

Dear Mr. Bassett:

The Sacramento County Department of Transportation (SACDOT) has reviewed the DEIS/EIR for the Natomas Levee Improvement Program (NLIP), Phase 3 Landside Improvements Project, dated February 2009. We have previously submitted a comment letter on the NOP for DEIR/EIS of this project, dated August 13, 2008. We appreciate the opportunity to review this document. We have following comments to offer: L5-1

- Coordinate with the SACDOT staff in implementing the Traffic Safety and Control Plan for construction related truck traffic. L5-2
- Coordinate the improvements plans with SACDOT for review and approval of the public roadways, Teal Bend Golf Course driveway and private farms roads that will be modified as part proposed project. L5-3
- Coordinate the closure of Garden Highway with SACDOT that will affect the County residents. L5-4
- We are currently working with SAFCA staff to include the recreational bike/pedestrian path in the project description of the phase 4B DEIS/DEIR. SACDOT staff will provide the project description for the bike/pedestrian path to the SAFCA in a timely manner. L5-5
- Power poles relocations shall be coordinate with SMUD and SACDOT to avoid conflicts with the intended bike/pedestrian path. L5-6

SAFCA '09 APR 9 PM2:04

"Leading the Way to Greater Mobility"

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Operations & Maintenance: 4100 Traffic Way, Sacramento, CA 95827 . Phone: 916-875-5123 . Fax: 916-875-5363
www.sacdot.com

Should you have any questions, please feel free to contact me at (916) 874-6121 or Kamal Atwal at (916) 875-2844

Sincerely,

Kamal Atwal

for Dean Blank, P.E.
Principal Civil Engineer
Department of Transportation

DB:ka

c: Dan Shoeman, DOT
Matt Darrow, DOT
Kamal Atwal, DOT
Ron Vicari, DOT
Rizaldy Mananquil, DOT
Steve Hong, County Engineering
Tricia Stevens, Planning and Community Development Department

L5-1 Comment noted; SAFCA received the County of Sacramento Department of Transportation's (SACDOT's) comment letter on the NOP for the Phase 3 DEIS/DEIR and considered it during preparation of the Phase 3 DEIS/DEIR.

L5-2 Mitigation Measure 4.12-a, "Prepare and Implement a Traffic Safety and Control Plan for Construction-Related Truck Trips," subpart (b) requires that the traffic safety and control plan be submitted to local jurisdictions, including Sacramento County, prior to initiation of construction-related activity involving high volumes of traffic.

L5-3 SAFCA will, as the commenter requests, coordinate with SACDOT for its review and approval of roadway improvement plans. Mitigation Measure 4.12-a, "Prepare and Implement a Traffic Safety and Control Plan for Construction-Related Truck Trips," in the Phase 3 DEIS/DEIR requires: "before the start of the first construction season, SAFCA shall coordinate with Sacramento and Sutter Counties to address maintenance and repair of affected roadways resulting from increased truck traffic." This would include public roadways that may be modified as part of the Phase 3 Project.

L5-4 Mitigation Measure 4.12-a has been revised (see Chapter 4.0, "Revisions to the DEIS/DEIR," of this FEIR for the text revision) to require SAFCA and its primary contractors to coordinate with Sacramento and Sutter Counties regarding any closures of Garden Highway that would be required for project construction.

L5-5 Comment noted; SACDOT is working with SAFCA on a project description, which will be provided to SAFCA in a timely manner, for a SACDOT sponsored recreational bike/pedestrian path to be included in the Phase 4b Project, which will be the subject of a separate EIS/EIR to be prepared in the future.

L5-6 Comment noted; power pole relocations will be coordinated with the Sacramento Municipal Utility District and SACDOT to avoid conflicts with the intended bike/pedestrian path. Mitigation Measure 4.17-b has been revised as such. See Chapter 4.0, "Revisions to the DEIS/DEIR," of this FEIR for the text revision.

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O1

Reach Seven Property Owners

April 2, 2009

John Bassett, Director of Engineering
SAFCA
1007 Seventh Street, 7th Floor
Sacramento, CA 95814

Elizabeth Holland, Planning Division
USACE, Sacramento District
1325 J Street
Sacramento, CA 95814

Dear SAFCA and USACE:

We are property owners in the Reach Seven area of the Natomas Levee Improvement Program and we are submitting the following comments as part of the joint EIR/EIS process for the Phase Three Landside Improvements Project.

1. By not making a final selection of the surface mines (borrow sites) required by the project, the EIR/EIS fails to meet the requirement of California Code of Regulations 15142(a) to identify "the precise location and boundaries of the proposed project". Without specific locations, it is impossible for Reach 7 property owners to understand the scope and substantial impacts of the surface mining operations SAFCA will conduct in its neighborhood, potentially directly across the street from their homes. SAFCA's denial of a California Public Records Act request for additional information about the Reach 7 borrow pits undermines confidence in SAFCA's project planning process and calls into question SAFCA's commitment to the full disclosure needed for the meaningful public review guaranteed by the California Environmental Quality Act and the National Environmental Policy Act. It is inconceivable that an EIR/EIS for a non-governmental agency would ever be approved without identifying specific surface mine locations. O1-1

   Proposed change: Include a list of specific locations that SAFCA has decided will be used for surface mining.

2. The EIR/EIS does not commit SAFCA to seek a Surface Mining and Reclamation Act (CA PRC 2710) permit nor to comply with its disclosure, mitigation and reclamation provisions. California law recognizes the significant impact of surface mining operations and the importance of prompt, appropriate reclamation of closed mining sites. Reach 7 property owners are very concerned that SAFCA will be seeking an exemption from SMARA, especially when the Sacramento County Counsel's Office that will be advising SAFCA on its exemption request will also provide advice to the County of Sacramento that will be acting as the lead agency in approving the same request. This blatant conflict of interest can best be resolved by having SAFCA agree to SMARA's provisions that provide substantial health, safety, property value and reclamation protections for the environment and the residents of impacted area. Given the extended project timelines and funding difficulties clearly described in SAFCA's March 19 2009 Staff Report (Item 8), it is essential Reach 7 property owners get full legal assurances that the surface mining activities will be completed quickly and cleaned up to the highest standards, including the affected surrounding lands protected by CA PRC 2733. O1-2

   Proposed Change: SAFCA commits to fully complying with SMARA – with Sacramento County eliminating any conflict of interest by delegating authority over SAFCA's permit to the California Department of Conservation.

3. The EIR/EIS lists numerous "significant and unavoidable" health, safety and environmental impacts in the Reach 7 area but stops short of proposing permanent improvements or financial mitigations to offset them. It is particularly worrisome that SAFCA recognizes that the noise, air emissions, traffic and vibration impacts they intend to limit to 7:am to 6:pm weekday time period may have to be extended to 24 hours a day, seven days a week as a result of construction delays. By offering compensation to other property owners, SAFCA recognizes these operations will substantially impair their quality of life and property values on a temporary basis, but none is offered to the Reach 7 property owners who will suffer them for the duration of Phase Three work. Indeed, during a recent meeting, SAFCA staff absurdly said that Reach 7 property owners with a surface mine next to their properties would not experience any additional burdens beyond other area property owners. It would be most appropriate for SAFCA to reach a financial compensation agreement with impacted residents for losses to property value and enjoyment during the construction period and final reclamation of all surface mining impacts. O1-3

Proposed Change: Negotiate a financial compensation plan for "significant and unavoidable" impacts unique to Reach 7 property owners, including construction outside regular working hours and the loss of property use and value during the project.

O1-3 Cont.

4. Although the plan anticipates using construction roads for surface mine truck traffic, there will be an undeniable increase in traffic on the Garden Highway from other project related activities – a rural road that already supports recreational, agricultural and commercial uses. While these impacts are unavoidable, they can be mitigated by moving the Garden Highway to the center of the levee once construction is complete. Such an improvement would mitigate traffic impacts during the reclamation of Phase 3 and Phase 4 construction activities. Furthermore, moving the road away from driveways and providing wide shoulders would enhance traffic safety and recreational use after the project's completion. Indeed, it would be negligent for the SAFCA and the County of Sacramento to pass up this opportunity to improve traffic safety on the Garden Highway, where serious and fatal accidents are all too common. Clearly county taxpayers would incur a glaring liability by government's failure to act at this opportune moment.

   O1-4

   Proposed Change: Commit to moving the Garden Highway to the center of the new levee crown.

5. We are concerned that SAFCA anticipates publishing a final EIR/EIS 30 days after the close of the comment period. We believe the issues raised here are significant enough to warrant a recirculation of a new draft EIR/EIS, believing the current draft is so fundamentally inadequate and conclusory in nature that meaningful public review and comment are precluded.

   O1-5

   Proposed Action: Re-circulate the EIR/EIS and allow an appropriate time to provide informed comment on the proposed changes.

The undersigned Reach 7 property owners recognize the importance of the NLIP to our region and do not intend to cause any delay in completion of the project. Furthermore, we recognize that the NLIP will permanently degrade the environment in our community and are willing to trade those losses for adequate compensation during the construction period and a permanent improvement in traffic safety along the Garden Highway. We are hopeful that SAFCA will agree to our proposed changes, but we are prepared to litigate should SAFCA provide an inadequate response to them. SAFCA's refusal to provide information about its plans for our neighborhood

O1-6

and its dismissal of our concerns to-date appears to favor confrontation over cooperation – a stance that is inconsistent with efficient project management and good public policy.

O1-6
Cont.

Respectfully Submitted,

Glen Boyd, 7027 Garden Highway

Dan Pellissier, 7021 Garden Highway

Laura Pellissier, 7021 Garden Highway

Mark Timmerman, 7011 Garden Highway

Pat Waltz, 7001 Garden Highway

Linda Waltz, 7001 Garden Highway

Chris Cully, 6991 Garden Highway

Raylene Cully, 6991 Garden Highway

O1-1 This comment suggests that SAFCA has violated the requirements of the State CEQA Guidelines, and cites Section 15142(a). The quoted language actually comes from Section 15124(a), which requires that "the precise location and boundaries of the proposed project shall be shown on a detailed map, preferably topographic." The commenter interprets this section to require the lead agency to identify a limited, discrete footprint in which borrow activity will occur, with no deviation from the activity described in the Phase 3 DEIS/DEIR.

The description of the Proposed Action is provided in Chapter 2.0, "Alternatives," in the Phase 3 DEIS/DEIR. Potential borrow sites are described in Section 2.3.8.3, "Potential Borrow Sites," and shown in Table 2-2 and Plate 10, which clearly depicts borrow locations and associated haul routes. Because the Phase 3 DEIS/DEIR provides both a narrative description and depiction of the proposed borrow locations, it satisfies the requirements of Section 15124(a).

Section 2.3.8.4, "Borrow Site Program," in the Phase 3 DEIS/DEIR discusses selection of specific borrow sites within the Elkhorn Borrow Area. The Elkhorn Borrow Area is analyzed at a program level in the Phase 3 DEIS/DEIR, which also includes a checklist of potential impacts and corresponding mitigation measures related to the Elkhorn Borrow Area (Appendix J of the Phase 3 DEIS/DEIR). The checklist is a tool, pursuant to the State CEQA Guidelines 15168(c), that allows the lead agency to determine if additional significant impacts, would occur, thus requiring subsequent documentation.

The comment suggests that the project description must identify the exact footprint in which borrow will occur. As described in Section 2.3.8, "Borrow Material" in the Phase 3 DEIS/DEIR, SAFCA has identified a number of potential borrow sites and evaluated the potential environmental impacts that would occur as a result of the use of these sites. The precise location of borrow removal from sites identified in Table 2-2 in the Phase 3 DEIS/DEIR may vary due to a variety of factors. Some sites may not have sufficient quantities of suitable material that meets the engineered specifications for the fill required for improvements. The precise quantity of suitable material that a site contains is not able to be completely determined in advance of excavation. Furthermore, the western portion of the Natomas Basin that abuts the east bank of the Sacramento River is sensitive for buried archaeological deposits that exist below grade with little or no surface manifestation (USACE and SAFCA 2009: 4.10-11). Other factors such as the proximity to sensitive receptors may also require adaptive changes in the precise location of borrow material. Because of the need to retain flexibility in borrow supply planning, the Phase 3 DEIS/DEIR provides a program-level analysis of borrow sites, as described in Appendix J of the Phase 3 DEIS/DEIR. CEQA specifically authorizes adaptive planning and flexibility for actions within a program (see State CEQA Guidelines Section 15168[c][4]). Under Section 15168(c), SAFCA is authorized to consider borrow sites at a general level of detail. When SAFCA then identifies more precise locations within the Elkhorn Borrow Area that may supply fill for the Phase 3 Project improvements, this activity will be reviewed to determine if it would generate new impacts or greater impacts relative to those identified in the Phase 3 DEIS/DEIR as described in Appendix J of the Phase 3 DEIS/DEIR.

Since issuance of the Phase 3 DEIS/DEIR, SAFCA has narrowed the focus of its planning for the Elkhorn Borrow Area. See Chapter 2.0, "Changes to the Phase 3 Project and Master Responses to Comments on the DEIS/DEIR," of this FEIR for additional details.

O1-2 This comment raises several issues relating to the application of and SAFCA's compliance with the Surface Mining and Reclamation Act (SMARA) (California Public Resources Code [PRC] Section 2710 et seq.). Each issue is addressed in turn.

First, the commenter suggests that the Phase 3 DEIS/DEIR does not commit SAFCA to obtain a SMARA permit or comply with the requirements of SMARA. However, SAFCA's duty to comply with SMARA is a separate statutory obligation that is unrelated to and does not depend on CEQA. Nevertheless, this response reviews relevant text from the Phase 3 DEIS/DEIR to demonstrate that SAFCA is committed to complying with SMARA by either securing permits or demonstrating that a specific borrow operation qualifies for an exemption from SMARA. The Phase 3 DEIS/DEIR acknowledges that borrow activity is subject to regulation under SMARA (USACE and SAFCA 2009:4.3-2). Mitigation Measure 4.3-a(2), "Secure and Implement the Conditions of the California Surface Mining and Reclamation Act Permit," provides that SAFCA will obtain approvals under SMARA as appropriate. The requirements of SMARA are also described in the Phase 3 DEIS/DEIR as follows:

> Activities subject to SMARA include, but are not limited to, mining of minerals, gravel, and borrow material. The SMARA statute requires mitigation to reduce adverse impacts on public health, property, and the environment. Because SAFCA would require borrow material for project construction, SAFCA must comply with SMARA (USACE and SAFCA 2009:6-11).

As described in Section 6.2.2, "California Surface Mining and Reclamation Act," in the Phase 3 DEIS/DEIR, SAFCA will satisfy SMARA by securing either a permit, with the attendant reclamation plan and financial assurances, or an exemption consistent with the SMARA statute and local codes (see, e.g., Sacramento County Code Section 20.04.040[A] through 20.04.040[F]).

Second, the commenter suggests that there is a conflict of interest because Sacramento County Counsel would advise both SAFCA and the County on the application and validity of any exemptions under SMARA. This is incorrect; SAFCA has its own Agency Counsel.

Additionally, from October 2008 through April 2009 Sacramento County Counsel provided a Supervisor Deputy who acted as SAFCA's interim Agency Counsel for limited purposes. This Supervisor Deputy County Counsel did not advise either SAFCA or Sacramento County on SMARA issues. Moreover, there is a Senior Planner in both Sacramento and Sutter Counties who determines a project's compliance with SMARA. Accordingly, for any borrow activity in Sacramento County, SAFCA would submit an application for a permit, including a reclamation plan, and financial assurances to the Sacramento County Planning and Community Development Department or provide the County with evidence demonstrating that the activity qualifies for an exemption from SMARA. Sacramento County's designated Senior Planner would then review SAFCA's permit application or its request for an exemption and determine SMARA compliance.

The purpose of SMARA is to ensure "adverse environmental effects are prevented or minimized and that mined lands are reclaimed to a usable condition which is readily adaptable for alternative land uses" (California PRC Section 2712[a]). This requirement is satisfied in one of two ways. Mine operators may satisfy this requirement by securing an approved reclamation plan and financial assurance that demonstrates how mined lands would be restored and ensures that funds are available to do so. In other instances, the nature of the project itself ensures that the general requirement that mined lands are reclaimed would be satisfied at a specific site. These situations may fall within the exemption provided in California PRC Section 2714(b). Sutter County approved an exemption from SMARA, under this section, for the Brookfield borrow site in the northern portion of the Natomas Basin (Mueller 2009) and Sacramento County likewise has

approved an exemption for the Airport North Bufferlands (Gamel 2009). In no instance would SAFCA undertake borrow operations without either a permit, including an approved reclamation plan, and financial assurance, or an exemption. The impact of borrow activity, including generation of noise, dust, and vehicle emissions, is covered in the discussion of noise and air quality impacts in the Phase 3 DEIS/DEIR.

O1-3 Financial compensation to individuals is beyond the required scope of analysis required under NEPA and CEQA. However, USACE and SAFCA are committed to maintaining good communications with potentially affected residents and business owners throughout project planning and construction. See also Master Response: 24/7 Cutoff Wall Construction.

O1-4 Mitigation Measure 4.12-b, "Implement Mitigation Measure 4.12-a, [Prepare and Implement a Traffic Safety and Control Plan for Construction-Related Truck Trips]," in the Phase 3 DEIS/DEIR addresses temporary increases in traffic and traffic hazards on local roadways from construction of the Phase 3 Project. Although moving the Garden Highway away from driveways on the water side of the levee to provide a wider shoulder could potentially improve traffic safety, existing traffic safety conditions along the highway is not an impact of the Phase 3 Project, and CEQA does not require SAFCA to mitigate these existing conditions. It should be noted that under the Proposed Action, in which an adjacent setback levee would be constructed in Reaches 5A–9B of the Sacramento River east levee, the new levee would be higher than the existing levee on which the Garden Highway is currently located (see Plate 15 in the Phase 3 DEIS/DEIR). The levee height deficiencies that the Proposed Action would address are shown on Plate 3 in the Phase 3 DEIS/DEIR. Relocating the Garden Highway to the centerline of the widened levee would likely result in the northbound lane of the highway being 1–2 feet above the southbound lane. This split-level highway configuration would potentially create new traffic safety hazards and complicate access to and from waterside driveways.

O1-5 Recirculation is required based upon new information arising under CEQA if, after public notice of availability for the Draft EIR, any of the following conditions occur:

- substantial new environmental impacts are identified,
- a substantial increase in the severity of identified impacts occurs, or;
- new feasible alternatives or mitigation measures are identified that would substantially reduce the severity of identified impacts but the lead agency declines to adopt such mitigation (State CEQA Guidelines Section 15088.5).

NEPA contains a similar standard that requires preparation of a supplemental EIS after preparation of a draft or final EIS if the lead agency identifies substantial changes, information, or circumstances related to the proposed action's effect on the environment (40 CFR section 1502.9[c][1]). NEPA narrows the definition of the environment to exclude purely social or economic effects as discussed in the response to comment O1-3 (40 CFR Section 1508.14).

The comments from the Reach Seven Property Owners are noted. However these comments and the responses in this document identify no substantial new impacts, information, or circumstances related to the Proposed Action. In a similar fashion, the comment identifies no substantial increase in the severity of identified impacts, or feasible mitigation within the scope of NEPA and CEQA that USACE or SAFCA declines to adopt (see Response to Comment O1-3 regarding financial mitigation). Under these facts, there is no basis for recirculation of the Phase 3 DEIS/DEIR.

O1-6 This comment raises two issues. First, the commenter argues that the Proposed Action would "permanently degrade" the environment in the community of homes in Reach 7 of the Sacramento River east levee. Second, the comment argues that this effect should be mitigated through financial compensation. It is true that the Proposed Action would result in some permanent impacts, such as conversion of farmland; the scope of these impacts is discussed in the Phase 3 DEIS/DEIR. The Proposed Action would also result in temporary conversion of farmland at some borrow sites; however, these sites would be returned to agricultural production after shallow grading to remove borrow, or converted to managed marsh or grassland for habitat functions. The commenter provides no factual link between any permanent impacts associated with the Proposed Action and specific harm to the Reach 7 property owners that is amenable to analysis and mitigation under NEPA or CEQA. See Responses to Comments O1-1 through O1-5 for a review of the relevant planning framework, environmental impacts, and mitigation measures that USACE and SAFCA are committed to performing.

O2

GARDEN HIGHWAY COMMUNITY ASSOCIATION
2701 Del Paso Road #130-231
Sacramento, CA 94835

April 3, 2009

John Bassett, Director of Engineering
SAFCA
1007 7th Street, 7th Floor
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AND

Elizabeth Holland, Planning Division
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RE: Comments on ENVIRONMENTAL IMPACT STUDY NATOMAS LEVEE IMPROVEMENT PROGRAM PHASE 3; SAFCA'S REQUEST FOR 408 PERMISSION AND 404 PERMIT

SAFCA and US Army Corps of Engineers:

Garden Highway Community Association (GHCA) is an incorporated community association whose membership includes nearly all waterside and landside property owners along the Garden Highway in the area addressed in SAFCA's Natomas Levee Improvement Program (NLIP). The GHCA supports increased flood protection for the Natomas basin, as long as it is done in a fiscally responsible, environmentally conscious, and scientifically sound manner. At the same time, as most GHCA members live on or next to the NLIP, they have an enormous interest and concern in how this project is implemented.

Below is a list of comments and concerns regarding the Draft Environmental Impact Study (DDEIS) / Draft Environmental Impact Review (DDEIS) pertaining to SAFCA's Phase 3 of the NLIP and US Army Corps Permitting.

1. **Overall Vagueness:**

This DEIS is 484 pages, refers to numerous other documents of similar size and appears to have taken years to prepare. Many portions are unintelligible to the average property owner and, taken as a whole, certainly cannot be fully researched and understood in the timeframe required. As a result, the GHCA prefaces this comment letter by advising that there may be numerous additional issues requiring comment of which the GHCA is not currently cognizant. The GHCA has tried to use every relevant numbering (paging) system in the DEIS (.pdf file) to facilitate its comments.

O2-1

2. **No-Action Alternative:**

Paragraph 2.2.1.1 (page 2-10 in DEIS or 104 in .pdf) states:

> require removal within the Phase 3 Project footprint. Although Chapter 4.0, "Environmental Consequences and Mitigation Measures," discusses the impacts related to the No-Action Alternative, it is not appropriate in this EIS/EIR to propose mitigation measures for the No-Action Alternative because SAFCA as the project proponent, has no authority or jurisdiction over USACE's proposed guidelines, impacts, or timing or implementation of mitigation required to mitigate impacts as a result of implementation of such guidance. Mitigation implementation would be the responsibility of USACE and will be the subject of a future, separate environmental document prepared by USACE. Environmental permits and other regulatory approvals would also be required, which may include, California Fish and Game Code Section 1602 Streambed Alteration Agreement, Clean Water Act Section 401 permit, and/or Clean Water Act Section 404 permit.

O2-2

It appears that impact statements 4.6-b, 4.8-a, 4.8-b, 4.9-b, 4.9-f, 4.9-h, and 4.16-a (ES-15 to ES-39 in DEIS / pages 39 – 63 in .pdf) contradict each other regarding what would be impacted and what mitigation would be required under the 'No-Action' Alternative. It appears that either SAFCA is unaware of future impacts and therefore contends no mitigation is required, or SAFCA understands the impacts and believes no mitigation is feasible. The GHCA believes the 'No-Action' Alternative, based on current USACE standards, will result in significant and irreparable harm to the environment, with no feasible mitigation. This does not appear to be legally permissible under current environmental laws.

3. **Utility Disruption:** (Paragraph 4.17-b (page ES-41 in DEIS, p. 65 in .pdf)

One can only assume this non-quantified description is based on "accidental" disruption and not the intentional disconnection and/or disruption of service. The GHCA is unable to locate any provision in the DEIS where SAFCA addresses loss of utility services to property owners due to power pole relocation or otherwise. This vague and superficial description certainly gives members of the GHCA inadequate notice regarding issues potentially impacting their utilities, especially in light of the enormity of power outages in a community with no public gas and/or water supply, dependent solely upon electricity for all services. A detailed plan and schedule for planned disruption must be disclosed and studied before the work begins.

O2-3

4. **Habitat Conservation:** (Paragraph 2.3.3 (p. 2-18 in DEIS, p. 112 in .pdf) "Habitat Conservation Components")

> Compensatory habitat creation that would be implemented as part of the Phase 2 Project in advance of the Phase 3 Project includes the creation of approximately:
>
> - 310 acres of managed grasslands,
> - 29 acres of canals,
> - 28 acres of associated uplands, and
> - 50 acres of landside woodlands.
>
> Additionally, the following would be preserved as part of the Phase 2 Project in advance of the Phase 3 Project:
>
> - 19.5 acres of landside woodlands,
> - over 80 acres of field crops, and
> - approximately 175 acres of rice fields.

O2-4

The actual location of habitat created and/or preserved should be described with sufficient detail to enable individuals to visit the sites before, during and after the work in order to gauge the results. Moreover, one must question how Phase 2 work can be performed "in advance of Phase 3" when both phases may be ongoing simultaneously.

O2-4 Cont.

5. **Encroachments/Levee Prism:**

Paragraph 2.3.5 (page 2-23 in DEIS or page 117 in .pdf) "Additional Actions…" states:

and maintenance requirements. Should any of these existing encroachments be determined to reduce the integrity of the levee, increase flood risk unacceptably, or impede visibility or access to the waterside levee slope, the encroachments would need to be removed. Removal of some waterside slope encroachments may be required by the end of 2010 to ensure that the levee system meets Federal criteria for the 100-year level of protection. Along

O2-5

SAFCA has repeatedly advised members of the GHCA that the "adjacent" levee adopted by the NLIP "should" remove the waterside trees, landscaping, fencing, and other vegetation and improvements from the "levee prism." In other words, SAFCA believes implementation of the NLIP would spare these items from removal under even the most aggressive encroachment standards. Thus, the GHCA is concerned with the apparent unchanged position regarding encroachments as described in the current DEIS.

SAFCA has also advised the GHCA it has maps of approximately 30,000 encroachments and all associated easements on the waterside of the levee. Oddly, SAFCA has thus far refused to share this information with the GHCA and/or its individual members. Research has revealed some vague, inadequately mapped easements dating back to the early 1900's which appear to show little or no support for any planned encroachment removal.

O2-6

SAFCA also stated "on the record" that it is willing to grant "post-facto" permits for encroachments that do not endanger the levee. Unfortunately, because the property owners have no information as to what items SAFCA feels are permitted or not, the members of the GHCA are left to guess about the future of their properties.

The members of the GHCA are very concerned about which "encroachments" might require removal and with the various easements SAFCA and/or its partners will attempt to claim. SAFCA has promised to work with each property owner to discuss and resolve issues regarding alleged encroachments, but thus far has taken no such action. The Phase 2 construction is about to start, yet no affected property owners have been contacted regarding encroachment or easement plans. This not only impacts existing improvements, but future improvements. The uncertainty also creates resale problems and negatively affects property values.

O2-7

6. **Construction Standards:**

California Title 23 (Waters) Division 1, Chapter 1, Article 8, Paragraph 133 states:

These standards apply only to the construction, reconstruction, or repair of dwellings and associated improvements on the left bank waterward berm and waterward levee slope of the Sacramento River between levee miles 0.00 and 18.60, Unit 1, Reclamation District 1000. These standards supplement and, where in conflict with, supersede the standards in section 111

O2-8

through section 137. While these standards are not specifically for commercial construction, in general, the principles in this section will apply to commercial development. …

These rules were specifically designed to accommodate the unique characteristics of the Natomas (RD 1000) section of California levees. Although not discussed in this document, they are referenced and appear to be important to SAFCA's claim that the "adjacent setback levee" would move the "levee prism" further landside and significantly reduce the need to remove waterside improvements and vegetation.

O2-8 Cont.

The Central Valley Flood Protection Board (CVFPB) is currently initiating a major revision to Title 23, but the GHCA was unable to locate any revisions to this section based on the new levee prism. The GHCA feels that if SAFCA is confident its design will move the levee prism further "landside", it should advocate appropriate revisions to this section of the documents. The failure to do so causes the DEIS to fall into direct contradiction with the promises and assurances SAFCA has made to the GHCA, and results in further concern about the true intentions of SAFCA's mitigation promises. As SAFCA and CVFPB are "working together", the GHCA believes joint consensus and a final determination on these issues should be straightforward.

7. **24/7 Construction:** (Paragraph 2.3.7.1 (page 2-25 in DEIS or 119 in .pdf) "24/7 Construction of Cutoff Walls")

SAFCA contends Cutoff Walls, and perhaps additional aspects of the project, will require a 24/7 construction schedule - **highly invasive and disruptive to residents and property owners**. Various sections of the document provide explanation for this schedule but the GHCA feels an "engineering" explanation should be provided to support this schedule. SAFCA has built other Cutoff Walls without the need for 24/7 construction. Members of the GHCA should not be subjected to 24/7 construction simply because SAFCA is running behind schedule on what might be perceived as an overly ambitious project.

O2-9

SAFCA has offered to pay for hotels for residents subject to 24/7 construction while the construction is taking place within 500' of their residence. On the other hand, there is no explanation for the length of time that relocation might be necessary. Projects of this size usually encounter unanticipated delays, and there is a HUGE difference between a family or business being displaced for a few nights, versus several weeks. The GHCA proposes that SAFCA offer "relocation allowances" so individual homeowners can make their own decisions as to whether hotel relocation is in their best interest.

O2-10

The GHCA also challenges the 500' distance standard for relocation. As all GHCA members learned during the 2007-2008 "Bank Protection" project, construction work along the water and in the open expanses along the rural banks of the Sacramento River, construction sound and reverberation can and do travel for miles. 24/7 construction was periodically attempted during sections of that project with dismal impacts on the residents of Garden Highway. It is anticipated 24/7 construction during subsequent phases of the NLIP would have an exponentially adverse impact on property owners spanning many miles in all directions. Moreover, the use of trucks to get to and from the actual "construction" sites will expand the location of the impact far beyond the limited construction sites addressed by SAFCA.

O2-11

Lastly, when an DEIS concludes that an impact is "significant" and cannot be mitigated, CEQA requires that the certifying body (SAFCA) perform a balancing test - balancing the significance of the impact (damage to environment) to the benefits of the protected interests (people, property, etc.). The certifying body must also make "findings on the record" that a balancing test was performed and how the results were determined. The GHCA does not believe this requirement has been met with regard to 24/7 construction, and other important aspects of the NLIP. The GHCA also does not believe SAFCA has adequately investigated alternatives to 24/7 construction which cannot be summarily dismissed solely on account of additional cost.

O2-12

Furthermore, page 4.16-4 (page 351 in the .pdf) states:

> construction. With the exception of construction of the seepage cutoff walls (e.g., 24/7 construction), construction is not generally anticipated to be conducted after 8:00 p.m.; however, it is possible that occasional construction activities may be required during nighttime hours (except for borrow areas in the Airport Critical Zone), in which

The GHCA believes this "loop hole" is overbroad and could be interpreted as giving SAFCA the unfettered discretion to disregard all adopted construction restraints to obtain permission for the NLIP. Moreover, 8:00 p.m. is not a reasonable baseline. The GHCA believes any construction after 6:00 p.m. is highly disruptive, unnecessary and virtually assures disruption of the quiet enjoyment of all property owners within the construction zone and surrounding sound zones.

O2-13

The GHCA also feels the DEIS ignores both city and county (Sacramento and Sutter) noise ordinances. As such, the GHCA seeks an explanation as how SAFCA plans to deal with its violations of local noise ordinances.

O2-14

What is even more disconcerting is page 4.14-6 of the DEIS (page 335 in the .pdf) states:

> Sacramento County, and Sutter County. Although construction activity is expected to take place during daytime hours in Sacramento County, Sutter County, and the city of Sacramento, because of the need to complete levee improvements outside of the flood season and because of other environmental and engineering constraints on project schedule, it is possible that construction may need to be conducted on a 24-hours-per-day and 7-days-per-week (24/7) work schedule basis. Therefore, noise may be generated by construction equipment operating near homes during the more noise-sensitive early morning and nighttime hours (i.e., during hours that are not exempted by the applicable local ordinances in the City of Sacramento and Sacramento County) and could result in sleep disturbance at nearby residences.

O2-15

This is tantamount to SAFCA granting itself a "free pass" for 24/7 construction if it deems it necessary for any reason, without a supplemental EIR or public review. It does not appear Impact 14-4.a even contemplates 24/7 construction noise. In other words, SAFCA appears to be "reserving the right" to make up any construction schedule it deems fit, without regard to the environment impacts stemming from that decision. The GHCA was unable to locate this subject in any of the various "overviews" of the DEIS.

If SAFCA determines 24/7 construction is necessary, it will not only impact residents in the areas of construction, but also everyone who lives anywhere near the numerous "borrow areas" and haul routes involved. The GHCA does not believe the possibility of 24/7construction at borrow sites, constructions sites and along haul routes, has been contemplated in this DEIS. This would be a very significant factor with no feasible mitigation.

O2-16

8. **Bike Path:**

Even though SAFCA and other government agencies have advocated a proposed "bike path' along the new, adjacent levee, there is no mention of it in the DEIS. SAFCA still references a "gravel inspection road". The GHCA continues to propose that SAFCA design a "new" paved road and grant an easement to the Parks and Recreation Department for future development as a bike/walkway to for the greater good of the entire community. Members of the GHCA feel it would cost much less to build a bike path now, rather than later, and would provide a much safer area for recreational activities than the current Garden Hwy provides. O2-17

9. **CEQA - Insufficient Detail Regarding Foreseeable Activities:**

The DEIS fails to include the reasonably foreseeable consequences of the widening of the Levee - removal of heritage oaks in sensitive, forested habitat which fall within the footprint of the expanded levee. Because the DEIS fails to include the reasonably foreseeable consequences of the levee widening, it fails to examine the environmental affects of that widening. O2-18

10. **CEQA - Failure to Provide Information About Assumptions Used In DEIS:**

The DEIS bases many of its conclusions about the Project's environmental impacts on the assumption that levee widening will have no impact on habitat that falls within the expanded footprint. The DEIS fails to provide any meaningful information substantiating that assumption. The EIS is the primary means of achieving the Legislature's considered declaration that it is the policy of this state to "take all action necessary to protect, rehabilitate, and enhance the environmental quality of the state"... The EIS is also intended "to demonstrate to an apprehensive citizenry that the agency has, in fact, analyzed and considered the ecological implications of its actions." Laurel Heights Improvement Ass 'n v. Regents of the Univ. of California (1988) 47 Cal.3d 376, 392).

Since the public was not provided with the notice that they widening would encroach on additional habitat, the very interested public in this matter has been denied a meaningful opportunity to participate in CEQA's mandatory environmental review proceeding. (See, Mountain Lion Coalition v. CA Fish and Game Comm'n (1989) 214 Cal.App.3d 1043 1050-1051. O2-19

Inadequate information or explanation of the impact of the levee, widening on habitat precluded meaningful public review and an opportunity to comment on the environmental consequences of the proposed Project. California's high court has emphasized "public participation is an essential part of the CEQA process." Concerned Citizens of Costa Mesa v. 32nd District Agricultural Assoc. (1987) 42 Cal.3d 929, 935. "To facilitate CEQA's information role, the EIR must contain facts and analysis, not just the agency's bare conclusions or opinions. This requirement enables the decision-makers and the public to make an "independent, reasoned judgment" about a proposed project" ibid. The California Supreme Court has acknowledged that interested citizens hold a "privileged position" within the CEQA process "based on a belief that citizens can make important contributions to environmental protection and on notions of democratic decision making." Id. at p. 936.

11. CEQA - Failure to Adequately Describe All Components of The Project:

The DEIS fails to sufficiently describe all components of the Project. SAFCA has expanded the Project but failed to address or analyze the significant impacts of that expansion on sensitive habitats. O2-20

12. CEQA - Inadequate Mitigation Due Lack Of Funding

SAFCA has previously acknowledged it had inadequate State or Federal Funding to complete the Project, including completion of the mitigation measures. Because funding of the entire NLIP project is in question, SAFCA has no means of insuring that the mitigation measures will actually be implemented. Thus, the DEIS fails to comply with CEQA. O2-21

13. General Construction and Mitigation

The DEIS contains insufficient notice about construction schedule and plans, complaint procedures and logs, power pole plans, encroachment removal plans, mitigation locations, schedules and compliance. The DEIS fails to identify the "levee prism" as contemplated by the new, adjacent levee design proposed by SAFCA and fails to adequately address potential construction related damage to improvements and vegetation. The DEIS additionally fails to adequately address decreased highway safety stemming from the new design, increased rainwater and pollutant runoff, and well starvation issues. O2-22 O2-23 O2-24

14. Alternative Designs

SAFCA has failed to conduct a legitimate, unbiased study to determine the most economically and environmentally sound project design to bring the Natomas Basin up to the USACE 100 year flood protection standard. SAFCA has summarily dismissed feasible alternatives that would lead to region-wide solutions to the flooding potential in the Natomas Basin and surrounding communities. SAFCA has also failed to make a rationale, "good faith" effort at minimizing the height and footprint of the adjacent levee system, especially in light of the lower and inferior levee systems both upstream and adjacent to the NLIP. O2-25

15. Property Values

The DEIS, consistent with all prior SAFCA action related to the NLIP, wholly fails to address the impact of the Project on property values in the affected areas and has no funding mechanism in place to deal with the destruction of property values in and around the project that will ripen into eminent domain and inverse condemnation lawsuits. This exposure includes, but is not limited to, irreparable damage to property values which began when this project was first publically announced (at a time when real estate values were significantly higher than today), and will continue indefinitely into the future. The project has stalled and prevented sales, land improvements and retirement plans. This trend will increase exponentially when active construction begins. O2-26

Duo the lack of a funding mechanism, the taxpayers will be left to shoulder yet another wave of unanticipated and undisclosed cost overruns.

16. Damage to Businesses

The DEIS fails to address the impact of the project on the businesses that exist along and upon Garden Highway which thrive only because individuals seek the tranquility and peace of a rural, river atmosphere that is easily accessible, peaceful and enjoyable. Moreover, the DEIS has no funding mechanism for compensating these business owners for their losses, leaving the tax payers exposed to significant costs. O2-27

17. Hydrology

The hydrology reports postulated by SAFCA and its engineers conclude the improved levee system contemplated by the NLIP will not increase the flood risk to the waterside property owners within the NLIP. These reports are **explicitly based upon the assumption that other surrounding Reclamation Districts will NEVER improve their levees. This assumption is improper, flawed and not in concert with the current push by adjacent Districts to fortify their levees.** The threat of increased flood risk cannot be summarily dismissed and a funding mechanism must be included to deal with the financial impact of this impact. O2-28

Thank you for your time. We appreciate your consideration in reviewing our comments and hope for the best possible outcome for all involved.

Sincerely,

GARDEN HIGHWAY COMMUNITY ASSOCIATION

O2-1 See Response to Comment L3-12.

O2-2 It is unclear to what "contradictions" the commenter refers. The No-Action Alternative (which corresponds to the CEQA No Project Alternative) involves not implementing the project, so the requirement for CEQA and NEPA mitigation would not be triggered. As stated in Section 4.0.1, "Approach to the Environmental Analysis," in the Phase 3 DEIS/DEIR,

> Mitigation measures are not required for impacts identified under the No-Action Alternative because the approving agency (in this case, SAFCA) would not be required to obtain permits or agreements if the agency chose not to approve the project. Additionally, USACE would not issue permission, permits, or authorizations for the No-Action Alternative. For these reasons, mitigation measures are not provided for the No-Action Alternative in Sections 4.1 through 4.21. (USACE and SAFCA 2009:4.0-2)

See also Section 4.0.1.2, "Terminology Used to Describe Impacts," in the Phase 3 DEIS/DEIR, which details the various CEQA significance conclusions used throughout Chapter 4.0, "Environmental Consequences and Mitigation Measures," in the Phase 3 DEIS/DEIR, including the following conclusion: too speculative for meaningful consideration.

USACE and SAFCA agree with the commenter that the No-Action Alternative would have significant and unavoidable effects on a number of environmental resources if flooding were to occur. This concern underlies the purpose and need for the Proposed Action (see Section 1.4, "Project Purpose/Project Objectives and Need for Action," in the Phase 3 DEIS/DEIR).

O2-3 Potential disruption of utility service is described in Impact 4.17-b, "Potential Disruption of Utility Service," in the Phase 3 DEIS/DEIR. Mitigation Measure 4.17-b, "Verify Utility Locations, Coordinate with Utility Providers, Prepare and Implement a Response Plan, and Conduct Worker Training with Respect to Accidental Utility Damage," in the Phase 3 DEIS/DEIR requires that "(u)tility relocations shall be staged to minimize interruptions in service," and that "(n)otification of any potential interruptions in service shall be provided to the appropriate agencies and affected landowners."

In addition, this mitigation measure requires use of the Underground Services Alert to locate any underground utilities, and preparation of a response plan to address accidental damage to utilities. Specifically, the response plan would include:

- chain of command rules for notification of authorities,
- appropriate actions and responsibilities to ensure the safety of the public and workers,
- worker education training conducted by the contractor, and
- implementation of the response plan by SAFCA and its contractors.

As described in Appendix H of the Phase 3 DEIS/DEIR, "Notifications of work schedule would be made by SAFCA in accordance with the terms of their Settlement Agreement with the Garden Highway Homeowners Association." The terms of SAFCA's Settlement Agreement with the Garden Highway Homeowners Association (Appendix G of the Phase 3 DEIS/DEIR), paragraph

8 states that, "… SAFCA will post a '60-day notice' of Planned Construction on the SAFCA website. A hard copy of the '60-day notice' shall be mailed to the GHCA contact person." In addition, during construction activities SAFCA would prepare a regularly updated summary of upcoming construction activities for posting on the SAFCA website. This would include the location and type of construction activities, anticipated road closures, and areas that would be on a 24/7 construction schedule.

O2-4 SAFCA and the other public agencies that hold these sites in trust for the public (such as TNBC) are responsible for ensuring the success of the creation and preservation of NLIP habitat conservation sites. This information will be the responsibility of the entity that takes ownership of the property and any request for this information will be at their discretion. The Phase 2 Project conservation components are expected to be constructed in winter 2009. The Phase 3 Project conservation components are still in the planning and design process and a date for construction has not yet been determined, but these components would likely be constructed in 2010.

O2-5 As described in Section 2.3.5, "Additional Actions to Meet FEMA, USACE, and State Design Requirements: Encroachment Management," of the Phase 3 DEIS/DEIR, the adjacent setback levee proposed as part of the Phase 3 Project would be designed to significantly reduce conflicts between waterside encroachments and applicable USACE levee operation and maintenance requirements. However, the full extent of this reduction cannot be known until the proposed levee improvements are completed, and USACE, the State, SAFCA, and RD 1000 have inspected and evaluated whether there are any encroachments that affect the integrity of the levee. Section 1.4.2.1, "Encroachment," in the Phase 3 DEIS/DEIR has been revised to reflect the fact that removal of encroachments that could be identified as threatening levee integrity would be subject to future environmental review. See Chapter 4.0, "Revisions to the DEIS/DEIR," of this FEIR for the text revision.

O2-6 See Response to Comment O2-5.

O2-7 See Response to Comment O2-5.

O2-8 Comment noted; as described in Section 1.7.2.2, "State Responsible and Trustee Agencies," in the Phase 3 DEIS/DEIR, CVFPB is a state responsible agency under CEQA for the Phase 3 Project, and therefore is acknowledged by SAFCA to have discretionary approval over certification of the Phase 3 DEIS/DEIR (State CEQA Guidelines Section 15381). See also Response to Comment O2-5.

O2-9 See Master Response: 24/7 Cutoff Wall Construction.

O2-10 See Master Response: 24/7 Cutoff Wall Construction.

O2-11 As stated under Mitigation Measure 4.14-a, "Implement Noise-Reducing Construction Practices, Prepare a Noise Control Plan, and Monitor and Record Construction Noise Near Sensitive Receptors," the 500-foot relocation standard is based on the 60-dBA contour of the loudest anticipated construction activity other than pile driving. Noise resulting from 24/7 construction activities is described under Impact 4.14-a, "Generation of Temporary, Short-Term Construction Noise," and is mitigated to the extent feasible under Mitigation Measure 4.14-a. Noise resulting from material hauling is discussed under Impact 4.14-c, "Temporary, Short-term Exposure of Residents to Increased Traffic Noise Levels from Hauling Activity," and is mitigated to the extent feasible under Mitigation Measure 4.14-c, "Implement Noise-Reduction Measures to Reduce the Temporary, Short-term Impacts of Haul Truck Traffic Noise." See also Master Response: 24/7 Cutoff Wall Construction.

O2-12 The SAFCA Board will adopt written findings for each significant environmental impact identified in the Phase 3 DEIS/DEIR (State CEQA Guidelines Sections 15091 and 15096[h]) prior to approving the Phase 3 Project. If the Board concludes that certain impacts will remain significant and unavoidable, the findings must contain a statement of overriding considerations, in which the SAFCA Board must find, prior to approving the project, that the benefits of the project outweigh its unavoidable adverse environmental effects (State CEQA Guidelines Sections 15092 and 15096[h]). The statement of overriding considerations must include specific social, economic, legal, technological or other benefits of the project that outweigh the significant effects on the environment, and must be based on substantial evidence in the FEIR and the record.

See also Master Response: 24/7 Cutoff Wall Construction.

O2-13 The comment states that construction after 8:00 p.m. is highly disruptive. While this comment references a statement in the "Visual Resources" section of the Phase 3 DEIS/DEIR, it should be reiterated that construction noise in Sacramento County is exempt from all noise standards between 6:00 a.m. and 8:00 p.m. Monday through Friday, and between the hours of 7:00 a.m. and 8:00 p.m. on Saturday and Sunday (Chapter 6.68 Noise Control, County of Sacramento Code). See also Master Response: 24/7 Cutoff Wall Construction.

O2-14 Both Sacramento and Sutter County noise ordinances are described in the Phase 3 DEIS/DEIR (USACE and SAFCA 2009:4.14-2 and 4.14-3). The conclusion of Impact 4.14-a, "Generation of Temporary, Short-Term Construction Noise," states that the Phase 3 Project would violate noise standards in the project area including applicable noise ordinances. Mitigation Measure 4.14-a, "Implement Noise-Reducing Construction Practices, Prepare a Noise Control Plan, and Monitor and Record Construction Noise Near Sensitive Receptors," includes all feasible noise reduction measures including barriers over stationary equipment, restriction of earth-moving construction activities to within exempted hours under applicable noise ordinances, and compensation to adjacent residences for off-site accommodations when noise standards cannot be met. See Mitigation Measure 4.14-a, "Implement Noise-Reducing Construction Practices, Prepare a Noise Control Plan, and Monitor and Record Construction Noise Near Sensitive Receptors," for a complete list of noise control measures. SAFCA will comply with all mitigation measures identified in the Phase 3 DEIS/DEIR to ensure that noise resulting from construction activities would be reduced to the extent feasible or occur during exempted hours. See also Master Response: 24/7 Cutoff Wall Construction.

O2-15 See Master Response: 24/7 Cutoff Wall Construction.

O2-16 Material hauling and borrow site excavation is not expected to occur outside exempted hours and therefore would not expose sensitive receptors along haul routes and borrow sites to excess noise levels. See also Master Response: 24/7 Cutoff Wall Construction.

O2-17 Construction of a bike path along the adjacent setback levee is not part of the Phase 3 Project as proposed by SAFCA; however, a bike path sponsored by Sacramento County, Sutter County, and the City of Sacramento is contemplated as part of the Phase 4b Project. See also Response to Comment L5-5.

O2-18 Impact 4.8-a, "Loss of Woodland Habitats," in the Phase 3 DEIS/DEIR assesses the potential impacts of all levee widening activities on all oak woodlands in the project area. In addition, it provides mitigation components that would result in a net gain of 34 acres of woodlands from the NLIP Phase 2 and 3 Projects. Section 2.3.3, "Habitat Conservation Components," in the Phase 3 DEIS/DEIR provides additional details on the specifics of the woodland conservation components of the Phase 3 Project.

The woodlands that would be removed as part of the Phase 3 Project do not occur within the jurisdictional boundaries subject to the Sacramento County Tree Preservation Ordinance (Chapter 19.12, Sacramento County Code 408 Section 1, 1981); therefore, the removal of these trees, which includes native oak trees, would not require a permit from Sacramento County (Stackhouse, pers. comm., 2009). However, these woodlands are subject to Sacramento County General Plan policies for native and landmark tree protection (Sacramento County 1993). The project's proposed conservation strategy for planting and preserving woodland groves and corridors would comply with the County General Plan policies regarding replacing woodlands, because the Phase 3 Project would include creating equivalent woodland habitat, monitoring of these areas to ensure success, and protecting the created and preserved woodlands in perpetuity, as under Impact 4.8-a, "Loss of Woodland Habitats," in the Phase 3 DEIS/DEIR.

O2-19 The comment does not provide a specific instance in which the Phase 3 DEIS/DEIR based conclusions on the assumption that levee widening would not have an impact on habitat that falls within the expanded footprint. The following impacts to habitat within the footprint under the proposed action alternatives are evaluated in Sections 4.7 through 4.9 of the Phase 3 DEIS/DEIR, and mitigation measures have been proposed to reduce the impacts:

- Impact 4.7-a: Impacts on Jurisdictional Waters of the United States
- Impact 4.8-a: Loss of Woodland Habitats
- Impact 4.8-b: Impacts on Wildlife Corridors
- Impact 4.9-a: Impacts on Special-Status Plant Species
- Impact 4.9-b: Impacts on Valley Elderberry Longhorn Beetle
- Impact 4.9-c: Impacts on Giant Garter Snake Related to Construction Activities
- Impact 4.9-e: Impacts on Northwestern Pond Turtle
- Impact 4.9-f: Impacts on Swainson's Hawk and Other Special-Status Birds
- Impact 4.9-g: Impacts on Burrowing Owl
- Impact 4.9-h: Impacts on Successful Implementation of the NBHCP

It should be noted that SAFCA anticipated the impacts to habitat that would occur as a result of the proposed levee and canal improvements and created a habitat development and management plan to compensate for effects on existing habitat that would result from these improvements. This plan was first introduced at a program level in the Phase 2 EIR (SAFCA 2007b). In the Phase 3 DEIS/DEIR, Tables 4.8-2, 4.9-1, 4.9-2, 4.9-3, and 4.9-4 quantify lost, created, and net temporary and permanent habitat effects for covered habitats and special-status species under the various alternatives analyzed.

O2-20 The comment is not specific about how the Phase 3 DEIS/DEIR has not sufficiently described all components of the project or analyzed the specific impacts of that expansion on sensitive habitats. See Response to Comment O2-19.

O2-21 SAFCA anticipates funding for project construction, implementation of mitigation measures, monitoring, and long-term management will be provided through SAFCA's CCAD and existing Operations and Management District for SAFCA's long-term obligations. If the Phase 3 Project is not funded and implemented, however, mitigation measures for the Phase 3 Project would not be required. See also Response to Comment L3-9.

O2-22 The Phase 3 DEIS/EIR contains the following three mitigation measures addressing construction plans and notification of residents.

- Mitigation Measure 4.2-c: Notify Residents and Businesses of Project Construction and Road Closure Schedule;

- Mitigation Measure 4.12-a, "Prepare and Implement a Traffic Safety and Control Plan for Construction-Related Truck Trips," and

- Mitigation Measure 4.12-c, "Notify Emergency Service Providers about Project Construction and Maintain Emergency Access or Coordinate Detours with Providers."

Mitigation Measure 4.2-c(a) states: "SAFCA shall provide residents and business owners located adjacent to the construction areas with a construction timeline and shall post its construction schedule on the SAFCA Web site. Information shall include road closures and detour information. The schedule shall be updated on a monthly basis." Additionally, Mitigation Measure 4.2-c has been revised to ensure that construction notification will comply with the provisions of the Garden Highway Settlement Agreement dated April 18, 2008 (included as Appendix G of the Phase 3 DEIS/DEIR).

O2-23 See Master Response: Sacramento River East Levee Prism.

O2-24 The proposed adjacent setback levee is not a new highway, would not alter the current configuration of the existing Garden Highway, and would not introduce new uses of the highway that might be incompatible with current usage. Temporary impacts on traffic safety as a result of construction are addressed in Impact 4.12-b, "Temporary Increase in Traffic Hazards on Local Roadways," in the Phase 3 DEIS/DEIR. Impact 4.5-b, "Impacts to Sacramento River Water Quality from Stormwater runoff from Garden Highway Drainage Outlets," addresses impacts to water quality that would result from the new waterside drainage system that would be required with the proposed adjacent setback levee. Impact 4.4-c, "Effects on Groundwater," addresses the potential effects of the project on groundwater wells.

O2-25 See Responses to Comments L3-8 and I10-3 regarding regional flood risk reduction solutions. See also SAFCA's Plan Formulation Report (SAFCA 2009b), which was required to be prepared by SAFCA as part of its state grant application to obtain funding from the California Department of Water Resources (under Proposition 1E). The Plan Formulation Report contains a detailed alternatives analysis that describes the analytical approach that was used to identify measures to address the project purpose and need and to incorporate these measures into the project. The SAFCA Board of Directors approved the Plan Formulation Report in February 2009.

O2-26 Effects analyzed under CEQA must be related to a physical change in the environment (State CEQA Guidelines Section 15358[b]). Economic and social effects are not considered environmental effects under CEQA. These effects need to be considered in an EIR only if they would lead to an environmental effect. Therefore, the project's impact on property values is beyond the scope of the CEQA analysis.

O2-27 Comment noted; Impact 4.2-c, "Potential to Physically Divide or Disrupt an Established Community" in the Phase 3 DEIS/EIR has been revised (see Chapter 4.0, "Revisions to the DEIS/DEIR," of this FEIR for the text revision). See also Response to Comment O2-26.

O2-28 The commenter has incorrectly stated that the Phase 3 Project hydraulic impact conclusions regarding water side property owners are based on the assumption that other reclamation districts would not improve their levees. This issue was previously addressed in the Phase 2 FEIR, "Master Response 1: Hydraulic Impacts of the NLIP." In fact, the hydraulic impact analysis prepared by MBK Engineers (Appendix B1 of the Phase 3 DEIS/DEIR) assumes that levees in all segments of the SRFCP could be improved to the "USACE 1957 Design Profile," which defines the minimum levee heights in each segment of the SRFCP. Currently, sections of some levees in the system are below this design profile. For example, in the Sacramento River reaches directly across from the Natomas Basin, the west levee is below the 1957 design profile in several

locations. The modeling assumes these levee height deficiencies could be addressed. What the modeling does not assume is that non-urban reclamation districts, such as the district in the subbasin west of Natomas, would raise their levees to the more demanding urban flood protection standard that was adopted by the state legislature under the Central Valley Flood Protection Act. The Act recognized a dichotomy in the SRFCP. Therefore, it is reasonable for SAFCA's hydraulic modeling evaluation to assume that the levees protecting these non-urban areas could be raised to meet the minimum standards of the SRFCP but not the more demanding "200-year" urban protection standard that the NLIP is designed to meet.

O3

From: Walt Seifert [mailto:bikesaba@gmail.com]
Sent: Monday, April 06, 2009 2:52 PM
To: Bassett. John (MSA)
Subject: FW: Natomas Levee Improvement Program (NLIP) Phase 3 Project EIR/EIS

Mr. Bassett,

I had your e-mail address wrong, so I'm resending.

Walt Seifert

From: Walt Seifert [mailto:bikesaba@gmail.com]
Sent: Sunday, April 05, 2009 12:09 PM
To: John Bassett (bassett@sacounty.net)
Cc: 'Ed Cox'; 'Klinker. Dan (MSA)'; 'elizabeth.g.holland@usace.army.mil'
Subject: Natomas Levee Improvement Program (NLIP) Phase 3 Project EIR/EIS

John Bassett, Director of Engineering
SAFCA
1007 7th Street, 7th Floor
Sacramento, CA 95814

RE: Natomas Levee Improvement Program (NLIP) Phase 3 Project EIR/EIS

Dear Mr. Bassett:

Thank you for the opportunity to comment on the Draft EIR/EIS on the NLIP Phase 3 Project. We are especially concerned with impacts of the project's construction activities on bicycle transportation and recreation along Garden Highway (4.5 miles near the I-5 bridge) and along the Ueda Parkway (6.2 miles extending north from Garden Highway) and at the access points to these important bicycle routes. Therefore, we offer the following comments.

Section 3.3.12 Transportation and Circulation Affected Environment. This section should acknowledge that bicycle use for utilitarian transportation (e.g. commuting) occurs on both the Garden Highway in the Sacramento River project area and on the Ueda Parkway bike trail in the NEMDC project area. O3-1

Section 3.3.15 Recreation Affected Environment. This section should acknowledge that considerable recreational bicycle use occurs along the entire length of the Garden Highway. Also, recreational bicycle use of the Ueda Parkway bike trail is increasing as its recent improvements and expansions become more widely known. O3-2

Section 4.12 Transportation and Circulation Environmental Consequences and Mitigation Measures. This section should acknowledge the adverse impact of temporary closures of Garden Highway (8-12 weeks) and the Ueda Parkway bicycle trail (3 – 6 months) to bicycle use for transportation. A Bicycle Detour Plan for the Garden Highway, similar to the Bicycle Detour Plan called for as Mitigation Measure 4.15-a (regarding the recreation impacts of the Ueda Parkway trail closure), should be described. This plan should be developed in consultation with the Sacramento County and city of Sacramento bicycle coordinators and include adequate noticing to local bicycle interests, signage regarding detours and closure points, and warning signs to motorists to share roadways with bicyclists. O3-3

Section 4.15 Recreation Environmental Consequences and Mitigation Measures. We applaud Mitigation Measure 4.15.a which is intended to mitigate adverse impacts to bicycle use by the 3 - 6 month closure of the Ueda Parkway bicycle trail. This plan should include signage to warn potential users about the closure at major entrance points to the trail (e.g. at the Garden Highway entrance and at the junction with the American River Parkway bicycle trail). This mitigation measure should also include a Bicycle Detour Plan for the Garden Highway closures and single-lane control sections. O3-4

We believe additional bicycle-related mitigations for the air quality, traffic and circulation, recreation and aesthetic impacts are needed and appropriate. Bicycle mitigations include construction of bike paths on or alongside levees, alongside canals, more (or provisions for more) access points to bike paths, and improved directional signage.

Specific recommendations for mitigations for the NEMDC/Steelhead Creek levee are.

Use NEMDC levee work to make provisions for additional access points.
Access points to north and south ends of Natoma Way (at south end from Natoma Way to Gardenland Park access trail)
Access from Rosin Court
Access from North Market Blvd.
Add undercrossing of West El Camino Avenue Bridge
Make trail access to south side of West El Camino Avenue meet Caltrans Highway Design Manual standards. O3-5

Any bike paths that are disturbed by the project should be restored to pre-project conditions or better as far as pavement quality and smoothness.

The project may present an opportunity to replace non-standard gates and bollards at bike path access points and to build additional bike facilities in bicycle master plans. These opportunities should be explored with the city of Sacramento and Sacramento County. O3-6

SABA is an award-winning nonprofit organization with more than 1400 members. We represent bicyclists. Our aim is more and safer trips by bike. We are working for a future in which bicycling for everyday transportation is common because it is safe, convenient, and desirable. Bicycling is the healthiest, cleanest, cheapest, quietest, most energy efficient, and least congesting form of transportation.

Yours truly,

Walt Seifert
Executive Director

Cc: Ed Cox, City of Sacramento Alternate-Modes Coordinator
Dan Klinker, Sacramento County Bicycle Coordinator

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O3-1 Comment noted; Table 3.12-1in the Phase 3 DEIS/DEIR has been revised to note that bicycle use for utilitarian transportation (e.g., commuting) occurs on both Garden Highway and Ueda Parkway. See Chapter 4.0, "Revisions to the DEIS/DEIR," of this FEIR for the text revision.

O3-2 Comment noted; Section 3.3.15, "Recreation," in the Phase 3 DEIS/DEIR has been revised to acknowledge that recreational bicycle use occurs along the entire length of Garden Highway. See Chapter 4.0, "Revisions to the DEIS/DEIR," of this FEIR for the text revision.

O3-3 Comment noted; Mitigation Measure 4.15-a, "Prepare and Implement a Bicycle Detour Plan for Ueda Trail, Provide Construction Period Information on Recreational Facility Closures and Detours, Provide Detours for Bicycle Facilities, and Coordinate with Recreation Agencies to Allow Them to Repair Damage to Recreational Facilities," in the Phase 3 DEIS/DEIR has been modified to include all bike routes and trails that would be affected by project construction and hauling activities. See Chapter 4.0, "Revisions to the DEIS/DEIR," of this FEIR for the text revision.

O3-4 Mitigation Measure 4.15-a, "Prepare and Implement a Bicycle Detour Plan for Ueda Trail, Provide Construction Period Information on Recreational Facility Closures and Detours, Provide Detours for Bicycle Facilities, and Coordinate with Recreation Agencies to Allow Them to Repair Damage to Recreational Facilities," in the Phase 3 DEIS/DEIR has been revised to include a Bicycle Detour Plan for Garden Highway closures. Additional clarification regarding providing construction period information (signage) on recreational facility closures and detours has been added. See Chapter 4.0, "Revisions to the DEIS/DEIR," of this FEIR for the text revision.

O3-5 The mitigation proposed for a project must relate to the impacts caused by the project. Feasible measures to avoid or substantially reduce the project's significant environmental impacts have been provided in the Phase 3 DEIS/DEIR for air quality, traffic and circulation, recreation, and visual resources (among other issue areas). Additional enhancements to bicycle facilities are not measures that would avoid or substantially lessen significant environmental impacts of the project, but should be brought to the attention of the appropriate transportation agencies.

O3-6 Comment noted; see Response to Comment O3-5.

O4

From: Nick Avdis [mailto:navdis@loducalaw.com]
Sent: Monday, April 06, 2009 10:42 AM
To: Buer. Stein (MSA); Bassett. John (MSA); Daniel Roth
Subject: RE: Valley View Acres Comments

Good morning, attached is the final comment letter that was faxed this morning. There are no changes from the draft you received last week, other that this draft is signed by the board members of VVACA. Thanks ~ Nick

---

From: Buer. Stein (MSA) [mailto:buers@SacCounty.NET]
Sent: Friday, April 03, 2009 11:15 PM
To: Nick Avdis
Cc: Gilchrist. Holly; Washburn. Timothy (MSA); Bassett. John (MSA); Barbara Gualco; Jay Davis
Subject: RE: Valley View Acres Comments

Nick,

We appreciated the opportunity to meet with you and get a better understanding of your interests and concerns. Thanks for the draft; we will begin reviewing and working to address your community's concerns right away.

Stein M. Buer
Executive Director
Sacramento Area Flood Control Agency
1007 7th Street, 7th Floor
Sacramento, CA 95814
(916)874-7606
buers@saccounty.net

From: Nick Avdis [mailto:navdis@loducalaw.com]
Sent: Friday, April 03, 2009 3:26 PM
To: Buer. Stein (MSA)
Subject: Valley View Acres Comments

Stein, thanks again for taking the time to meet with me yesterday, I felt that the meeting was positive. In any event, I indicated that there was a forthcoming letter from the Valley View Acres Community Association, while a final draft has yet to be completed, as I am waiting for comments from a couple of my board members. I don't anticipate any major change, but I did want, in the spirit of cooperation, to provide you with a draft as soon as I could. Thank you. ~ Nick

Nicholas S. Avdis
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Roseville, CA 95661
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VALLEY VIEW ACRES COMMUNITY ASSOCIATION

April 6, 2009

Mr. John Bassett
Director of Engineering
SAFCA
1007 7th Street, 7th Floor
Sacramento, CA 95814

Re: Draft Environmental Impact Statement/Draft Environmental Impact Report (DEIS/DEIR) for the Natomas Levee Improvement Program (NLIP), Phase 3 Landside Improvements Project (Phase 3 Project)

Dear Mr. Bassett:

The Valley View Acres Community Association appreciates the opportunity to comment on the DEIS/DEIR. Valley View Acres (hereinafter, "VVA") is a long established, rural community in the City of Sacramento, located generally north of Del Paso Road, south and west of East Levee Road and east of Sorento Road. VVA is comprised of approximately 300 acres and 150 residences, with many of the residents having resided in the community for many years. VVA residents have been long accustomed to living with the threat of flooding, and have therefore been long-time supporters of flood control efforts of SAFCA and the U.S. Army Corps of Engineers. While generally supportive of the Phase 3 Project, however, residents of VVA must express their deep concerns with the failure of the DEIS/DEIR to address the VVA community at all in critical areas of the DEIS/DEIR. O4-1

Aside from our general criticism that the DEIR/DEIR is poorly written from the perspective of a lay person attempting to understand the nature, scope and character of potential impacts to his or her property and community; the document was dense, difficult to follow and difficult to understand. Our specific comments concern the impacts to groundwater and domestic wells in our community, as well as traffic impacts, noise, soils, and land use resulting from the proposed levee improvements. The specific impacts to our community must be addressed.

The residents of VVA provide the following comments:

Executive Summary ES.5 Project Background and Phasing

Prior to addressing specific subject issues within the DEIS/DEIR, we are somewhat confused over the precise scope of the Phase 3 Project being analyzed in the DEIS/DEIR. On the one hand, the document states in the Executive Summary and onward (e.g., pages ES-1, 1-7, 1-11, 1-18, 1-19) that the DEIS/DEIR analyzes the Phase 3 Project, and that the Phase 4 Project, which appears to enable the Natomas Basin to achieve 200-year level flood protection, will be evaluated in a separate EIS/EIR this year. We recognize that a program-level EIR, SAFCA's EIR on Local Funding Mechanisms for Comprehensive Flood Control Improvements for the Sacramento Area (Local Funding EIR), was prepared for Stages 1-4 of the Local Funding Project, and that this DEIS/DEIR is meant as a project-level EIR for the Phase 3 Project only. However, the DEIS/DEIR describes the proposed improvements in the Phase 3 Project as follows:

> "(1) design criteria used to certify levees as providing 100-year flood protection under regulations adopted by the Federal Engineering Management Association (FEMA),
> (2) design criteria used by USACE and the State for the levees comprising the American River Common Features Project, and
> (3) design "200-year" water surface elevations developed by SAFCA in cooperation with the State using hydraulic modeling data developed by USACE and the State as part of the Sacramento-San Joaquin River Basins Comprehensive Study." (DEIS/DEIR, pages ES-2,-3).

O4-2

What is confusing is that the DEIS/DEIR then describes Phases 1-4 of the NLIP Landside Improvements Project as constituting the "early implementation project," meeting a 200-year design water surface elevation for levees, also described above as part of the Phase 3 Project, but yet the "early implementation project," including the Phase 4 improvements needed to achieve 200-year flood protection, is the basis of the General Re-evaluation Report (GRR) that will require its own environmental document (DEIS/DEIR, page ES-3).

This confusion is enhanced further by SAFCA's own stated CEQA Objectives for the NLIP, which are as follows:

> "(1) provide at least a 100-year level of flood protection to the Natomas Basin as quickly as possible,

(2) provide "200-year" protection to the Basin over time, and
(3) avoid any substantial increase in expected annual damages as new development occurs in the Basin." (DEIS/DEIR, page ES-4).

Our questions are: (1) whether the Phase 3 Project includes 200-year protection, or whether that is part of the Phase 4 Project instead; and, (2) why, if the GRR includes the Phase 3 Project and the Phase 4 Project, and Phase 4 is going to be analyzed later this year, were not both Phase 3 and 4 studied in the same document at the same time? O4-2 Cont.

Without any further explanation, it would appear that SAFCA and the USACE have segmented the environmental review of the improvements needed to obtain 200-year flood protection between two separate environmental documents, one for Phase 3 and another for Phase 4.

Executive Summary ES.11 Areas of Controversy and Issues To Be Resolved

Page ES-13. While taking nothing away from the impacts on Garden Highway residents (DEIS/DEIR, page ES-13), the document does not consider impacts to an even longer established community, VVA. Construction related noise, traffic and emergency service impacts will be every bit as great for VVA residents as for Garden Highway residents. O4-3

Chapter 2.0 Alternatives

Page 2-23. While generally impacts to agricultural wells are described for area along the NEMDC west levee, no mention is made of domestic wells for the VVA area (all of the homes within VVA are served by domestic wells), as further evidenced by the lack of such information in Figure 8-1 of the Luhdorff + Scalmanini groundwater impact evaluation found in Appendix B2 of the DEIS/DEIR. O4-4

Page 2-26. In the section of the Traffic Control During and After Construction, no mention whatsoever is made of any impacts to East Levee Road and Sorento Road, upon which a number of VVA residents depend as their sole access point into and out of their homes. The DEIS/DEIR does not describe any such impacts to East Levee Road and Sorento Road. O4-5

Page 2-27. In the discussion of the Pleasant Grove Creek Canal West Levee, and particularly Plate 17b, the DEIS/DEIR states that the waterside slope may need to be O4-6

trimmed back, requiring "relocation of Natomas Road or by placing additional fill material on the waterside of the levee slope." If the document is a project-level document, why isn't this issue resolved, and then analyzed on the DEIS/DEIR?

In Section 2.3.7.4, also on page 2-27, the first paragraph of the section discusses Plate 17c showing the footprint for Phase 3 Project work on the NEMDC. However, Plate 17c does not show any take lines, so adjacent property owners do not know what the actual impacts will be on their properties and how much of their property will be taken. Again, if the document is a project-level document, why isn't this issue resolved, and then analyzed on the DEIS/DEIR? O4-6 Cont.

Page 2-28. We would note that our confusion stated above regarding the scope of the Phase 3 Project is compounded when the discussion of the RD 1000 Pumping Plan No. 2 describes raising pipes above the 200-year design water surface elevation. Again, we are unsure exactly which phase includes improvements to achieve that level of flood protection. O4-7

Page 2-31. In Section 2.3.8.4, it is not explained why the parcels in the Elkhorn Borrow Area are unknown, other than "the document performs project-level NEPA/ CEQA analysis to "extent feasible..." Why is it not feasible to identify them now as has been done in all other areas in the Natomas Basin? O4-8

Chapter 3.0 Affected Environment

Pages 3-2 to 3-5. The VVA community is not identified as an established community. O4-9

Page 3-7. VVA should be separately identified.

Page 3-10. The section on the City of Sacramento General Plan must be updated. On March 3, 2009, the Sacramento City Council adopted the General Plan 2006. O4-10

Page 3-54. In describing the Project Area Roadway Network, two major roadways vital to the VVA Community, Sorento Road and East Levee Road, are omitted. Why? In addition, it should be noted that Sorento Road is currently a substandard road that has been severely degraded from construction activities from the Twin Rivers East Natomas Educational Complex site. Sorento Road has yet to be repaired or replaced to a satisfactory condition. If residents who use East Levee Road to O4-11

access their homes must now use Sorento Road, Sorento Road must be determined to be a suitable roadway for any such uses. O4-11 Cont.

Chapter 4.1 – Agricultural Resources

Page 4.1-3. It does not appear evident from the DEIS/DEIR what are the impacts to agricultural resources in the VVA area from a wide NEMDC levee footprint, which footprint would permanently, not temporarily, reduce agricultural resources in this area of VVA and would have immediate impacts to current agricultural activities. O4-12

Chapter 4.2 Land Use, Socioeconomics, and Population and Housing

Page 4.2-4.5. Under both the Proposed Action and Levee Raise-in-Place Alternative, adverse impacts from disruption to an established community, VVA, are neither described nor analyzed. The impacts to VVA from noise, traffic, emergency services and groundwater must be addressed. O4-13

Chapter 4.3 Geology and Soils

Pages 4.3-2, -3. In the discussion on borrow sites, the text here references Table 2-2 as listing the borrow sites that would potentially be used for the Phase 3 Project. However, as noted above, page 2.31 of the DEIS/DEIR states that not all borrow sites are currently known and require further analysis. Which explanation is correct? If all borrow sites have not been analyzed, how is the severity of the impact known, and how can the conclusion of less than significant after mitigation be reached? O4-14

Chapter 4.4 Hydrology and Hydraulics

Page 4.4-14. Under Impact 4.4-c, Effects on Groundwater, a review of Appendix B2, by Luhdorff + Scalmanini (LSCE), shows that impacts of cutoff walls on wells in VVA cannot be known or described, because the LSCE report, as shown in Figure 8-1 thereto, shows no wells serving the VVA community at all. As mentioned above, all the homes within our community are served by domestic wells. O4-15

Chapter 4.6 Fisheries

Page 4.6-3. There is no discussion in the DEIS/DEIR regarding removal of O4-16

landside trees and vegetation in the VVA area due to the expanded levee footprint and what impact that may have on aquatic species. O4-16 Cont.

Chapter 4.12 Transportation and Circulation

Page 4.12-3. In the third full paragraph on the page under the Proposed Action, construction on the NEMDC west levee discusses use of "off-road haul routes from the East Side and Twin Rivers borrow sources," but fails to disclose or analyze impacts to East Levee Road, used as a primary access route by a number of VVA residents.

Under the Levee Raised-in-Place Alternative, the discussion at the bottom of the page attempts to differentiate Garden Highway from other local roads in the Natomas Basin, presumably including East Levee Road and Sorento Road, since supposedly only "Garden Highway is a primary route for residents traveling to and from their homes on the west side of the basin." (DEIS/DEIR, page 4.12-3). Impacts to VVA residents from impacts to East Levee Road and Sorento Road must be addressed. O4-17

Page 4.12-4. Because of the failure, just noted above, to analyze the impacts to East Levee Road and Sorento Road and to the VVA community, Mitigation Measure 4.12-a fails to mitigate any such impacts to East Levee Road and Sorento Road. O4-18

Pages 4.12-5, -6. The DEIS/DEIR continues to compound this legal deficiency in its description of Impact 4.12-b, as again, East Levee Road and Sorento Road are not analyzed for impacts from temporary increases in traffic hazards to local roadways. O4-19

Page 4.12-7. The focus solely on Garden Highway as a Natomas Basin roadway providing ingress and egress to residents, discussed in Impact 4.12-a, is further compounded in the critical area of Impact 4.12-c, Temporary Disruption of Emergency Service Response Times and Access, both under the Proposed Action and Levee Raise-in-Place Alternative, for the failure to address whether there are any impact to East Levee Road and Sorento Road. O4-20

Chapter 4.14 Noise

Page 4.14-7. Under Mitigation Measure 4.14-a, the DEIS/DEIR places the onus on residents experiencing construction noise impacts to go to hotels for stays and seek reimbursement from SAFCA. Such a proposal is placing the financial burden of the upfront cost on the victim. The mitigation measure should provide for payment by O4-21

SAFCA directly to hotels, and reimbursement of meals, while residents have to be away from their impacted homes. O4-21 Cont.

Page 4.14-11. Under Mitigation Measure 4.14-c, if haul truck noise levels exceed allowable nighttime levels, then residents should receive the same treatment for hotel stays and meals as under construction noise impacts. The effect of the impact is the same, nighttime disturbance from noise levels in excess of adopted standards. The mitigation should also be the same. O4-22

Chapter 4.17 Utilities and Service Systems

Page 4.17-3. Under Mitigation Measure 4.17-a, how does SAFCA propose to compensate residents "in kind" for impacts to their wells during construction? O4-23

Chapter 4.18 Hazards and Hazardous Materials

Page 4.18-7. How precisely are residents who live off of East Levee Road to be evacuated in the case of an emergency if East Levee Road or Sorento Road is blocked? O4-24

Chapter 5.0 Cumulative and Growth-Inducing Impacts, and Other Statutory Requirements

Pages 5-4, 5-8, 5-10, 5-12. Given the failure to address impacts to the VVA community, particularly in the areas of impacts to wells and traffic, the conclusion of less than cumulatively considerable for these areas cannot be maintained in the DEIS/DEIR, including on page 5-10, and must instead be treated as cumulatively considerable, and should be added to such impacts listed on pages 5-8 and 5-12. O4-25

Page 5-21. Again, the LSCE report failed to address impacts to the VVA community's domestic wells, as they are omitted in Figure 8-1 of the LSCE.

Conclusion

The Valley View Acres Community welcomes the opportunity to have enhanced flood protection in the Natomas Basin, and have, in fact, long supported such efforts, including the payment of assessments on their properties and the affirmative voting of additional assessments to fund the propose levee improvements. However, when an environmental document fails to examine serious and potentially significant impacts to O4-26

our long-established community and our rural way of life, we as residents must demand that the impacts to the residents of Valley View Acres be adequately addressed.

O4-26
Cont.

Respectfully Submitted on Behalf of
the Residents of Valley View Acres

Nick Avdis, President

Shannon Summers, Vice President

Angela Angel, Secretary

Joe Angel, Board Member

Diana Brace, Board Member

Libby Harmor, Board Member

Richard Garrison, Board Member

Tony Trujillo, Board Member

Dolores Santos

Dolores Santos, Board member

Valley View Acres Community Association

O4-1 See Responses to Comments O4-2 through O4-26.

O4-2 See Response to Comment F2-4 for clarification of 100-year compared to "200-year" improvements provided by which project phases and by whom (i.e., USACE or SAFCA). To move forward as quickly as possible to reduce the risk of flooding in the Natomas Basin, the NLIP is being carried out in phases (including detailed design, NEPA and CEQA environmental compliance, permitting, and construction). Each of the NLIP project phases has its own independent utility, can be accomplished with or without the other project phases, and provides additional flood risk reduction benefits to the Natomas Basin whether implemented individually or collectively. See also Section 1.3, "Project History and Planning Context," in the Phase 3 DEIS/DEIR, which further explains the rationale for project phasing.

O4-3 See Response to Comment O4-13.

O4-4 See Master Response: Groundwater Hydrology in the Vicinity of the NEMDC.

O4-5 Sections of East Levee Road would require closure during project construction. Except for the intersection with East Levee Road, Sorento Road would remain open during construction. See Chapter 4.0, "Revisions to the DEIS/DEIR," of this FEIR for text revision.

O4-6 The potential impacts of water side work on the PGCC, should it be required, are addressed in several places in the Phase 3 DEIS/DEIR. Impact 4.5-a, "Temporary Impacts on Water Quality from Stormwater Runoff, Erosion, or Spills," addresses degradation of water quality that could occur in the PGCC from any waterside work, including slope flattening. Impact 4.6-a, "Loss of Fish or Aquatic Habitat through Increased Sedimentation and Turbidity or Releases of Contaminants," addresses loss of fish habitat from degradation of water quality that could occur in the PGCC as a result of waterside construction. The water side slope flattening on the PGCC would occur above the waterline of the channel. Section 2.3.7.3, "Pleasant Grove Creek Canal," in the Phase 3 DEIS/DEIR also notes that rock slope protection may be required on the water side slope to provide additional erosion control. Impact 4.7-a, "Impacts on Jurisdictional Waters of the United States," concludes that construction of this rock slope protection would result in less than 1.0 acre of fill within the PGCC channel below the ordinary high-water mark.

CEQA does not require that project-level analysis be based on final engineering design of a project but rather that an EIR disclose the significant environmental impacts of a proposed project at a reasonable level of detail (State CEQA Guidelines Section 15151). Plate 17c in the Phase 3 DEIS/DEIR provides a maximum footprint for levee construction on the NEMDC west levee. Table H-1 and Plate H-1d in the Phase 3 DEIS/DEIR identify the parcels that would be directly affected by the project footprint, and it is noted in Appendix H of the Phase 3 DEIS/DEIR that all or portions of these parcels may need to be acquired. As noted in Section 2.3.6, "Lands, Easements, Relocations, and Rights-of-Way," in the Phase 3 DEIS/DEIR, privately owned lands would be acquired in fee. Real property acquisition and relocation services would be accomplished in accordance with the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970, (42 USC 4601 *et seq.*) and implementing regulation, 49 CFR Part 24; and California Government Code Section 7267 *et seq.*

O4-7 See Responses to Comments F2-4 and O4-2.

O4-8 See Response to Comment O1-1.

O4-9 The intent of Chapter 3.0, "Affected Environment," in the Phase 3 DEIS/DEIR is to identify the major features located within the project area. Table 3-1 in the Phase 3 DEIS/DEIR identifies the major features located adjacent to the Sacramento River. The Valley View Acres Community has been added to Section 3.3.2.1, "Land Uses in the Project Area," in the Phase 3 DEIS/DEIR as an established community. See Chapter 4.0, "Revisions to the DEIS/DEIR," of this FEIR for the text revision.

O4-10 Under CEQA, the baseline for existing conditions is the date of issuance of the Notice of Preparation (State CEQA Guidelines Section 15126.2). However, Section 3.3.2.2, "Relevant Land Use Plans and Polices," in the Phase 3 DEIS/DEIR has been revised to clarify that at the time of writing the Phase 3 DEIS/DEIR, the *City of Sacramento General Plan 2030 Update* was still in the review process. See Chapter 4.0, "Revisions to the DEIS/DEIR," of this FEIR for the text revision.

O4-11 Table 3.12-1 in the Phase 3 DEIS/DEIR has been revised to include East Levee Road and Sorrento Road (see Chapter 4.0, "Revisions to the DEIS/DEIR," of this FEIR for the text revision). East Levee Road provides access to the Valley View Acres Community for only a few residences north of Barros Drive. Because Sorento Road is currently used by numerous Valley View Acres Community residents, it would be considered adequate to provide access for these residents during the estimated three months that the East Levee Road would be closed for levee repairs and improvements. Mitigation Measure 4.12-a, "Prepare and Implement a Traffic Safety and Control Plan for Construction-Related Truck Trips," in the Phase 3 DEIS/DEIR requires SAFCA to coordinate with Sacramento and Sutter Counties and the City of Sacramento to address maintenance and repair of affected roadways resulting from increased truck traffic. See also Response to Comment O4-17.

O4-12 The Phase 3 Project would result in the conversion of approximately 13 acres of Important Farmland (2 acres of Farmland of Local Importance and 11 acres of Grazing Land) along the NEMDC west levee toe, between Elkhorn Boulevard and the NEMDC Pumping Station, as a result of proposed widening of the NEMDC levee prism in this area. See Chapter 4.0, "Revisions to the DEIS/DEIR," of this FEIR for the text revision.

The potential for conversions of Important Farmland resulting from the NLIP was previously analyzed in the Phase 2 EIR and Phase 2 EIS at a program level for the Phase 3 and 4 Projects. Based on preliminary project designs and estimates of land required for habitat creation and borrow needs, the Phase 2 EIR included an estimate of Important Farmland conversion resulting from the Phase 3 and 4 Projects: approximately 340 acres for flood risk reduction improvements and 125 acres for woodland plantings, for a total of 465 acres (SAFCA 2007b:3.2-13). In a similar fashion, the Phase 2 EIS concluded that approximately 255 acres would be converted by improvements to flood risk reduction infrastructure and woodland plantings and 125 additional acres from improvements to drainage infrastructure and canals, for a total of 380 acres (USACE 2008:4-3). These acreages are program-level estimates based on the scope, range, and potential variation of NLIP activities known at the time the above documents were prepared. Both the Phase 2 EIR and Phase 2 EIS identified significant and unavoidable impacts based upon the potential permanent conversion of Important Farmland.

Impact 4.1-a, "Conversion of Important Farmland to Nonagricultural Uses," in the Phase 3 DEIS/DEIR concluded that permanent conversion of Important Farmland under the Proposed

Action would amount to approximately 362 acres, which is similar to the program level estimate. Under the Levee Raise-in-Place Alternative, the conversion would be 453 acres, which is greater than the program-level estimate, primarily because of the increased area needed to compensate for waterside woodland impacts. With the additional 13 acres of impacts to Important Farmlands along the NEMDC west levee, the total permanent conversion of Important Farmland for the Phase 3 Project would be approximately 375 acres for the Proposed Action and 466 acres for the Levee Raise-in-Place Alternative. This additional conversion would not be substantially greater than the acreage identified in the Phase 3 DEIS/DEIR and, thus, would not alter the conclusions in the Phase 3 DEIS/DEIR. The impact would remain significant and unavoidable.

O4-13 See Responses to Comments O4-11, O4-17, and O4-18 regarding access, emergency services, and traffic issues. See Response to Comment O4-4 regarding groundwater impacts. Impact 4.14-a, "Generation of Temporary, Short-Term Construction Noise," in the Phase 3 DEIS/DEIR notes that noise-sensitive land uses are scattered throughout the areas in which construction would occur, but that the greatest concentration of noise-sensitive land uses along the NEMDC west levee are in the area south of the proposed Twin Rivers Unified School District borrow site. This is the area in which the Valley View Acres Community is located; therefore, noise impacts that would affect residents in this community were addressed in the Phase 3 DEIS/DEIR.

O4-14 See Response to Comment O1-1.

O4-15 See Master Response: Groundwater Hydrology in the Vicinity of the NEMDC.

O4-16 Removal of land side trees and vegetation would not be expected to affect the aquatic giant garter snake. Potential impacts to giant garter snake are fully addressed in the Phase 3 DEIS/DEIR in Section 4.9, "Special-Status Terrestrial Species," under Impact 4.9-c, "Impacts on Giant Garter Snake Related to Project Construction Activities."

O4-17 Impact 4.12-b, "Temporary Increase in Traffic Hazards on Local Roadways," in the Phase 3 DEIS/DEIR has been revised to reflect the potential for increased use of roads in the vicinity of NEMDC construction, including Sorento Road, as a result of the three-month closure of East Levee Road during construction. See Chapter 4.0, "Revisions to the DEIS/DEIR," of this FEIR for the text revision.

Impact 4.12-c, "Temporary Disruption of Emergency Service Response Times and Access," in the Phase 3 DEIS/DEIR has been revised to note that the three-month closure of East Levee Road could interfere with emergency access to adjacent residences. See Chapter 4.0, "Revisions to the DEIS/DEIR," of this FEIR for the text revision.

O4-18 See Response to Comment O4-17. As noted in Section 4.1 of Appendix H in the Phase 3 DEIS/DEIR, following completion of the cutoff wall in the NEMDC west levee, the levee crown would be reconstructed and East Levee Road would be restored to gravel roadway or asphalt pavement, depending upon the existing road surface. Mitigation Measure 4.12-a, "Prepare and Implement a Traffic Safety and Control Plan for Construction-Related Truck Trips," in the Phase 3 DEIS/DEIR would apply to any roadway affected by project construction.

O4-19 See Response to Comment O4-17.

O4-20 See Response to Comment O4-17.

O4-21 The conditions set forth in Mitigation Measure 4.14-a, " Implement Noise-Reducing Construction Practices, Prepare a Noise Control Plan, and Monitor and Record Construction Noise Near Sensitive Receptors," in the Phase 3 DEIS/DEIR are intended to minimize nighttime noise effects

on residents located within 500 feet of 24/7 construction activities. This mitigation measure is intended to decrease impacts to noise-sensitive receptors.

SAFCA is a public agency that would provide affected residents reimbursement of local hotels or short-term rental stays. SAFCA must ensure that public funds are used in accordance with their respective budgeted uses. To provide this assurance, proof of stay in the form of necessary paperwork and a request for reimbursement must be submitted to justify allocation of funds.

Further, this service is provided to residents who would maintain access to their homes 24 hours per day. Normal activities, such as preparation of food, would not be inhibited by this construction; thus, reimbursement for meals would not be necessary.

O4-22 See Response to Comment O2-16.

O4-23 In Mitigation Measure 4.17-a, "Coordinate with Irrigation Water Supply Users Before and During All Irrigation Infrastructure Modifications and Minimize Interruptions of Supply," in the Phase 3 DEIS/DEIR, SAFCA considers "in kind" to mean that an alternative source of irrigation water would be provided. Specifically, SAFCA would provide surface or groundwater supplies to replace any deficit to irrigation water occurring as a result of project implementation. This would reduce the potential for temporary disruptions of irrigation water supply. See also Master Response: Groundwater Hydrology in the Vicinity of the NEMDC.

O4-24 To implement the Phase 3 Project, SAFCA would be required to implement traffic safety and control plans for local roadways (Mitigation Measure 4.12-a, "Prepare and Implement a Traffic Safety and Control Plan for Construction-Related Truck Trips") and maintain emergency access (Mitigation Measure 4.12-c, "Notify Emergency Service Providers about Project Construction and Maintain Emergency Access or Coordinate Detours with Providers"). Traffic control plans will be prepared as part of the preconstruction planning.

O4-25 As discussed in Section 5.1.7, "Cumulative Impact Analysis: Project Impacts that Would Not be Cumulatively Considerable," in the Phase 3 DEIS/DEIR, impacts to traffic and hydrology would not be considered cumulatively considerable because related impacts would not be added to the impacts of other projects. See Response to Comment O4-11 and Master Response: Groundwater Hydrology in the Vicinity of the NEMDC.

O4-26 See Responses to Comments O4-1 through O4-25.

O5

ASSOCIATION FOR THE ENVIRONMENTAL PRESERVATION OF THE GARDEN HIGHWAY, a community association
6301 Garden Highway
Sacramento, CA 95837

April 2, 2009

Elizabeth Holland, Planning Division
U.S. Army Corps of Engineers
1325 J Street Room 1480
Sacramento, CA. 95814

John Bassett, Director of Engineering
SAFCA
1007 7th Street, 7th Floor
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RE: Comments on:

DRAFT EIS/EIR FOR
NATOMAS LEVEE IMPROVEMENT PROGRAM
PHASE 3 LANDSIDE IMPROVEMENTS
REQUEST FOR 408 PERMISSION AND 404 PERMIT

Dear SAFCA and Corps of Engineers:

The *Association for the Environmental Preservation of the Garden Highway* (AEPGH) is a community association whose membership includes all waterside and landside property owners along the Garden Highway in the area addressed in SAFCA's Natomas Levee Improvement Program. (NLIP.) We list below our comments and concerns regarding the Draft Environmental Impact Report (DEIR) issued by SAFCA and the associated Draft Environmental Impact Statement (DEIS) issued by the Corps on February 13, 2009, pertaining to SAFCA's NLIP, Phase 3. O5-1

As a prelude to the comments below, AEPGH feels that it is necessary to express one overriding concern about a SAFCA policy which appears to be the root of the many important deficiencies present in the decisions and plans presented in the combined DEIS/DEIR for Phase 3 (and in all of the NLIP phases). On numerous occasions, SAFCA has stated that they will be able to complete the NLIP in some three or four years – whereas typically a project of this size takes ten to fifteen years. This contention may seem impressive until it is scrutinized. AEPGH suggests that SAFCA's ability to do a fifteen year project in three years is not based upon a fact that the SAFCA organization is five times smarter and more efficient than any other agency in the United States. Instead, AEPGH suggests that this incredible speed is based upon SAFCA's decision to ignore thoughtful, reasonable and proper design considerations and to ignore proper protection of the environment in favor of rapid completion of the project. Unfortunately, "Haste makes waste" is an appropriate axiom describing SAFCA's plans. O5-2

COMMENTS

I. ADOPTION OF EARLIER COMMENTS TO THE NLIP

AEPGH has reviewed and concurs with comments previously submitted to SAFCA and the Corps by the Garden Highway Community Association and others pertaining to Phase 2 of the NLIP. Since Phase 3 of the project presents, in most respects, many of the same plans, policies, and environmental analyses found in the Phase 2 DEIR, and since SAFCA and the Corps have not meaningfully addressed the comments found in the GHCA and other's comments, AEPGH attaches these Phase 2 comments and fully incorporates them by reference as part of AEPGH's comments to the Phase 3 DEIS/DEIR. This attached comments document refers to a letter document submitted to SAFCA by Kenyon/Yeates dated November 27, 2007, a letter document submitted to the State Reclamation Board by Kenyon/Yeates dated December 19, 2007, a letter document submitted to SAFCA by the U.S. Fish & Wildlife Service and the California Department of Fish and Game, and a letter document submitted by Kronick Moskovitz Tiedemann & Girard to SAFCA dated October 29, 2007. AEPGH incorporates by reference all of the contents of these letter documents as part of its comments to the Phase 3 DEIS/DEIR. Finally, the Kenyon/Yeates letters originally contained exhibits attached to the letters. SAFCA received these exhibits when the letters were originally submitted. Although these exhibits are not attached to this present comment letter, AEPGH fully adopts (incorporates by reference) all the exhibits originally submitted to SAFCA as part of the Kenyon/Yeates comments letters. Note that all of the documents listed above are public documents which are presently in your possession. O5-3

II. U.S. ARMY CORPS' FAILURE TO EVALUATE THE EFFECTS OF SAFCA'S PLAN CHANGES FOUND IN SAFCA'S SEIR FOR PHASE 2

Subsequent to the Corps issuance of permits and permissions pertaining to NLIP Phase 2, the SAFCA Board on January 29, 2009, certified a Supplemental EIR (SEIR) to SAFCA's plans for Phase 2 of the NLIP. This SEIR contained several changes to the plans for the Phase 2 of the NLIP – including:

a. Construction of cutoff walls in place of seepage berms for several areas between Reaches 1 through 4a along the Sacramento River east levee;
b. Cutoff wall construction on a 24-hours-per-day, 7-days-per-week basis; O5-4
c. A change in the baseline at the Sacramento International Airport north bufferlands from active rice cultivation to idle conditions;
d. Additional details regarding construction of new collection facilities for storm drainage to convey surface water beneath Garden Highway to the Sacramento River; and
e. The addition of 90 acres of foraging habitat that would be created or preserved by acquisition and reclamation of land used for borrow materials.

AEPGH has found no documentation showing that the Corps has addressed or even reviewed these changes to the Phase 2 plans – allowing a lapse in the review and consideration of a number of key considerations to the NLIP project. AEPGH contends that the Corps is required, pursuant to NEPA, to review all final plans of a project (or of any phase of a project) before permits and permissions can be issued by the Corps. Therefore, AEPGH requests the Corps to issue a stop work order to SAFCA for all work in the NLIP project until the Corps has completely reviewed and approved, via a SEIS, the final plans for the Phase 2 of the project.

O5-4 Cont'd

III. CONFLICT OF INTEREST

SAFCA staff, via the SAFCA Board, hired an environmental consultant, EDAW, to prepare its DEIR and FEIR for its Phase 2 and Phase 3 of the NLIP. Once EDAW finished its work in preparing the DEIR and FEIR for Phase 2 of the project, SAFCA staff asked the SAFCA Board to certify the FEIR prepared by EDAW. AEPGH contends that SAFCA Board's approval of EDAW's work was a conflict of interest – in that the same body that hired the consultant was allowed to approve the consultant's work. This is of especial concern since, to AEPGH's knowledge, not a single member of SAFCA's Board is a recognized expert in the fields of levee hydraulic design or environmental impact analysis. Indeed, to AEPGH's knowledge, no member of SAFCA's board even contends that they have special expertise in these areas. AEPGH contends that SAFCA Board's certification of the FEIR for Phase 2 was an uninformed act and not in keeping with the California Environmental Quality Act's intent.

As well, the DEIS for Phase 2 was prepared by EDAW, under the direction of SAFCA, for the Corps review. The intent pursuant to NEPA of the Corps preparation of an EIS for any project is, in part, to make certain that the significant negative environmental impacts of a project are properly avoided or mitigated – i.e., an independent review by the Corps. Using the same environmental consultant, directed by SAFCA, to prepare the document reviewed by the Corps is clearly not an independent review. It is highly unlikely that the EDAW staff preparing the Corps EIS would independently review (and reject, if necessary) the work done by EDAW staff. AEPGH therefore requests that the Corps DEIS for Phase 2 be prepared by an independent consultant so that the interests of the Federal Government in preserving the environment and in protecting its citizens, as displayed in the NEPA provisions, shall be effected.

O5-5

AEPGH understands that a clearly better challenge of this sort to Phase 2 of the NLIP should be brought via a challenge to the Phase 2 FEIS which the Corps has recently approved. AEPGH, in fact, will be bringing that challenge soon. However, when dealing with a conflict of interest in approving any given Phase of a large project, AEPGH feels it is appropriate to bring the conflict to light in every document pertaining to the project – or part of the project.

AEPGH also specifically objects to this same conflict of interest as to the EIR and EIS work for Phase 3. The same contentions hold true for the Phase 3 work as for the Phase 2 work. Specifically, the environmental documents were prepared by EDAW – who was hired by the SAFCA Board. The EIR will be certified by the SAFCA Board. The EIS was also prepared by EDAW. No independent study or independent review of the Phase 3 environmental impacts has been made. O5-5 Cont'd

AEPGH requests that an independent panel with expertise in environmental impacts be given the opportunity to review the EIR/EIS for both Phase 2 and Phase 3 of the NLIP.

IV. FUNDING

With the advent of the recession of the United States economy and, especially, the California economy, SAFCA has no reasonable assurance that it will ever receive funding to build the NLIP project and to provide for the mitigation requirements specified in the EIR for Phase 2 and Phase 3 of the NLIP. SAFCA has charged into the project flying the "early implementation" banner. Thus, without funding assured, SAFCA nevertheless will borrow money from the taxpayers of California to pay for the project with the hopes that the Federal Government will one day reimburse them. This ploy is nothing new. (See, e.g., Wimpy's "I'll gladly pay you Tuesday for a hamburger today.") The facts are that California does not have the money to fund the entire project and the Federal Government, via the Corps of Engineers, does not either. Recognizing this difficulty, SAFCA's latest plan is to ask Rep. Matsui to ask Congress to directly fund the project – bypassing the usual Corps' procedure. Unfortunately, the NLIP is not the only project in the United States needing money. There are a seemingly infinite number of other projects vying for the money – as well as a seemingly infinite number of national programs and national bailout plans that need federal money. SAFCA is very unlikely to receive funding via Rep. Matsui's bill. O5-6

The Phase 3 DEIR/DEIS significance of SAFCA's funding problems is quite clear. If SAFCA does not receive sufficient funding to complete the project, SAFCA will clearly not have sufficient funding to comply with the mitigation requirements detailed in the DEIR/DEIS. AEPGH sees the image of an abandoned, poorly constructed, partially finished, unmitigated eyesore in Sacramento/Sutter counties – with no significant flood protection to the Natomas Basin.

AEPGH requests that SAFCA reanalyze its funding mechanism via a new funding EIR which takes into consideration the economic crisis facing this country. The funding concept relied on by SAFCA at the beginning of the NLIP is no longer viable. AEPGH requests SAFCA to take a responsible approach to its push to build the levee by ceasing all levee construction in the NLIP until SAFCA has verified funding available to complete the NLIP project.

V. 24/7 CONSTRUCTION ACTIVITES

In its Phase 2 EIR, SAFCA analyzed the Phase 2 work on a project level and analyzed the entire NLIP on a programmatic level. There was no mention of the need to conduct the construction on a 24 hours 7 day per week schedule. In a SEIR to Phase 2, SAFCA first revealed its plan to work 24/7. The SEIR report concluded that this 24/7 construction schedule was a substantial environmental impact without mitigation. SAFCA's stated its reasons for the 24/7 plan were "to shorten the construction period and implement an improve construction technique." In SAFCA's Phase 3 DEIR/DEIS, the 24/7 plan is again presented. According to the DEIR/DEIS, the noise and light glare produced by the 24/7 plan is SIGNIFICANT and UNAVOIDABLE. (See ES-11.) The reasons given for planning the 24/7 construction are 1.) "to manage the risk of delay" and 2) necessary "because of constraints on construction schedule". In other words, SAFCA contends that the impact of the 24/7 work is UNAVOIDABLE because to work during normal construction hours (8:00 a.m. to 5:00 p.m.) could cause a delay to the project. This is a concrete example of SAFCA's overall policy that speed shall take precedence over any other factor pertaining to the project. However, SAFCA's infatuation with speed is NOT a valid basis for declaring the impact "unavoidable". Most of the impact of the 24/7 concept could be avoided by simply taking a little longer to build the project or by bringing more equipment and manpower to the job so that it could be accomplished during normal working hours. For example, the use of THREE slurry wall machines working simultaneously would accomplish the same task during normal working hours as would the use of ONE slurry wall machine for 24 hours. AEPGH objects to SAFCA's claim that speed is an overriding consideration when doing a CEQA or NEPA analysis. Speed is an overriding concern of SAFCA, but it is not an overriding concern when considering environmental impact.

O5-7

AEPGH objects to any 24/7 construction by SAFCA. (1) There are several ways to easily avoid this significant impact altogether, and (2) SAFCA's reasons for wanting to implement the 24/7 construction schedule are not compelling reasons to allow a significant impact on the environment.

VI. FAILURE TO PROVIDE CEQA/NEPA ANALYSIS FOR PROPOSED WATERSIDE VEGETATION AND ENCROACHMENT TAKING

According to the Phase 3 DEIR/DEIS, the NLIP project proposes to "Remove [waterside] encroachments as required to meet USACE, CVFPB, and FEMA criteria." Although SAFCA steadfastly refuses to reveal the number and type of the encroachments that they propose to remove on the waterside of the levee, it can be assumed that SAFCA intends to remove some of these trees, shrubs, etc. as part of the Phase 3 project. However, at no place in the DEIS/DEIR does SAFCA meaningfully address the environmental impact of the removal of these trees, etc. AEPGH requests that SAFCA immediately present final plans showing the specific vegetation and encroachments that SAFCA intends to remove and complete a thorough environmental analysis (EIR) showing the impact of this proposed removal.

O5-8

Related to the above request, AEPGH points out the failure of the DEIS/DEIR to adequately describe the "PRISM" concept discussed in the document. The DEIS/DEIR claims that the proposed project plan, the adjacent levee design, protects some of the presently existing waterside vegetation and encroachments by removing these items from the new "levee prism" which will be established by the presence of the new adjacent levee. Although the DIES/DEIR refers to this "levee prism", nowhere in the document is there a drawing or detail description which concretely describes the dimensions, location, etc. of this "prism". In order for the new "levee prism" concept to be a mitigating factor to the proposed removal of waterside vegetation and encroachments, this levee prism concept must be fully described. AEPGH requires a detailed, dimensioned drawing and description that fully describes the new levee prism which will result from construction of the proposed adjacent levee project. These drawings and descriptions must be specific to each reach along the project – showing the existing levee cross section and the proposed project cross section with the resulting levee prism shown in detail. O5-9

VII. OBJECTION TO OTHER SIGNIFICANT AND UNAVOIDABLE ENVIRONMENTAL IMPACTS

The subject DEIS/DEIR finds that there are 14 significant and unavoidable environmental impacts which would result from implementation of the proposed adjacent levee alternative of the NLIP Phase 3. Even assuming that the DEIS/DEIR is thorough and accurate in its environmental impact analysis (a questionable assumption), it is quite clear and AEPGH contends that the cumulative effect of 14 significant environmental impacts is an unacceptable assault on the environment surrounding the NLIP. Although the alternative designs discussed by SAFCA also involve many of the same significant impacts, AEPGH contends that other alternatives – including those rejected by SAFCA and including those not considered by SAFCA – would provide the necessary protection for the Natomas Basin without assaulting the environment. AEPGH requests that, prior to the SAFCA Board's certification of the EIR and before the Corps issuance of the permits and permissions, an independent hydrological and environmental study of the entire NLIP be conducted by a recognized expert or panel of experts chosen by special appointment by the United States District Court. Jurisdiction for the Court to appoint such a special commission can be obtained in a number of ways and therefore is not a consideration of this request. O5-10

AEPGH refers to the DEIS/DEIR NLIP Phase 3 Landside Improvements Project, Section 5.4, page 5-34 for the list of the 14 Significant and Unavoidable Environmental Impacts – and incorporates this page into this Comment letter by reference.

VIII. WATERSIDE WATER WELL DEGRADATION RESULTING FROM THE SLURRY CUTOFF WALLS

Although the DEIS/DEIR offers a brief discussion of the groundwater effects of the miles O5-11

of deep slurry walls in the project, there is not an adequate evaluation of the effects of these slurry walls on the existing (and future) water wells which service the residences on the waterside of the levee. The purpose of the slurry walls is to "cut off" water from running from the area of the Sacramento River to the area of the land side of the levee. Clearly, these walls will also prevent water from running the opposite way and will alter the flow of underground water streams located below the waterside areas on which the waterside residences are located. It is equally clear that because of these underground water changes, the existing water wells on the water side of the levee will be affected. If the quality and/or quantity of the water available to these waterside wells is negatively affected, this is clearly a significant impact on the environment – an impact which has not be analyzed in the present DEIS/DEIR. AEPGH suggests that the DEIS/DEIR is deficient in this regard and requires that the DEIS/DEIR be modified to include a detailed environmental impact evaluation of this significant situation.

O5-11 Cont'd

Therefore, based upon all of the above, we do hereby object to the approval of the projects entitled Natomas Levee Improvement Program proposed by the Sacramento Area Flood Control Agency (SAFCA.) We specifically object to the SAFCA Board's certification of the EIR for Phase 3 and object to the Corps issuance of a 408 permission and a 404 permit to SAFCA for Phase 3 work.

Sincerely,

ASSOCIATION FOR THE ENVIRONMENTAL PRESERVATION OF THE GARDEN HIGHWAY, a community association

By: _____ Patrick Tully, Co-Chair

By: _____ Doug Cummings, Co-Chair

Garden Highway Community Association
1500 W. El Camino Ave., #640
Sacramento, CA 95833

Received copy of these Comments on July 25, 2008
Erin M. Hanlon

July 24, 2008

Kathleen A. Dadey, Project Manager
Elizabeth Holland, Planning Division
U.S. Army Corps of Engineers (Corps)
1325 J Street Room 1480
Sacramento, CA

RE: Comments on Environmental Impact Study
Natomas Levee Improvement Program – Landside Improvement Project
SAFCA's Request for 408 Permission and 404 Permit

Dear Corps of Engineers:

Garden Highway Community Association is a community association whose membership includes all waterside and landside property owners along the Garden Highway in the area addressed in SAFCA's Natomas Levee Improvement Program. We list below our comments and concerns regarding the Draft Environmental Impact Study (DEIS) issued by the Corps pertaining to SAFCA's NLIP. Unless stated otherwise, these comments apply to all three alternative proposals discussed in the DEIS

I. LETTER TO SAFCA DATED NOVEMBER 27, 2007 FROM KENYON/YEATES ATTORNEYS REPRESENTING GARDEN HIGHWAY COMMUNITY ASSOCIATION

Attached is a letter dated November 27, 2007, addressed to Heather Fargo, as Chair of the Board of Directors of the Sacramento Area Flood Control Agency (SAFCA). We adopt the comments in this letter in full as comments to the Corps DEIS. The exhibits to this letter are not included since this letter with exhibits was submitted to the Corps during the initial scoping phase of this process. We have reviewed the Draft EIS prepared by the Corps and have found that the Corps has not adequately addressed the issues (comments) contained in this letter. Accordingly, we renew our comments contained in this letter as to the Draft EIS.

II. LETTER TO THE STATE RECLAMATION BOARD DATED DECEMBER 19, 2007 FROM KENYON/YEATES ATTORNEYS REPRESENTING GARDEN HIGHWAY COMMUNITY ASSOCIATION

Attached is a letter dated December 19, 2007, addressed to Benjamin Carter, as President of the

Reclamation Board. We adopt the comments in this letter in full as comments to the Corps DEIS. The exhibits to this letter are not included since this letter with exhibits was submitted to the Corps during the initial scoping phase of this process. We have reviewed the Draft EIS prepared by the Corps and have found that the Corps has not adequately addressed the issues (comments) contained in this letter. Accordingly, we renew our comments contained in this letter as to the Draft EIS.

III. LETTER FROM THE U.S. FISH & WILDLIFE SERVICE AND THE CALIFORNIA DEPARTMENT OF FISH AND GAME TO JOHN BASSETT OF SAFCA REGARDING COMMENTS ON SAFCA'S DEIR ON THE NLIP- LIP

Attached is a letter from the U.S. Fish & Wildlife Service and the California Department of Fish and Game to SAFCA containing comments on SAFCA's DEIR. We have read this letter and fully adopt the comments in this letter as our comments to the Corps Draft EIS. We have read the Corps Draft EIS and maintain that the Draft EIS does not adequately address the concerns stated in this letter.

IV. LETTER FROM KRONICK MOSKOVITZ TIEDEMANN & GIRARD (KRONICK) REPRESENTING RECLAMATION DISTRICT 2035 ADDRESSED TO JOHN BASSETT OF SAFCA DATED OCTOBER 29, 2007.

Attached is a letter from the Kronick law firm representing Reclamation District 2035. We have read this letter and fully adopt the comments in this letter as our comments to the Corps Draft EIS. We have read the Corps Draft EIS and maintain that the Draft EIS does not adequately address the concerns stated in this letter.

V. ALTERNATIVE TO SAFCA'S PROPOSED PLAN – A REGIONAL SOLUTION RATHER THAN A PIECEMEAL SOLUTION

Although presented through thousands of pages of justification, SAFCA's plan for NLIP condenses down to the placement of additional dirt on a very small section (26 miles out of 1200 miles of levees) of the Sacramento River levee. SAFCA's plan does not genuinely consider the effects of this piecemeal design on the other 1175 miles of Sacramento levees, does not consider the future effects of global warming, and does not address a catastrophic flood scenario. Simply put, more dirt added randomly to a levee system has never stopped a raging river from escaping its channel. Moreover, there is no assurance that the present NLIP plan will fit into the American River Common Features Project – once that project, hopefully a true regional proposal, becomes reality.

Instead of SAFCA's proposed plan, a regional plan must be implemented that allows a catastrophic water volume to dissipate over a wide area. The better thinking as to the regional plan for the Sacramento River focuses on the use of bypass areas to dissipate a "Katrina" type "avalanche"of water. Specifically, the intelligent solution for the Natomas Basin and greater

Sacramento flooding problem is the reworking and implementation of the Fremont Weir and the Sacramento Weir and their corresponding bypass areas. This solution has been studied by SAFCA in a 2003 study but was dismissed as being too time consuming to implement. This solution has been briefly mentioned and also dismissed in the Draft EIS as being too expensive. We challenge those conclusions. We think it unreasonable to approve an inadequate solution to the potential flooding – just because it is attainable more quickly than a viable solution. The Draft EIS is woefully inadequate in that it did not take a serious look at the Fremont and Sacramento Weir solutions to Natomas Basin flooding concerns.

The DEIS is also woefully inadequate because it did not adequately address a regional solution to the Sacramento flooding concerns. Specifically, the Draft EIS did not adequately address the impacts of SAFCA's proposed project on the peoples, properties, wildlife, etc. protected by the remaining approximately 1175 miles of Sacramento levees that will not be dealt with by SAFCA's approximately 26 mile project.

VI. NEGATIVE EFFECTS ON FISH, WILDLIFE, AND VEGETATION

The attached letter from the U.S. Fish & Wildlife/California Department of Fish & Game addressed some of the animals and vegetation that will be negatively affected by the project. We are concerned about the effects on **all** fish, wildlife, and vegetation found in the areas of the project. Accordingly, we list these fish, wildlife, and vegetation species that need to be considered in a thorough EIS..

1. Valley Elderberry Longhorn Beetle
2. Giant Garter Snake
3. Northwestern Pond Turtle
4. Swainsons' Hawk
5. Burrowing Owl
6. Cooper's Hawk
7. White-tailed Kite
8. Northern Harriers
9. Loggerhead Shrikes
10. White-faced Ibis
11. Blue Heron
12. Great Egret
13. California Linderiella
14. Vernal Pool Tadpole Shrimp
15. Midvalley Fairy Shrimp
16. Vernal Pool Fair Shrimp
17. Great Horned Owl
18. Barn Owl
19. Wood Duck
20. California Tiger Salamander

21. Western Spadefoot
22. Oak Trees (all species found in area); special note Heritage Oak Protection Ordinances
23. Rose Mallow
24. Delta Tule Pea
25. Sanford's Arrowhead
26. Central Valley Chinook Salmon
27. Central Valley Steelhead
28. Green Sturgeon
29. Sacramento Splittail
30. Hardhead

For all of the above species we object to the relatively minimal analysis as to the presence of the species in the proposed project area – as well as the lack of information as to the locations of these species within the project areas. We object to the failure to properly analyze the direct effect on these species resulting from the construction of the project. We also object to the failure to properly analyze the effect of the finished project on these species. This latter effect includes destruction of nesting sites (birds), destruction of foraging sites (all animals), destruction of food supplies (all animals) and destruction of protective habitat (plants and animals). We object to the relocation proposals (e.g., Northwestern Pond Turtles) and to the creation of artificial corridors for certain species (e.g., giant garter snake.) These practices, while appearing satisfactory on paper, have been shown to be ineffective at best.

The Draft EIR concludes that the project's proposed destruction of a great number of large/old oak trees (Heritage Oaks, in many cases) along the land side of the existing levee is a significant impact without any meaningful mitigation measure. We ask that the Corps require that these trees be saved – as a condition to any permit or permission given to SAFCA. As well, the proposed mitigation measures for the loss of shaded riverine aquatic (SRA) habitat are inadequate. The lost SRA habitat cannot be instantly created as implied in the Draft EIR. Restoration, if it ever occurs, will take decades – causing decades of SRA habitat loss.

VII. EFFECTS OF PROJECT ON GARDEN HIGHWAY RESIDENTS AND LANDOWNERS

The Draft EIS provides minimal analysis of the effects of the proposed projects on the homeowners and landowners on each side of the Garden Highway. The EIS does recognize that certain impacts to Garden Highway residents are significant, but labels them unavoidable – to "be minimized to the extent feasible." (ES - 11.) These impacts include significant increases in traffic on local roadways in Sutter County, significant air quality impacts, significant noise impacts – resulting from the construction.

The Draft EIS also concludes that "the expansive footprint of the project would result in the conversion of a significant amount of important farmland to non-agricultural use." (ES-11.)

The Draft EIS concludes that the "removal of a large number of mature trees (many are protected

oak trees) from the land side of the Sacramento River east levee would result in an unavoidable significant impact on visual resources." (ES-11.)

Rather than concluding that these impacts are unavoidable, the correct conclusion – for these reasons and for many other reasons – is that permission and permits should be denied in favor of a different alternative that avoids these significant impacts. The Fremont Weir and Sacramento Weir modifications and bypass modifications alternative would avoid these impacts altogether.

The Draft EIS concludes that the hydraulic effects and exposure to flood risk to peoples and properties for the three alternatives is minimal. This conclusion was made without considering the effects of global warming and without considering the effects of inevitable additional construction and changes along the Sacramento River (including other levee modifications)

The Draft EIS lists a number of areas of comment/concern received during the scoping phase which were not discussed in the Draft EIS. These include the effects of the cutoff wall construction on Garden Highway groundwater supplies, relocation of Garden Highway power poles, and adequate compensation for landowners. (ES-12.) We object to the failure of the Draft EIS to consider these concerns. The proposed cutoff wall is designed to prevent underseepage of water from the waterside of the levee to the landside. Obviously, this wall will stop ground water movement as well. In many cases, the depth of domestic water wells serving the Garden Highway residents is less than the depth of the proposed cutoff wall. Water quantity as well as water quality will be affected. The relocation of the power poles can create a negative visual effect. This, along with the removal of the mature oak trees on the land side, will have a cumulative negative impact on the Garden Highway. This negative impact will not only affect the residents along the Garden Highway, it will also impact the thousands of visitors that travel along the Sacramento River, i.e., the Garden Highway – a natural scenic asset of Sacramento. (The Garden Highway has been declared a "Designated Scenic Route".)

The subjection of landowners in the project area to the negative impacts associated with the proposed project is an inverse condemnation of the properties. This taking of landowner assets by SAFCA for the benefit of the residents of the Natomas Basin requires appropriate compensation for the landowners.

Therefore, based upon all of the above, we do hereby object to the approval of the projects entitled Natomas Levee Improvement Program as sponsored by the Sacramento Area Flood Control Association (SAFCA). We specifically object to the issuance of 408 permission and 404 permit issuance to SAFCA for phase I work.

Sincerely

GARDEN HIGHWAY COMMUNITY ASSOCIATION

By: _____ Doug Cummings, President

CHARITY KENYON
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November 27, 2007

Heather Fargo, Chair
Members of the Board of Directors
Sacramento Area Flood Control Agency
1007 7th Street, 7th Floor
Sacramento, CA 95814-3407

ATTN: John A. Bassett **(HAND DELIVERED (11-27-07)**

Re: *Natomas Levee Improvement Program – Landside Improvements Project*

Dear Chair Fargo and Members of the Board of Directors of SAFCA:

I am writing on behalf of our client the Garden Highway Community Association, which is made up of landowners who reside or own property on either side of the proposed east side levee improvements along the Sacramento River. The environmental consequences of the proposed east side levee improvements were the subject of an environmental impact report ("EIR") prepared for the Natomas Levee Improvement Program – Landside Improvements Project (SCH #2007062016). On behalf of our client Association and its members, we have the following comments on SAFCA's environmental review of the Landside Improvements Project ("NLIP").

Determining the Significance of Hydraulic Impacts

The residents who live on the riverside of the east side levee uniformly are concerned about the effect the levee raising will have on their residences. As pointed out by SAFCA in the certified EIR entitled Local Funding Mechanisms for Comprehensive Flood Control Improvements for the Sacramento Area, "These improvements would reduce the risk of overtopping and failure of these levees, thereby causing more water to be retained in the channels under extreme flood conditions."[1] Therefore, these residents ask if the increased height of and improvements to the levees will retain more floodwaters within the flooded river channel defined by the levees to the east and west, how can increasing the height of and improvements to the east levee not increase the opportunity for their homes to be flooded during a major flood event?

Not surprisingly these residents have pointed out in their comments on SAFCA's project, based on their personal experience living along the Sacramento River, that more flow coming down the

[1] Local Funding Mechanisms Program EIR Vol. 1, SAFCA (EDAW, Nov. 2006), § 4.4, p. 4.4-8. (Attached as Exhibit A)

Sacramento River and contained within the higher levees will expose their residences to a substantial risk of being flooded, increase the height of the water when their residences are flooded, and increase the time their residences are flooded. This substantial risk or change in the existing situation is a significant adverse change in the existing environment that should have been addressed in SAFCA's EIR.

UNET Hydraulic Computer Model Simulation

In order to determine whether the proposed project would expose people or structures to a significant risk of loss, injury, or death caused by flooding, SAFCA's engineering consultant, MBK Engineers, used a UNET hydraulic computer model to compare the existing conditions in the waterways surrounding the Natomas Basin and in the larger Sacramento River Flood Control Project ("SRFCP").

Based on this computer simulation, despite the fact that the stated purpose for the raising the levee is to cause more water to be retained on the riverside of the levee system, SAFCA's consultant's computer model has determined that "the risk of damage is the same under the 'with' and 'without' project conditions."[2] Based on this conclusion, at least one local Garden Highway resident questioned the need for the increased height in the levee if there was absolutely no change in the river "with" or "without" the project.[3] This commenter also questioned the variables that were put into SAFCA's computer model.[4]

Understandably, longtime residents along the Garden Highway are a bit skeptical of this computer simulation. One resident pointed out to me that when the gate blew out at Folsom Dam in July 1995, releasing a substantial amount of American River water into the lower American River channel, this increased flow from the American River backed up the Sacramento River. During this brief period, there was a recognizable 3.5 feet of rise –Sacramento River level went from 16.3 ft to 19.8 ft at Verona in a matter of hours with the 40,000 cfs flow increase on the American River resulting from the failed gate.

Lack of Information in the EIR about the Assumptions Used in the Computer Simulation

The hydraulic analysis in SAFCA's computer simulation is a bit of a black box. Based on the terse description of the model in the EIR, the public has very little information about the assumptions or variables that went into the computer model. The explanations provided at page 3.4-6 and Appendix B of the DEIR provide very limited information about the scope of the hydraulic simulation program and the assumptions that were built into the program. In order to understand the Sacramento UNET hydraulic simulation model, it appears the lay reader would have to review the U.S. Army Corps of Engineers (Corps) Sacramento-San Joaquin River Basins Comprehensive Study referenced in the EIR.[5] In a recent decision, the California Supreme Court

[2] NLIP Landside Improvements Project FEIR, SAFCA (EDAW Nov. 2007) p. 2-7.
[3] NLIP Landside Improvements Project FEIR, p. 3-135.
[4] *id.* at pp. 134-135.
[5] NLIP Landside Improvements DEIR, § 3.4.1.3, p. 3.4-2.

was very critical of a lead agency that simply referenced prior studies but failed to provide the information in the EIR:

> The data in an EIR must not only be sufficient in quantity, it must be presented in a manner calculated to adequately inform the public and decision makers, who may not be previously familiar with the details of the project. Information scattered here and there in an EIR appendices' or a report buried in an appendix is not a substitute for a good faith reasoned analysis.[6]

SAFCA's EIR fails to adequately inform the public about the assumptions that went into the hydraulic simulation. The interested and affected public has no option but to accept SAFCA's conclusion.

Certain Assumptions Used In The UNET Modeling Differ Between Two Analyses

The DEIR points out that 90% of the flood flows approaching Sacramento from the north and the east come from the Feather and American Rivers.[7] The brief summary of the Hydraulic Impacts Analysis at Appendix B of the DEIR does describe the peak flows in the Sacramento River downstream of the Natomas Cross Canal in the 100-year and 200-year simulations, but that is all.[8] There is no discussion about what flows are coming out of the American River in the 100-year and 200-year simulations. As pointed out above, these residents know that the American River can influence the height of the Sacramento River above the confluence of these two great rivers.

The Draft Floodway Management Plan, which can be found on SAFCA's website at the following link (http://www.safca.org/collaboration/DraftFMP.htm), does a slightly better job of explaining Sacramento UNET hydraulic simulation model:

> The base computer model used for the urban design standard analysis is a UNET model, initially developed by the Corps for the Sacramento and San Joaquin Rivers Comprehensive Study and subsequently updated and recalibrated by MBK Engineers using information from the January 1997 flood event (MBK Engineers 2003). The model includes the Sacramento River from Collinsville (River Mile [RM] 0) to Woodson Bridge (RM 218), the lower reaches of major tributaries, and the Sutter and Yolo Bypasses. The water surface elevations produced by the model are the basis for determining appropriate levee heights capable of meeting the urban design standard.
>
> The urban standard flood elevations for the Sacramento region were produced based on the following key assumptions:

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[6] *Vineyard Area Citizen, etc. v. City of Rancho Cordova* (2007) 40 Cal.4th 412, 442.
[7] NLIP Landside Improvements DEIR, SAFCA (EDAW Sept. 2007), § 3.4.2, p. 3.4-4.
[8] NLIP Landside Improvements DEIR, Appendix B, p. 2.

- 200-year flood event with Folsom Dam Modifications in place, and limiting reservoir releases to the lower American River to 160,000 cfs flow (the 1986 flood peaked at approximately 138,000 cfs);
- Upstream levees that do not meet the 1957 design profile are assumed to be improved to meet that standard, thereby containing and passing peak flows downstream; and
- Upstream levees that may overtop during future high flows predicted by the model **do not breach** (overtopped levees often cause levee breaches which quickly erode and widen the opening by several hundred feet. Compared to overtopping flow, a levee breach greatly increases the amount of river flow leaving the channel and entering the adjacent floodplain. Therefore, breached levees inadvertently lessen flood risk downstream of the breach.).

These conservative modeling assumptions have been agreed to in principle by the staff of SAFCA, the City of Sacramento, and the City of West Sacramento. While the same base model is also used to analyze cumulative effects of floodway encroachments, described below under "Guidelines for Hydraulic Analysis and Monitoring," certain assumptions used in the modeling differ between the two analyses. In particular, the modeling for the urban design standard assumes that modifications to Folsom Dam that are currently underway or planned are in place. The modeling for the cumulative encroachments in the Forum's river corridor and SRMP reach conservatively assumes that the modifications to Folsom Dam are not in place. The reason for this difference is that the urban design standard requires a reasonable numeric result that will guide the design of future, long-term levee improvement projects, while the cumulative encroachments analysis was intended to conservatively estimate the sensitivity of flow in the floodway to hypothetical future encroachments (e.g., more marinas, bridges, private docks, shoreline vegetation, and river access structures, etc.).

Since a system wide standard for a higher level of flood protection (e.g., urban design standard) does not yet exist, an analysis of system wide impacts is necessary for local projects. Ultimately, the FMP's urban design standard should be based on a peer-reviewed, 200-year flood surface profile as determined by the Corps, and subsequently used as a system wide regulatory standard for levees and floodways. The Corps has not completed a new, updated system-wide model, and there is currently no schedule for model completion and release for use by the Reclamation Board. In the interim and short term, riverside urban projects will use the SAFCA/MBK model results as a basis for design of projects underway in the FMP planning area.[9]

In other words, the UNET computer model uses different assumptions depending upon whether SAFCA wants a "reasonable numeric result that will guide the design of future, long-term levee

[9] Sacramento River Corridor Floodway Management Plan, Sacramento River Corridor Planning Forum (Jones & Stokes May 2006) p. 3-25 - 3-27. (Excerpt attached as Exhibit B.)

improvement projects" or to "estimate the sensitivity of flow in the floodway to hypothetical future encroachments."

Evaluating the Consequences of Encroachments Within the Flooded Channel

The Draft Floodway Management Plan simulated high river flows in the Sacramento and American Rivers to determine the consequences of future encroachments:

> The potential future hydraulic effects of floating docks, in-channel marinas, bank protection projects, and changes in vegetation were estimated using a hypothetical set of changes in the floodway and conservative assumptions regarding their hydraulic effects.
>
> The results of the hydraulic analysis estimate a maximum impact on stage downstream of the American River of 0.07 foot in the 1997 Flood event and 0.05 foot in the Maximum Flow event. Upstream of the American River, the maximum impact on stage occurs near I-5 and is estimated at 0.2 foot for the 1997 Flood event and 0.15 foot for the Maximum Flow event. The effects on river stage are minimized by slight increases in diversions to the Yolo Bypass at the Sacramento and Fremont Weirs. For example, in the 1997 Flood simulation, approximately 1,400 cubic feet per second (cfs) less flows downstream in the Sacramento River at the latitude of Sacramento, and approximately 1,400 more flows in the Yolo Bypass. Because the increase in flow in the Yolo Bypass is small compared to the total flow (0.3%), the computed increase in water surface in the Yolo Bypass is very small (0.03 foot). Similar effects occur in the Maximum Flow scenario.[10]

The 0.2 foot increase in elevation near the I-80 bridge, which corresponds with the sharp bend in the Sacramento River at Reaches 18B and 19A,[11] exceeds SAFCA's 0.1 threshold of significance in the Landside Improvements Project EIR.

NLIP EIR Fails to Inform Reader About Assumptions Used in UNET Model

We do not know what assumptions SAFCA's consultant used in running the UNET simulation for the Landside Improvement Project EIR. Therefore, we do not know whether the simulation considered the consequences of existing or future encroachments into the river channel.

For example, as the river flows past the improved eastside of the levee system, increased flood waters encounter lots of vegetation, houses, accessory buildings, and private boat docks.[12] When river flows reach the sharp bend at Reach 18B, the river encounters the I-80 bridge supports, the West Sacramento Water Plant intake towers, more vegetation, substantial marina docks, the flood flow from Main Drainage Canal being pumped into the river by the RD 1000 and City of

[10] *id.* at p. 3-28 - 3-29 (Exhibit B.).
[11] See NLIP Landside Improvements DEIR, Exhibit 2-10c.
[12] See NLIP Landside Improvements DEIR, Exhibits 2-9 & 2-10a – 10c, pp. 2-77 – 2-81.

Sacramento Pumping Plants, vegetation on both sides of the river, another substantial marina, and then the American River at flood stage. Did SAFCA's simulation consider all of these matters? We cannot tell from reading the DEIR, Appendix B to the DEIR, or the seven- page explanation provided in the FEIR.

Lack of Information Fuels Skepticism About the Conclusion Reached

Is it not surprising that residents who have lived along the river side of Garden Highway for decades, who witness first hand the vagaries of the impinged but powerful Sacramento River, and who have lived through the 1986 and 1997 floods are skeptical of a "black box" computer-based determination that tells them their homes are not in jeopardy. This skepticism increases when one sees that the model appears to be tweaked to obtain different results for different needs.

In addition to Garden Highway residents' skepticism, landowners on the north side of the Natomas Cross Canal levee improvements, Reclamation District (RD) 1001, and RD 2035 are equally skeptical that one-sided levee improvements will not have significant adverse effects upstream and downstream of these improvements. In a Friday November 23, 2007 article in the Sacramento Bee about the Sacramento Riverfront shared by Cities of West Sacramento and Sacramento, the State Reclamation Board's chief engineer, Steve Bradley, acknowledged a problem if West Sacramento unilaterally raises its levees to provide for its River Walk project. Mr. Bradley was quoted in the Sacramento Bee article pointing out that West Sacramento's action would create a "levee parity" problem, "If levees are higher in one area than another, it means other spots might be more vulnerable to flooding."[13] West Sacramento is proposing to raise a one mile stretch of its levee a couple of feet.[14] SAFCA is proposing the raise the levees on the south side of the 5.3 mile long Natomas Cross Canal and on the east side of the 18-mile long Sacramento River levee.[15] Has SAFCA anticipated a similar "levee parity" concern from the Chief Engineer when it submits this project to the Reclamation Board for approval?

Failure to Provide Information in EIR Frustrates CEQA's Purpose

The EIR fails to provide any meaningful information about the assumptions that went into the hydraulic modeling that led the lead agency to determine that its proposed levee improvement project will not have a significant adverse impact (i.e., flooding) on the riverside residents along the Garden Highway, the landowners along the north side of the Natomas Cross Canal, and the landowners on the west side within RD 2035 in Yolo County.

Repeatedly the California courts have acknowledged "the 'foremost principle' in interpreting CEQA is that the Legislature intended the act to be read so as to afford the fullest possible

[13] "Riverfront: Plans to extend walkways face large hurdles," Sacramento Bee, November 23, 2007. (Attached as Exhibit C.)
[14] Exhibit C.
[15] NLIP Landside Improvements DEIR, p. 2-6.

protection to the environment within the reasonable scope of the statutory language."[16] As the California Supreme Court has stated,

> The EIR is the primary means of achieving the Legislature's considered declaration that it is the policy of this state to "take all action necessary to protect, rehabilitate, and enhance the environmental quality of the state. . . . The EIR is also intended "to demonstrate to an apprehensive citizenry that the agency has, in fact, analyzed and considered the ecological implications of its actions."[17]

Since the public was not provided with the assumptions that were used to run the hydraulic computer model, the very interested public in this matter have been denied a meaningful opportunity to participate in CEQA's mandatory environmental review proceeding.[18] California's high court has emphasized "public participation is an essential part of the CEQA process."[19]

> To facilitate CEQA's information role, the EIR must contain facts and analysis, not just the agency's bare conclusions or opinions. This requirement enables the decision-makers and the public to make an "independent, reasoned judgment" about a proposed project.[20]

The California Supreme Court has acknowledged that interested citizens hold a "privileged position" within the CEQA process "based on a belief that citizens can make important contributions to environmental protection and on notions of democratic decision-making."[21] SAFCA's evaluation of the proposed project's effects on river hydraulics and hydrology fails to satisfy CEQA's informational requirements.

The Approach Used in NLIP Has Been adopted by the State Legislature

In Master Response 1 SAFCA claims the Legislature has "approved the project features necessary to provide a 200-year level of flood protection along the American and Sacramento Rivers and within the Natomas Basin as described in the final engineer's report dated April 19, 2007. "[22]

Based upon the certified EIR for the Local Funding Mechanisms for Comprehensive Flood Control Improvements for the Sacramento Area, the California Legislature passed and Governor Schwarzenegger signed into law Senator Steinberg's Senate Bill 276 (Stats. 2007, ch. 641), which amends section 12670.14 of the Water Code authorizing the appropriation of "an

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[16] *Communities for a Better Environment v. CA Resources Agency* (2002) 103 Cal.App.4th 98, 110.
[17] *Laurel Heights Improvement Ass'n v. Regents of the Univ. of California* (1988) 47 Cal.3d 376, 392 ("*Laurel Heights I*").
[18] See *Mountain Lion Coalition v. CA Fish and Game Comm'n* (1989) 214 Cal.App.3d 1043, 1050-1051.
[19] *Concerned Citizens of Costa Mesa v. 32nd District Agricultural Assoc.* (1987) 42 Cal.3d 929, 935.
[20] *ibid.*
[21] *id.* at p. 936.
[22] NLIP Landside Improvements Project EIR, p. 2-6; see also, e.g., Response to Comments 21-3 & 55-1 at p. 3-279.

estimated cost to the state of the sum that may be appropriated by the Legislature for state participation upon the recommendation and advice of the [Department of Water Resources] or the Reclamation Board" for "the project features necessary to provide a 200-year level of flood protection along the American and Sacramento Rivers and within the Natomas Basin as described in the final engineer's report dated April 19, 2007, adopted by the Sacramento Area Flood Control Agency."[23]

Despite SAFCA's broad claim in Master Response 1, the California Legislature did not approve the Natomas Levee Improvement Program – Landside Improvement Projects. The specific activities described in the Natomas Levee Improvement Program – Landside Improvements Project EIR has not been previously adopted by SAFCA. Furthermore, as the certified Local Funding Mechanisms EIR acknowledged, "The NLIP activities have not been analyzed previously under CEQA."[24] If the state legislature had, in fact, approved the project features described in the final engineer's report, then the Board of Directors of SAFCA and the State Reclamation Board (soon to be the Central Valley Flood Protection Board) would not need to approve the Natomas Levee Improvement Program – Landside Improvements Project. Further, the project would not be subject to CEQA, since actions by the state legislature are not subject to CEQA.[25]

For the State of California, the final paragraph of the SB 276 is probably the most important part of the bill:

> Prior to any reimbursement pursuant to subdivision (a), the agency shall execute an agreement with the department under which it agrees to indemnify and hold the state harmless from damages due to the construction, operation, or maintenance of those projects and agrees to operate, maintain, repair, replace, and rehabilitate those projects, or provide the agreement of its appropriate member agency to do so.[26]

SAFCA's levee improvements are not exempt from CEQA. Therefore, SAFCA's environmental review of the NLIP, including the legal adequacy of SAFCA's determination of the proposed project's significant effect on the existing environment, is governed by CEQA's environmental review requirements.

The NLIP EIR Determination of Significant Effect of the Project on Adjacent Properties Fails to Provide a Baseline Comparison

The determination that SAFCA's project will not have a significant effect on the Garden Highway residents, Yolo County landowners on the west side of Sacramento River, and Sutter County landowners on the north side of the Natomas Cross Canal has played a critical role in truncating the lead agency's environmental review of the proposed project. Throughout the EIR

[23] Stats 207, ch. 641, § 2; Wat. Code, § 12670.14.
[24] Local Funding Mechanisms Program EIR Vol. 1, § 3.4.4, p. 3-35.
[25] CEQA Guidelines, § 15378, subd. (b)(1); see also CEQA Guidelines, § 15379.
[26] Stats 2007, ch. 641, §3. (A copy of the chaptered version of SB 276 is attached as Exhibit D.)

and especially in the responses to public comments, SAFCA merely relies on the conclusions derived from the hydraulic model simulation. Yet, this computer simulation does not satisfy CEQA's requirements in evaluating the project's significant effect on the existing environment.

In determining whether a project's impacts may significantly affect the existing environment, there must be a "baseline" set of environmental conditions to use as a comparison to the anticipated project impacts. As the Court of Appeal has explained, "it is only against this baseline than any significant environmental effects can be determined."[27]

The NLIP DEIR fails to evaluate the environmental consequences of its east side levee improvements against the existing environmental conditions. Instead, "[f]or purposes of evaluating the hydraulic effects of the NLIP, SAFCA employed levee failure scenario (a), because it is reasonable, practical, is easily understood, and because a sensitivity analysis indicated that the estimated hydraulic characteristics would be the same for each of the level (sic) failure scenarios analyzed."[28] Scenario (a) assumes a levee fails when water level exceeds the top of the levee by 0.5 feet. This is not the baseline environmental conditions, this is a hypothetical scenario for purposes of running the UNET computer model. The existing levee along the Garden Highway has never been topped by six inches of floodwaters.

The NLIP EIR and SAFCA's hydraulic impact analysis assumes that portions of the west side of the Sacramento River opposite the Natomas Basin will be raised. There is no evidence to support this assumption.

Based on the information in the NLIP EIR, we do not know what the actual physical baseline environmental conditions are within the project area. For example, what was the elevation of the river in 1997 (or 1986)? What was the maximum water level below the top of the existing levee? On the east side of the Sacramento River? On the west side of the Sacramento River? On the south side of the Natomas Cross Canal? On the north side of the Natomas Cross Canal?

What CEQA requires is the establishment of the existing physical environmental conditions. Several court decisions have determined that the impacts of a proposed project must be measured against the "real conditions on the ground."[29] "An EIR must focus on impacts to the existing environment, not hypothetical situations."[30] The proposed project's impacts must be compared against real, physical, environmental conditions. This would include the existing condition of the west side levees along the Sacramento River and the north side levee along the Natomas Cross Canal. This comparison would answer the question of "levee parity" and whether any spots along the river side of the east levee improvements or west side of the Sacramento River in Yolo County, or north side of the Natomas Cross Canal in Sutter County would be more vulnerable to flooding. In other words, if the east side has sufficient freeboard to ensure safe containment of the "200-year" design, how does this effect the existing lower levees along the west side of the river and the existing elevation of the homes along Garden Highway on the river

[27] *County of Amador v. El Dorado County Water Agency* (1999) 76 Cal.App.4th 99, 952.
[28] NLIP Landside Improvements Project FEIR, p. 2-5.
[29] *Save Our Peninsula Committee v. Monterey County Board of Supervisors* (2001) 87 Cal.App.4th 99, 121.
[30] *ibid.*

side of the improved levees. This analysis would also apply to the north side of the Natomas Cross Canal.

The NLIP DEIR failed to compare the effects of the proposed levee improvements against the existing physical environmental conditions. The failure to provide this analysis frustrates "the central function of the EIR, to inform decisionmakers about the impacts of the proposed project on the existing environment."[31]

NLIP EIR Illegally Segments the Whole of the Action

The NLIP EIR separates the levee improvements for the south levee of the Natomas Cross Canal and the east levee of the Sacramento River into two separate projects. The project description must include all parts of a proposed project, including all reasonably foreseeable future expansion,[32] to ensure that all of the potentially significant effects of the proposed project are evaluated in the DEIR.[33]

The NLIP EIR separates the landside levee improvements into two separate projects based on the lead agency's anticipated construction periods. The south levee work along the Natomas Cross Canal and the east levee work along the Sacramento River to Reach 4B is evaluated at a project level in the EIR. The remaining east levee work to Reach 20 along the Sacramento River is evaluated at a program level. The distinction between the two alleged projects is depicted on Table 2-1 of the DEIR entitled "Summary of the Major Elements of the Proposed Project."

Several residents along the Garden Highway commented about the environmental consequences of the proposed levee improvement project. This led to differing responses depending upon the comments made by the local residents. For example, SAFCA made the following response to one resident who was concerned about the "unmitigated impacts of the proposed levee improvements on the residents along the Garden Highway [including] the proposed relocation of the telephone lines, traffic and impacts of the levee raising."[34]

> The environmental impacts of the proposed project have been thoroughly analyzed in Chapter 3, "Environmental Setting, Impacts, and Mitigation," of the DEIR. In addition to adopting the mitigation measures identified in the DEIR and FEIR, SAFCA is interested in working with the affected property owners to determine the best options for minimizing these impacts.[35]

With regard to a comment about proposed project plans to drain roadway wastewater to the "waterside" of the slope along Garden Highway,[36] the response states,

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[31] *id.* at p. 127.
[32] *Laurel Heights I, supra*, 47 Cal.3d at p. 396;
[33] *City of Santee v. County of San Diego* (1989) 214 Cal.App.3d 1438, 1450.
[34] NLIP Landside Improvements Project FEIR, p. 243.
[35] *id.* at p. 246.
[36] *id.* at p. 3-248.

> As the DEIR noted in Section 2.3.2.3, "Installation of Surface Drainage Outlets Across Garden Highway," . . . would be constructed between the adjacent setback levee and the Garden Highway pavement. . . . These discharge pipes would require minor landscape improvements to prevent erosion and ensure applicable water quality standards are met.[37]

With regard to the project's impacts and components, the responses to these comments do not attempt to differentiate between the whole of the action regarding the levee improvement work along the Garden Highway.

In contrast to the responses above, the following response was made to Garden Highway residents who commented about the lack of available information in the DEIR "to even understand where their property is in relation to proposed work."[38]

> Potential impacts on specific properties located within the 2009-2010 project footprint will be analyzed at a project-specific level in a subsequent environmental document, and mitigation for significant effects on the environment will be identified. SAFCA anticipates that this subsequent environmental document will be issued in 2008.[39]

At the October 18, 2007 public hearing a Garden Highway resident commented about "whether the slurry walls were actually looked into as opposed to widening the levees."[40] SAFCA's response states,

> Cutoff walls are being considered for inclusion in the overall program as a potential seepage remediation measure and would be implemented in 2009 or 2010 if SAFCA determines that they would not significantly affect groundwater recharge. . . . Project-level analysis of the effects of the cutoff walls will be disclosed as more technical details of 2009-2010 construction become available.[41]

This remarkable chopping up of the whole of the project into separate projects and activities based upon SAFCA's construction timeline is not allowed under CEQA. Based on the confusing responses to Garden Highway residents' comments, it is not particularly clear that the lead agency understands what piece of the whole project is the "project" and what piece is the "program." This parsing of the whole NLIP has been consistently rejected by the California courts.

> State CEQA Guidelines section 15378, subdivision (a) defines the term "Project" as "the whole of an action, which has a potential for resulting in a physical change in the environment, directly or ultimately," and which is undertaken, supported or

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[37] *id.* at p. 3-250.
[38] *id.* at p. 3-231.
[39] *id.* at p. 3-234.
[40] *id.* at p. 287.
[41] *id.* at p. 288.

> approved by a public agency. Subdivision (c) of this section states, "[t]he term 'project' refers to the activity which is being approved and which may be subject to several discretionary approvals by governmental agencies. The term 'project' does not mean each separate governmental approval." " 'Project' is given a broad interpretation in order to maximize protection of the environment." (citation omitted) This ensures "that environmental considerations do not become submerged by chopping a large project into many little ones, each with a potential impact on the environment, which cumulatively may have disastrous consequences."[42]

It is relatively apparent from reading the NLIP EIR that future development and the general types of future activities involving the levee improvements along the Garden Highway from Reach 1 to Reach 19B are reasonably foreseeable, and, therefore, must be evaluated in one NLIP EIR for the whole of the action.[43] As stated by one of the Garden Highway residents, "As we all know, once a precedent is set upstream, it will be very difficult for us to depart from that established precedent when the plans for our own respective areas come up for consideration."[44]

Effect of Climate Change on the Proposed Project

The NLIP EIR barely acknowledges the impact climate change may have on the operation and maintenance of the Central Valley's levee system. In a response to a public comment about whether the DEIR took into account the effect of climate change on river flows,[45] SAFCA states, "this potential climate change effect is too speculative to reasonably draw a conclusion on regarding the significance of foreseeable direct effects on physical conditions at the project site."

We disagree that the potential climate change effect is too speculative. Climate change is real. The California Department of Water Resources ("DWR") recently published a technical memorandum report entitled "Progress on Incorporating Climate Change into Management of California's Water Resources." This document is readily available on the web at http://baydeltaoffice.water.ca.gov/climate change/DWRClimateChangeJuly06.pdf. Chapter 6 of DWR's technical report in entitled "Climate Change Impacts on Flood Management" offers some helpful information about the effect of climate change on flood management.[46] While acknowledging the uncertainty associated with evaluating changes in weather events due to climate change, DWR's technical report provides a description of climate change scenario data that would be suitable for analyzing climate change impacts on flood frequency.[47]

Considering what is at stake and the long-term nature of the levee improvements that SAFCA is undertaking, it does not seem at all unreasonable or too speculative to evaluate how changing climate conditions may affect the project area and the proposed levee improvements. An EIR's

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[42] *San Joaquin Raptor/Wildlife Rescue Center v. County of Stanislaus* (1994) 27 Cal.App.4th 713, 730.
[43] *Laurel Heights I, supra*, 47 Cal.3d at pp. 397-398.
[44] NLIP Landside Improvements Project FEIR, p. 3-197.
[45] *id.* at p. 3-219.
[46] A copy of Chapter 6 is attached as Exhibit F to the letter that has been hand-delivered to SAFCA's office.
[47] Exhibit F: p. 6-1.

"purpose is to alert the public and its responsible officials to environmental changes before they have reached ecological points of no return."[48]

NLIP Landside Improvement EIR Fails to Consider a Reasonable Range of Alternatives

The project's objectives are so narrowly defined that SAFCA lists the NLIP project as the first alternative. Then it goes on to select this alternative (the project) as the environmentally superior alternative. The CEQA Guidelines require the selection of the environmentally superior alternative to be made among the various alternatives to the project.[49] If it is determined that the "no project" alternative is the environmentally superior alternative, the EIR must also identify an environmentally superior alternative from among the other alternatives.[50] Here, because SAFCA has listed the project as an alternative to the project, the project is selected as the environmentally superior alternative to the project. Clearly, SAFCA has failed to follow the procedure described in the CEQA Guidelines.

It is also interesting that in describing the "no project" alternative, SAFCA claims that this would prevent the Natomas Basin from absorbing "up to 60,000 dwelling units and associated commercial and industrial developments."[51] Therefore, it appears SAFCA's NLIP is the catalyst for future growth in the Natomas Basin. However, in the Growth Inducing Effects section of the DEIR, SAFCA claims growth in the Natomas Basin will proceed with or without implementation of the proposed project, claiming the private development would build ring levees around the private development.[52] Yet, when rejecting Alternative 5 – Private Levees in Natomas, the NLIP EIR points out that these levees would need to be 25 feet high with 3:1 side slopes and would significantly adversely affect wildlife connectivity.[53] Therefore, it would appear that a private ring of levees around development within the Natomas Basin would not be consistent with the Natomas Basin Habitat Conservation Plan. We wonder what comfort future and present homeowners in the Natomas Basin would have living within a 25-foot high ringed berm.

It would appear that the anticipated growth in the Natomas Basin drives SAFCA's objective to move as quickly as possible. Therefore, it makes the consideration of a regional approach that may involve coordination with other public agencies less practical from SAFCA's perspective. This makes the alternatives analysis in the NLIP a bit of a paper exercise, as it appears, based on SAFCA's comments about the purpose of SB 276 and the Final Engineer's report dated April 19, 2007, that the agency has pre-determined the project leaving the public and its decisionmakers without a reasonable range of alternatives to consider and compare to the proposed project.[54]

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[48] *Laurel Heights I*, *supra*, 47 Cal.3d at p. 392.
[49] CEQA Guidelines, § 15126.6. subd. (e)(2).
[50] *ibid.*
[51] NLIP Landside Improvements DEIR, p. 6-14.
[52] *id.* at p. 5-2.
[53] *id.* at p. 6-15.
[54] See *Laurel Heights I*, *supra*, 47 Cal.3d at p. 425, ("We will not accept *post hoc* rationalizations for actions already taken . . . .").

NLIP EIR Fails to Adequately Mitigate for the Loss of Habitat and Take of Endangered Species

We concur with the comments of the United States Fish and Wildlife Service and the California Department of Fish and Game on the inadequacies of the NLIP EIR.

Urge SAFCA Board to Direct Staff to Revise and Recirculate the EIR

On behalf of the Garden Highway Community Association, we urge the Directors of SAFCA not to certify the NLIP EIR. Instead, the staff and its consultants should be directed to prepare a legally adequate environmental review of the proposed Natomas Levee Improvement Program that begins with a meaningful analysis of the real conditions along the Natomas Cross Canal and Sacramento River focusing on the proposed project's impacts to the existing environment, not a hypothetical situation based upon a computer simulation. We also encourage SAFCA to work with the new Central Valley Flood Control Board and other public agencies on a regional approach that would look to set back the levees and improve the existing weirs and bypasses in order to provide long-term protection to the region in anticipation of changing climatic conditions. Unless, or until, SAFCA complies with CEQA's informational requirements and revises and recirculates the NLIP EIR, the Garden Highway Community Association opposes the NLIP project. Attached as Exhibit E to this letter is a list of Association members who reside along the Garden Highway, and who oppose the NLIP Landside Improvements Project.

Sincerely,

//s//

Bill Yeates

Attachments: Exhibits A through F

cc: Client

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December 19, 2007

Benjamin Carter, President, and Members
The Reclamation Board
3310 El Camino Avenue, Room LL40
Sacramento, CA 95821

ATTN: Jay Punia, General Manager

Re: Application No. 18159-2, Sacramento Area Flood Control Agency, Natomas Levee Improvement Program, Natomas Cross Canal, Sutter County – December 21, 2007 Agenda Item 5.D.

Dear President Carter and Members of The Reclamation Board:

I am writing on behalf of our client the Garden Highway Community Association, which is made up of landowners who own property and residences immediately adjacent to the proposed landside levee improvements described as the Natomas Levee Improvement Program by the Sacramento Area Flood Control Agency ("SAFCA"). The environmental consequences of the proposed landside levee improvements were the subject of an environmental impact report ("EIR") entitled, Natomas Levee Improvement Program – Landside Improvements Project (SCH #2007062016), which was certified by SAFCA on November 29, 2007. In addition to certifying the EIR for the Natomas Levee Improvement Program, the SAFCA Board approved the "2008 construction projects, consisting of the 'Natomas Cross Canal South Levee Phase 2 Improvement Project' and the 'Sacramento River East Levee Phase 1 Improvement Project (Reaches 1 through 4B).'"

Incorporating Garden Highway Community Association's Letter to SAFCA

Attached as Exhibit 1 to this letter, is a letter I submitted to SAFCA on behalf of our client on November 27, 2007, which highlights where we believe SAFCA has prejudicially abused its discretion by failing to follow the California Environmental Quality Act's ("CEQA") mandatory environmental review procedures, resulting in their CEQA document being inadequate. Although Application No. 18159-2 only brings to The Reclamation Board the south side levee improvements along the Natomas Cross Canal, our clients' comments on the legal inadequacy of the EIR's evaluation of the Natomas Levee Improvement Program apply to this portion of the

project, and I am, therefore, incorporating the comments in this letter and its exhibits for purposes of The Reclamation Board's proceeding.[1]

Garden Highway Community Association Has Challenged SAFCA's Approval

On December 19, 2007, the Garden Highway Community Association filed a petition for writ of mandate in the Sacramento County Superior Court challenging SAFCA's certification of the Natomas Levee Improvement Program–Landside Improvements Project EIR (SCH #2007062016) and approval of the Natomas Levee Improvement Program and landside levee improvement projects, characterized by SAFCA in Resolution 07-105 as the "2008 construction projects, consisting of the 'Natomas Cross Canal South Levee Phase 2 Improvement Project' and the 'Sacramento River East Levee Phase 1 Improvement Project (Reaches 1 through 4B),'" for failing to comply with CEQA.

The Reclamation Board Acts As A Responsible Agency Under CEQA

For CEQA's purposes SAFCA is the lead agency for the proposed Natomas Levee Improvement Program and, therefore, was required to prepare and certify the above-referenced EIR. The Reclamation Board is identified in SAFCA's certified EIR as a responsible agency by virtue of its regulatory authority in granting levee and floodway encroachment permits.[2]

Section 8710 of the California Water Code provides:

> Every plan of reclamation, flood control, drainage, improvement, dredging or work, that includes or contemplates the construction, enlargement, revetment or alteration of any levee, embankment, canal or other excavation in the bed of or along or near the banks of the Sacramento or San Joaquin Rivers or any of their tributaries or connected therewith, or upon any land adjacent thereto, or within any of the overflow basins thereof, or upon any land susceptible to overflow therefrom, shall be approved by the board before construction is commenced.[3]

In response to a comment from Reclamation District 2035 regarding The State Reclamation Board's jurisdiction,[4] SAFCA responded,

> The Reclamation Board has approval authority over ***portions*** of the NLIP Landside Improvements Project. The NLIP Landside Improvements Project would not alter water surface elevations and therefore would not increase flooding potential in the SRFCP.[5]

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[1] It is not clear why SAFCA is not seeking a permit from The Reclamation Board for the Sacramento River East Levee Phase 1 Improvement Project (Reaches 1 through 4B).
[2] NLIP Landside Improvement DEIR, Sacramento Area Flood Control Agency (EDAW, Sept. 2007) p. 1-4.
[3] California Water Code, Section 8710
[4] NLIP Landside Improvements Project FEIR, SAFCA (EDAW, Nov. 2007), p. 3-68
[5] NLIP FEIR, p. 3-71.

We criticized SAFCA for segmenting the environmental review of its landside levee improvements.[6] It appears SAFCA is continuing to segment the review of its landside levee improvements by forwarding only a portion of the 2008 construction project that it approved on November 29, 2007, for review by The Reclamation Board. It would appear Section 8710 of the Water Code gives The State Reclamation Board complete jurisdiction over SAFCA's Natomas Levee Improvement Program.

As a responsible agency The Reclamation Board must comply with CEQA; specifically, the duties of a responsible agency described in section 15096 of the CEQA Guidelines. Additionally, as a responsible agency, an inadequate CEQA document is a legal basis for the Board of Reclamation to deny this application.[7]

SAFCA's EIR Failed to Compare Project Impacts Against Baseline Conditions

SAFCA's EIR has failed to evaluate the environmental consequences of its proposed levee improvement program against the existing baseline environmental conditions.[8] During the staff presentation of the proposed levee improvement project at the November 29, 2007 SAFCA hearing, Joseph D. Countryman, President of MBK Engineers explained the hydraulic modeling that was used in determining that SAFCA's project would not change the river's elevation. The attached diagram at Exhibit 2 entitled "Cross-section: Sacramento River at USGS River Mile 76.1 (looking downstream)," was used by Mr. Countryman to show graphically the assumptions that went into MBK's computer model. This Cross-section of the Sacramento River demonstrates that the East side levee is higher than the west (Yolo) side levee.[9] SAFCA's project increases the height of the east side levee to provide the necessary freeboard to meet the new FEMA standards. MBK's computer model assumes that the west side levee will be raised to the 40 foot elevation line (see the red cap on the west side levee). In other words, MBK's computer model is based on a hypothetical situation – that the levees on the Yolo County side of the River have already been raised beyond their actual height. However, CEQA requires the lead agency to compare the impacts of its proposed project against the existing environmental conditions, not a hypothetical situation.[10] The real, existing, on-the-ground condition is the actual height of the west side levee without the non-existent additional height as indicated on the diagram by the red cap. Furthermore, Mr. Countryman also testified that he had to input additional fictitious data into the model in order to get the results desired by SAFCA, specifically that the levees upstream of the Natomas levees are currently stronger than they actually are and that these levees would not fail prior to the existing Natomas levees, which he stated was not the actual case.

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[6] Exhibit 1, pp. 10-12.
[7] California Code of Regulations, Tit. 23, Div. 1, Ch. 1, Art. 3, §15, subd. (c).
[8] See Exhibit 1, pp. 8-10.
[9] At an October 19, 2007 Reclamation Board Hearing Mr. Countryman provided an overview of the Natomas Levee Project in which he stated: "The existing levee in Natomas is over 2 feet higher than the levee across the river on the west side of the Sacramento River." An excerpt from the transcript of the meeting is attached as Exhibit 3 to this letter. Mr. Countryman's quote is at p. 247, lines 5 through 7.
[10] *Save Our Peninsula Committee v. Monterey County Board of Supervisors* (2001) 87 Cal.App.4th 99, 121.

If you use baseline conditions and the design 200-year water surface for the Natomas Levee Improvement Program, you can see that the designed water surface elevation (the blue line labeled "200-yr NLIP Design WS (no failures)" is three to four feet higher than the west side levee. This means that the lands on the west side of the river are going to be flooded when the Sacramento River reaches the new 200-year designed elevation for the east side levee improvements. This would "expose people or structures to a significant risk of loss, injury or death involving flooding, including flooding as a result of the failure of a levee."[11]

SAFCA's Levee Improvement Project Jeopardizes Adjacent Jurisdictions and Properties

Reclamation District 1001 commented on SAFCA's DEIR pointing out that by raising the south levee along the Natomas Cross Canal SAFCA could be jeopardizing RD 1001's lower north levee and lands on the north side of the canal.[12] Several property owners also raised concerns about the impact raising the south levee would have on properties to the north protected by the lower south levee.[13]

Reclamation District 2035 submitted a comment letter on SAFCA's DEIR criticizing SAFCA's flood modeling and for protecting the Natomas Basin at the risk of flooding other areas.[14]

The Reclamation Board may deny a permit if the proposed work could jeopardize directly or indirectly the physical integrity of levees or other works, or increase the damaging effects of flood flows.[15] Comments by landowners and the two reclamation districts directly affected by SAFCA's proposed action raise serious concerns about the risk of flooding in other areas. It would appear that SAFCA is creating a "levee parity" problem for neighboring jurisdictions by raising its levees three feet higher than the levees on the opposite sides of the Cross Canal and the Sacramento River, thus making these areas more vulnerable to flooding. When discussing another proposed project with a levee raise of only one foot on the Sacramento River, your Chief Engineer recently stated publicly that the Board of Reclamation staff ". . .can't endorse such an improvement because it would create a "levee parity" problem." [16] The proposed SAFCA project would raise levees three feet on one side of the river, creating an even larger levee parity problem than the one cited by your Chief Engineer.

The members of our client organization who live on the riverside of the east side levee improvements are concerned that Yolo County will respond to SAFCA's project and will raise the west side levee. Then the blue line that represents the "200-yr NLIP Design [Water Surface]" will flood those homes on the riverside of the new improved levees. SAFCA's flood

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[11] CEQA Guidelines, Appendix G, Environmental Checklist, Sample Question, VII. Hydrology and Water Quality, Item (i).
[12] NLIP Landside Improvements Project FEIR, SAFCA, (EDAW, Nov. 2007), p. 3-56.
[13] NLIP FEIR, pp. 3-291, -293, & -311.
[14] *id.* at p. 3-60 through 3-62.
[15] California Code of Regulations, Tit. 23, Div. 1, Ch. 1, Art. 3, §15, subd. (a)(1) & (7).
[16] See Exhibit C (Sacramento Bee article entitled "Riverfront: Plans to extend walkways face large hurdles") attached to Exhibit 1. the November 27. 2007 letter from Bill Yeates to SAFCA Chair Heather Fargo.

modeling never addressed this situation, because it never evaluated the height of the residences on the west side of the levee.

SAFCA Failed to Evaluate An Alternative That Lowers The River's Elevation

Because SAFCA failed to evaluate the environmental effects of its project against existing baseline environmental conditions, SAFCA's environmental document has been severely skewed to favor its proposed project, at the expense of a comprehensive review of alternatives to the proposed project. Despite many comments by adjacent landowners and RD 2035, SAFCA never considered a feasible alternative to its project that would lower the elevation of the river at flood stage, rather than raise the height of the levees.[17] Comments suggested lowering the existing weirs or providing set back levees. Despite acknowledging that the existing levee system constricts the river causing "chronic erosion and seepage,"[18] SAFCA simply dismissed evaluating any alternative that would lower the elevation of the river by improving or expanding the use of the existing bypass system. Neither the public nor public decision-makers were given the opportunity to compare the effects of an alternative that lowered the height of the river to the proposed program SAFCA is promoting.

The Reclamation Board may also deny SAFCA's project based on the fact that SAFCA's EIR is inadequate.[19]

On behalf of the Garden Highway Community Association, we urge The Reclamation Board to deny SAFCA's application because the lead agency's EIR does not comply with CEQA and its levee improvement project will jeopardize other area levees, adjacent properties, structures, residents, and will, therefore, increase flood damage in these areas.

Sincerely,

//s//

Bill Yeates

cc: Client
Sheila Buer, Executive Director, SAFCA

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[17] See, e.g., NLIP FEIR, pp. 3-64, 3-134, 3-179, 3-208, 3-212, 3-218, 3-232, 3-257.
[18] NLIP DEIS, p. 3.4-4.
[19] California Code of Regulations, Tit. 23, Div. 1, Ch. 1, Art. 3, §15, subd. (c).

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John Bassett
Sacramento Area Flood Control Agency
1007 Seventh Street, 7th Floor
Sacramento, California 95814

Subject: Comments on the Sacramento Area Flood Control Agency's September 2007, Draft Environmental Impact Report on the Natomas Levee Improvement Program Landside Improvements Project

Dear Mr. Bassett:

The U.S. Fish and Wildlife Service (Service) and California Department of Fish and Game (DFG) (hereafter collectively referred to as the Wildlife Agencies) have reviewed the Sacramento Area Flood Control Agency's (SAFCA) September 2007, Draft Environmental Impact Report on the Natomas Levee Improvement Program Landside Improvements Project (DEIR). As described in the DEIR, the project objectives include: 1) complete the projects necessary to provide 100-year flood protection for developed areas in the major floodplains of the Sacramento metropolitan area (Sacramento) as quickly as possible, 2) provide urban-standard ("200-year") flood protection for developed areas in Sacramento's major floodplains over time, and 3) ensure that new development in the undeveloped areas of Sacramento's major floodplains does not substantially increase the expected damage of an uncontrolled flood.

As trustee for the State's fish and wildlife resources, the DFG has jurisdiction over the conservation, protection, and management of fish, wildlife, native plants, and habitat necessary for biologically sustainable populations of such species. In that capacity, the DFG administers the California Endangered Species Act (CESA), the Native Plant Protection Act (NPPA), and other provisions of the California Fish and Game Code that affords protection to the State's fish and wildlife trust resources. The DFG also considers issues as related to the Migratory Bird Treaty Act of 1918, as amended (16 U.S.C. 703-712) (MBTA). The Service is providing comments in accordance with the Endangered Species Act of 1973, as amended (16 U.S.C. 1531 *et seq.*) (ESA), and the MBTA.

As our discussion below further explains, the DEIR does not adequately address the impacts of the proposed project on fisheries and aquatic and terrestrial biological resources, or the Natomas Basin Habitat Conservation Plan's (NBHCP) Operating Conservation Program. In particular, the

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DEIR in some instances does not include mitigation measures that are enforceable, in some cases does not provide details and assurances for achieving successful mitigation, and defers mitigation details to some future time.

The effects analysis and proposed conservation strategy in the DEIR have not been evaluated by the Service to determine their consistency with Federal Endangered Species Act requirements. Such evaluation would occur during informal and formal consultation pursuant to section 7 of the ESA. At that time, the Service would use information provided by SAFCA and information otherwise available to the Service to determine the extent of effects to federally-listed species.

Background Information

The Wildlife Agencies met with representatives of SAFCA and its project consultant, EDAW, on September 25, 2006, May 10, 2007, and May 17, 2007, to discuss proposed levee improvement projects in the Natomas Basin and to discuss our concerns. In these meetings, the Wildlife Agencies emphasized the importance of minimizing the effects of SAFCA's proposed projects on federally and State listed species, as well as on existing and pending habitat conservation plans. The Wildlife Agencies also wrote a letter expressing the above concerns for the November 2006, Local Funding Mechanisms for Comprehensive Flood Control Improvements in the Sacramento Area Draft Environmental Impact Report. The DFG wrote a letter for the Notice of Preparation for the draft Environmental Impact Report for the Natomas Levee Improvement Program Landside Improvements Project expressing various concerns regarding potential impacts to biological resources. The Wildlife Agencies reiterate and expand upon their comments and concerns below.

Enforceable Mitigation Measures

CEQA Guidelines §§15126.4 (a)(1)(B) states that formulation of mitigation measures should not be deferred until some future time. Table ES-1 lists a number of mitigation measures for fisheries and aquatic resources (i.e. mitigation measures 3.6a and 3.6b), and terrestrial biological resources (i.e. mitigation measures 3.7a, 3.7b, 3.7c, 3.7d, 3.7f, 3.7h, and 3.7l), that rely on future approvals or agreements with the Wildlife Agencies, entities entrusted with carrying out the NBHCP's permit conditions (Natomas Basin Conservancy (TNBC)), and agencies entrusted with providing public safety (Federal Aviation Administration (FAA) approval over mitigation on proposed borrow site / Sacramento Airport buffer lands), as a means to bring identified significant environmental effects to below a level that is significant. In some cases (i.e. impact 3.7a on page 3.7-14), the DEIR states "specific requirements have not been established to ensure that appropriate habitat conditions have been provided to adequately replace the values that would be lost." Because there is no guarantee that these approvals or cooperation with all of the above entities will ultimately occur, the Wildlife Agencies believe that the above mitigation measures are unenforceable and do not bring the impacts to fisheries and aquatic resources to below a level that is significant.

Mitigation measures should establish performance standards to evaluate the success of the proposed mitigation, provide a range of options to achieve the performance standards, and must commit the lead agency to successful completion of the mitigation. Mitigation measures should

also describe when the mitigation measure will be implemented, and explain why the measure is feasible. Therefore, the Wildlife Agencies recommend that the mitigation measures described in sections 3.6 and 3.7, and summarized in Table ES-1, include measures that are enforceable and do not defer mitigation details to some future time. The DEIR should identify the following items: how each measure will be carried out; who will perform the measures; when the measures will be performed; and the performance standards and mechanisms for achieving success, and an assured source of funding to acquire and manage identified mitigation lands. The DEIR could describe a range of enforceable mitigation measures that will be implemented in instances where approval and cooperation with the entities identified above either does or does not occur. 1-2 (Cont.)

Potential Impacts on Federally- and State-Listed Species
The proposed activities described in the DEIR may result in adverse affects to several federally- and State-listed species, including the giant garter snake *(Thamnophis gigas;* GGS), and the Swainson's hawk *(Buteo swainsoni;* SWH).

GGS
The proposed activities described in the DEIR would result in impacts to upland and aquatic habitats for the GGS. Direct and indirect impacts could include the loss and displacement of individuals, the temporary disturbance of habitat, and road mortality. SAFCA states in the DEIR that "measures...shall be implemented to minimize the potential for direct injury or mortality of individual giant garter snakes during project construction. Such measures shall be finalized in consultation with DFG and USFWS, and are likely to include worker awareness training, timing of initial ground disturbance to correspond with the snake's active season...dewatering aquatic habitat before fill, conducting preconstruction surveys, and conducting biological monitoring during construction.". The effects analysis and proposed conservation strategy in the DEIR have not been evaluated by the Service to determine their consistency with Federal Endangered Species Act requirements. Such evaluation would occur during section 7 consultation.

According the Service's conservation measures for GGS, construction activities occurring within GGS habitat should be completed between May 1 and October 1. This is the active period for GGS, and the potential for direct mortality is lessened during this time because it is expected that the snake will actively move and avoid danger. Construction activities that extend beyond October 1 may adversely affect the GGS by limiting its ability to find and utilize suitable upland habitat for winter hibernation, by hindering its dispersal behavior, and by exposing it to increased risks of injury and mortality from predation, exposure, entombment, vehicular traffic, and construction equipment as the snake may be forced to disperse through and/or around the construction site in response to habitat changes and seasonal indicators. If it appears that construction may not be completed by October 1, additional conservation measures, including compensation, may be necessary to minimize these effects. The project proponent should contact the Service through a lead Federal agency no later than July 15 of the year in question to allow for adequate time to consider and process a request to extend the GGS work period construction window. The Service may consider this request, particularly if construction is at least 80 percent complete by October 1. 1-3

The DEIR also states "although the [GGS] habitat loss would be compensated for by habitat creation and preservation, a plan has not yet been prepared specifying how canals and marsh that are designed to provide giant garter snake habitat would be managed to ensure that the appropriate habitat conditions are provided", and "SAFCA shall develop and implement a plan to address management of aquatic (i.e., GGS/Drainage Canal and marsh/seasonal wetland habitat) and adjacent upland habitats that are created and rice fields that are preserved as part of the project in order to ensure that the performance standard of no net loss in function and value of giant garter snake habitat is met....the management plan for the giant garter snake habitat creation and preservation components of the project shall be reviewed and approved by USFWS and DFG before project implementation. Authorization for take of giant garter snake under ESA and CESA shall be obtained. All measures subsequently adopted through the permitting process shall be implemented." These commitments require more specificity and explanation in the DEIR in order to evaluate their adequacy and feasibility to protect the GGS and its habitat in the basin.

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SWH

The proposed activities described in the DEIR would result in impacts to nesting and foraging habitats for the SWH. Direct and indirect impacts could include the loss and displacement of individuals, the disturbance of habitat, and mortality. SAFCA states in the DEIR that "the primary engineering and construction contractors shall ensure, through coordination with a qualified biologist retained by SAFCA, that staging areas and access routes are designed to minimize disturbance of known Swainson's hawk nesting territories. The biologist shall conduct preconstruction surveys to identify active nests within 0.25 mile of construction areas, in accordance with DFG guidelines. Surveys shall be conducted in accordance with NBHCP requirements and Recommended Timing and Methodology for Swainson's Hawk Nesting Surveys in California's Central Valley (Swainson's Hawk Technical Advisory Committee 2000). If an active nest is found, an appropriate buffer that minimizes the potential for disturbance of the nest shall be determined by the biologist, in coordination with DFG. No project activities shall commence within the buffer area until a qualified biologist confirms that the nest is no longer active or the birds are not dependent on it. Monitoring shall be conducted by a qualified biologist to determine whether project activity results in detectable adverse effects on the nesting pair or their young. The size of the buffer may vary, depending on the nest location, nest stage, construction activity, and monitoring results. If implementation of the buffer becomes infeasible or construction activities result in an unanticipated nest disturbance, DFG shall be consulted to determine the appropriate course of action."

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The DFG believes that impacts to and take of SWH could occur by project related activities within ½ mile of an occupied SWH nest. In order to reduce impacts to a level below significance for nesting SWH, the DFG recommends that the DEIR commit SAFCA to undertake the minimization measures described in the DEIR and quoted in the preceding paragraph, and if construction activities are expected to occur within 0.5 miles of an occupied nest, SAFCA will consult with DFG and, if necessary, obtain an incidental take permit issued pursuant to Fish and Game Code section 2081.

For the SWH, SAFCA states in the DEIR that "SAFCA shall develop and implement a plan to

address management of grassland habitats that are created as part of the proposed project in order to ensure that the performance standard of no net loss of sensitive habitat is met. The management plan shall, at a minimum, establish specific success criteria for habitat creation, specify remedial measures to be undertaken if success criteria are not met (e.g., supplementary plantings and additional monitoring), and describe short- and long-term maintenance and management of the features. Long-term protection of the created features and funding for their management shall be provided through appropriate mechanisms to be determined by SAFCA, DFG, and other entities cooperating in implementation of the proposed project." These commitments require more specificity and explanation in the DEIR in order to evaluate their adequacy and feasibility to protect the SWH and its habitat in the basin.

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As described in "Enforceable Mitigation Measures" above, because there is no guarantee that approvals or agreements with TNBC, FAA, USFWS, and DFG (which are necessary to carrying out the mitigation measures described in the DEIR) will ultimately occur, the Wildlife Agencies believe that the above mitigation measures are unenforceable and do not bring the impacts to the GGS and SWH to below a level that is significant. Therefore, the Wildlife Agencies recommend that the mitigation measures described in sections 3.7d and 3.7f, and summarized in Table ES-1, include measures that are enforceable and do not defer mitigation details to some future time. The DEIR should identify: how the mitigation measures will be carried out; who will perform the measures; and when the measures will be performed. The DEIR should also identify measureable performance standards and mechanisms for achieving success, and describe an assured source of funding to establish and manage identified mitigation lands. The DEIR could describe a range of enforceable mitigation measures that will be implemented in instances where approval and cooperation with the above agencies and entities either does or does not occur. A mitigation plan for establishing habitat lands to offset the significant impacts to SWH foraging and nesting habitats and GGS aquatic and upland habitats should be developed in coordination with and subject to approval by the Wildlife Agencies. The plan should include a plan for establishing habitat and vegetation components, a monitoring plan (a minimum of 5 years), appropriate success criteria, and a remediation plan in the event that success criteria are not met. The mitigation plan should identify who will hold ownership of the parcel(s), who will manage the parcel(s), and what funding will be used to manage such lands in perpetuity.

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CESA

A California Endangered Species Act (CESA) Permit must be obtained if the project has the potential to result in take of species of plants or animals listed under CESA, either during construction, or over the life of the project. The proposed project may result in take of GGS and SWH. Issuance of a CESA permit is subject to CEQA documentation; therefore the CEQA document must specify impacts, mitigation measures, and a mitigation monitoring and reporting program. If the project will impact CESA listed species, early consultation is encouraged, as significant modification to the project and mitigation measures may be required in order to obtain a CESA permit. A CESA permit may only be obtained if the impacts of the authorized take of the species is minimized and fully mitigated and adequate funding has been ensured to implement the mitigation measures. The DFG may only issue a CESA permit if DFG determines that issuance of the permit does not jeopardize the continued existence of the species. The DFG

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will make this determination based on the best scientific information available, and shall include consideration of the species' capability to survive and reproduce, including the species known population trends and known threats to the species. Issuance of a CESA permit may take up to 180 days from receipt of an application from the applicant. Therefore, the DFG recommends that the DEIR also include a discussion of known threats to, and population trends of, GGS and SWH, and includes a mitigation monitoring and reporting program which at a minimum includes a range of enforceable mitigation measures, including identifying: how the measure will be carried out; who will perform these tasks; when the tasks will be performed; and provide details for achieving success, including funding to establish and manage identified mitigation lands.

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Potential Impacts on Burrowing Owl and other Special-Status Birds

According to the California Natural Diversity Database (CNDDB) and as described in the DEIR, burrowing owls (*Athene cunicularia; BUOW*) are known to occur within the project vicinity. Fish and Game Code section 3503.5 protects raptors, and their nests and eggs. The DEIR states that "the biologist shall conduct preconstruction surveys to identify active special-status bird nests and occupied BUOW burrows within 500 feet of construction areas. Surveys for nesting birds shall be conducted before project activities are initiated during the nesting season (March 1–July 31), and surveys for BUOW shall be conducted before project activities are initiated at any time of year. Surveys shall be conducted in accordance with NBHCP requirements. If an active nest or occupied nest burrow is found, an appropriate buffer that minimizes potential for disturbance of the nest shall be determined by the biologist, in coordination with DFG. No project activities shall commence within the buffer area until a qualified biologist confirms that the nest is no longer active or the birds are not dependent on it. Monitoring shall be conducted by a qualified biologist to ensure that project activity does not result in detectable adverse effects on the nesting pair or their young. The size of the buffer may vary, depending on the nest location, nest stage, construction activity, and monitoring results. If an occupied BUOW burrow that does not support an active nest is found, SAFCA shall develop and implement a relocation plan, in coordination with and subject to approval of DFG and USFWS and consistent with requirements of the NBHCP. Because the project would generally result in temporary disturbance of BUOW habitat or conversion from one suitable habitat type to another, relocation is likely to include passive exclusion (via one-way doors at the burrow entrances) of owls from the project site. The owls would then be able to reoccupy the area after construction is complete. Implementation of the above measure would ensure that destruction of occupied BUOW burrows and loss of active nests of this and additional special-status bird species are avoided."

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The mitigation measures described in the DEIR for the BUOW are not adequate to minimize impacts to a level below significance, because no permanently protected available suitable nesting habitat, no foraging habitat, and no long-term management and monitoring of the mitigation measures are provided. We recommend that the following mitigation measures should also be included in the DEIR (which are described in the Department of Fish and Game's (DFG) 1994 "Staff Report on Burrowing Owl Mitigation,"):

1. Occupied burrows should not be disturbed during the nesting season (February 1 through August 31) unless a qualified biologist approved by the Department verifies through non-

invasive methods that either: (1) the birds have not begun egg-laying and incubation; or (2) that juveniles from the occupied burrows are foraging independently and are capable of independent survival.

2. To offset the loss of foraging and burrow habitat on the project site, a minimum of 6.5acres of foraging habitat (calculated on a 100 m (approx. 300 ft.) foraging radius around the burrow) per pair or unpaired resident bird, should be acquired and permanently protected. The protected lands should be adjacent to occupied BUOW habitat and at a location acceptable to the Department. Protection of additional habitat acreage per pair or unpaired resident bird may be applicable in some instances.

3. When destruction of occupied burrows is unavoidable, existing unsuitable burrows should be enhanced (enlarged or cleared of debris) or new burrows created (by installing artificial burrows) at a ratio of 2:1 on the protected lands site

4. If owls must be moved away from the disturbance area, passive relocation techniques (as described below) should be used rather than trapping. At least one or more weeks will be necessary to accomplish this and allow the owls to acclimate to alternate burrows.

5. The project sponsor should provide funding for long-term management and monitoring of the protected lands. The monitoring plan should include success criteria, remedial measures, and an annual report to the Department.

Passive Relocation - With One-Way Doors: Owls should be excluded from burrows in the immediate impact zone and within a 50 meter (approx. 160 ft.) buffer zone by installing one-way doors in burrow entrances. One-way doors (e.g., modified dryer vents) should be left in place 48 hours to insure owls have left the burrow before excavation. Two natural or artificial burrows should be provided for each burrow in the project area that will be rendered biologically unsuitable. The project area should be monitored daily for one week to confirm owl use of burrows before excavating burrows in the immediate impact zone. Whenever possible, burrows should be excavated using hand tools and refilled to prevent reoccupation. Sections of flexible plastic pipe should be inserted into the tunnels during excavation to maintain an escape route for any animals inside the burrow.

1-7 (Cont.)

Passive Relocation - Without One-Way Doors: Two natural or artificial burrows should be provided for each burrow in the project area that will be rendered biologically unsuitable. The project area should be monitored daily until the owls have relocated to the new burrows. The formerly occupied burrows may then be excavated. Whenever possible, burrows should be excavated using hand tools and refilled to prevent reoccupation. Sections of flexible plastic pipe should be inserted into burrows during excavation to maintain an escape route for any animals inside the burrow.

Potential Impacts on Sensitive Plants

The DEIR describes that three special status plants species have potential to occur in aquatic

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habitats within the project area, including rose mallow (*Hibiscus lasiocarpus*), Delta tule pea (*Lathyrus jepsonii* var. *jepsonii*), and Sanford's arrowhead (*Sagittaria sanfordii*). The DEIR states that "the proposed project would result in permanent and temporary direct effects on irrigation/drainage ditches, canals, and reservoir that provide potentially suitable habitat for these species", and "fill and disturbance of these habitats could result in adverse effects on special-status plants, if present." As mitigation for these potential impacts, the DEIR states that "before any ground-disturbing project activities begin, a qualified biologist retained by SAFCA shall conduct surveys for special-status plants in appropriate habitat within the project footprint, in accordance with USFWS and/or DFG guidelines and at the appropriate time of year when the target species would be clearly identifiable. If no special-status plants are found during focused surveys, no further action shall be required", and "if special-status plants are found, areas of occupied habitat shall be identified and the primary engineering and construction contractors shall ensure, through coordination with the biologist, that staging areas and access routes are designed to minimize disturbance of these areas. All occupied habitat that is located adjacent to construction areas, but can be avoided, shall be protected by temporary fencing during construction. If special-status plants are present in areas that cannot be avoided, plants that would be affected shall be transplanted to the GGS/Drainage Canal, if feasible. If this is infeasible (i.e., because the created habitat is not suitable at the time transplantation is required), an alternative transplantation location (e.g., TNBC preserves), approved by USFWS and DFG, shall be utilized. A plan to address management of the transplanted populations and their habitat shall be developed."

1-8 (Cont.)

The DFG has found that transplanting many herbaceous plants is typically unsuccessful, and should be considered experimental. In order to bring the impacts identified above to below a level that is significant, the Wildlife Agencies recommend that the mitigation measures described in sections 3.7b, and summarized in Table ES-1, include a requirement that seasonally appropriate floristic surveys be conducted in areas of suitable habitat for sensitive plants in a manner consistent with the *Guidelines for Assessing the Effects of Proposed Projects on Rare, Threatened, and Endangered Plants and Natural Communities* (DFG 2000), provide a detailed justification for transplanting the above three plant species, and include additional measures to increase the chance of success, such as collecting and propagating seed in an approved nursery to provide additional plantings in an appropriate mitigation site, and performing transplantation actions when the plant is dormant. A mitigation plan approved by the DFG should be developed, which includes a planting plan, monitoring plan, success criteria, and a remediation plan in the event that success criteria are not met. Mitigation lands should be protected and managed in perpetuity.

Potential Impacts on the Natomas Basin Habitat Conservation Plan

While the Wildlife Agencies acknowledge that the proposed projects described in the DEIR are not urban developments, the proposed projects are likely to result in significant effects to listed species in the Natomas Basin as a result of habitat modification and disturbance, and are likely to adversely affect the implementation of the Natomas Basin Habitat Conservation Plan (NBHCP; City of Sacramento *et al.* 2003). The NBHCP's ITPs cover the take of 22 plant and animal species, many of which are listed as endangered or threatened under the California Endangered

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Species Act and/or the Federal Endangered Species Act.

The effectiveness of the NBHCP's Operating Conservation Program is explicitly premised upon the City of Sacramento's commitment to limit total development to 8,050 acres within the City's Permit Area, Sutter County's commitment to limit total development to 7,467 acres within Sutter County's Permit Area, and the expectation that total development within the basin would not exceed 17,500 acres. The proposed levee improvement project would result in disturbance or destruction of GGS and SWH habitat in the Natomas Basin above the level analyzed under the NBHCP and in particular, sensitive habitat areas for the species. Thus, the proposed action has the potential to impact the effectiveness of the NBHCP's conservation strategy designed to protect the GGS and SWH. On September 7, 2005, Judge Levi issued a decision in the Federal NBHCP litigation, which cautioned in footnote 13 of that decision that "the Service and those seeking an ITP in the future will face an uphill battle if they attempt to argue that additional development in the Basin beyond the 17,500 acres will not result in "jeopardy" to GGS and SWH. The ITPs issued to the Conservancy authorized the take of covered species associated with the restoration, enhancement, operation, and management of 7,758.5 acres of upland, managed marsh and rice preserves set aside as mitigation for the City's and Sutter County's development activities under the NBHCP. Approval of additional development in the Natomas Basin would likely make it more difficult for the Conservancy to fulfill its obligations under the NBHCP. Such development could result in isolation of the Conservancy's preserve lands, thus threatening the Conservancy's ability to implement the NBHCP's operating conservation program. 1-9 (Cont.)

SAFCA states in the DEIR that "SAFCA shall coordinate with TNBC to determine the most effective means of ensuring that the small encroachment onto reserves that would result from project implementation does not adversely affect the ability to meet the minimum-size and mitigation-ratio requirements of the NBHCP, require revision of existing management plans, and/or affect revenue-generation requirements. SAFCA shall, in coordination with TNBC, identify and implement necessary actions to ensure that encroachment does not jeopardize successful implementation of the NBHCP. Such actions may include direct supplementation of TNBC funding to offset losses in revenue generation, management of portions of the reserve that are encroached upon by project facilities in a manner that is consistent with current habitat requirements, and/or acquisition of additional land to replace portions of reserves that are encroached upon. Actions shall be approved by TNBC, USFWS, and DFG and shall be implemented by SAFCA before encroachment occurs." As described in the "Enforceable Mitigation Measures" section of this letter above, because there is no guarantee that approvals or agreements with TNBC, USFWS, and DFG will ultimately occur or even whether the proposed measures to minimize impacts to TNBC reserve lands are feasible, the Wildlife Agencies believe that the above mitigation measures are unenforceable and do not bring the impacts to the NBHCP's Operating Conservation Program to below a level that is significant. Therefore, the Wildlife Agencies recommend that the mitigation measures described in sections 3.7a-g and 3.7i, and summarized in Table ES-1, include measures which are enforceable and do not defer mitigation details to some future time. The DEIR could describe a range of enforceable, feasible mitigation measures that will be implemented in instances where approval and cooperation with

Mr. John Bassett

1-9 (Cont.)

hese other entities either does or does not occur.

Conclusion

Thank you for the opportunity to review this project. As the Wildlife Agencies have previously stated in person, we are concerned about the effects of the proposed project on federally- and state-listed species, and on the efficacy of the NBHCP and the existing ITPs. The DEIR does not adequately address the effects of the proposed project on the GGS, SWH, BUOW, and various sensitive plants in particular, and more generally, on the NBHCP's operating conservation program. We remain committed to working with SAFCA to ensure that the implementation of the proposed project avoids and minimizes effects on listed species and remains consistent with the conservation strategies and operating conservation programs of pending and existing habitat conservation plans.

1-10

Pursuant to Public Resources Code Sections 21092 and 21092.2, the DFG requests written notification of proposed actions and pending decisions regarding this project. Written notifications should be directed to the DFG Sacramento Valley/Central Sierra Region, 1701 Nimbus Road, Suite A, Rancho Cordova, California 95670. The Service also requests notification of any actions on the proposed project. Written notification can be submitted to the Service at the letterhead address.

Please contact Jana Milliken, the Acting Sacramento Valley Branch Chief, or Jennifer Hobbs, Staff Biologist, of the Service at (916) 414-6645, and Todd Gardner, Staff Environmental Scientist, at (209) 745-1968, or Jeff Drongesen, Senior Environmental Scientist, at (916) 358-2919, of the DFG if you have any questions or concerns regarding this letter.

Sincerely,

Susan K. Moore
Field Supervisor
U.S. Fish and Wildlife Service

for Kent Smith
Acting Regional Manager
California Department of Fish and Game

cc:
Larry Combs, Administrator, County of Sutter, Yuba City, CA
Roger Dickinson, Sacramento County Board of Supervisors, Sacramento, CA
Tom Buford, City of Sacramento, Sacramento, CA
John Roberts, The Natomas Basin Conservancy, Sacramento, CA
Jeff Drongesen, California Department of Fish and Game, Rancho Cordova, CA
Todd Gardner, California Department of Fish and Game, Rancho Cordova, CA

13

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SCOTT A. MORRIS

October 29, 2007

VIA E-MAIL (Email: BassettJ@SacCOunty.net)
and U.S. MAIL

Mr. John Bassett
Sacramento Area Flood Control Agency
1007 7th Street, 7th Floor
Sacramento, CA 95814

Re: Comments on SAFCA's Landside Improvements Project and Bank Protection Project Draft Environmental Impact Reports

Dear Mr. Bassett:

A. Introduction

This letter provides Reclamation District 2035's ("RD 2035") joint comments on both Draft Environmental Impact Reports for the Natomas Levee Improvement Program Bank Protection Project, SCH# 2007062017, ("Bank Project") and the related Natomas Levee Improvement Program Landside Improvements Project, SCH# 2007062016, ("Landside Project"). RD 2035 is providing a single response letter in light of the Sacramento Area Flood Control Agency's ("SAFCA's") decision to simultaneously release both DEIRs (i.e., the "Landside DEIR" and the "Bank DEIR") for public review. Both DEIRs involve different parts of the same project, which is part of one overarching program that was evaluated in SAFCA's Local Funding Mechanisms Program DEIR ("Programmatic DEIR"). RD 2035 intends that all the comments in this joint comment letter be submitted separately to each DEIR and responded to separately by SAFCA in both the Landside and Bank FEIRs.

B. Reclamation District 2035

Reclamation District 2035 ("RD 2035") was formed in 1919 to provide levee maintenance and drainage services to approximately 20,500 acres of land in Yolo County near the City of Woodland. RD 2035 is a local public entity that has legal authority and jurisdiction under Water Code Section 50000 et. seq to implement flood control programs and projects that reconstruct, replace, improve, or add to facilities as defined in Public Resources Code Section 5096.805(j). RD 2035's service

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area includes the Conaway Ranch property. The Conaway Ranch property covers over 17,000 acres on the west side of the Sacramento River between the cities of Davis and Woodland. Approximately 40 percent of the Ranch is located within the Yolo Bypass and the remainder lies west of the bypass. Both RD 2035 and the Conaway Preservation Group, LLC, which manages the Conaway Ranch, are actively involved in encouraging and seeking solutions to the region's flood problems while conserving open space, agriculture, and rural and environmental values.

C. SAFCA is Protecting Natomas at the Risk of Flooding Other Areas

SAFCA is attempting to proceed with levee improvements to only one side of the Sacramento River. While this approach may be more convenient for SAFCA, it represents a myopic focus on local benefits that is contrary to sound public policy and flood project planning for the entire region. SAFCA should acknowledge this short-sighted policy and admit that it creates an increased risk of flooding to lands on the opposite side of the Sacramento River and Natomas Cross Canal. Is it SAFCA's policy to increase flood risks to less urbanized or extra-jurisdictional areas in order to protect lands within its jurisdiction, like Natomas? What is SAFCA's view of its responsibility for the effects of its flood control activities on flood risk in other areas? 13-1

D. SAFCA is Using Improper Significance Thresholds to Analyze the Flood Threat to the Opposite Side of the River

The DEIRs significance criteria and conclusions based on them are improper. Given that the west side Sacramento River levees are already under great stress in flood events, any change to the hydraulics or river elevation should be considered significant. The catastrophic consequences of a levee failure on any stretch of the Sacramento River leave no room for further increases in river elevation. Thus, any increase in river elevation during floods is significant and should be the proper threshold used in the analysis, not 0.1 foot. What is the basis supporting the 0.1 foot threshold? 13-2

Regarding impacts to water surface elevations and freeboard, SAFCA's approach to using a different threshold of significance for levees within the SRFCP and those outside the SRFCP's protection is irrational. The threshold for impacts to flood risk should be the same for all levees. The choice of the "1957" design profile as the threshold for significant encroachment is not justifiable. The known flood threats using information after the 1986 and 1997 storm events, render the 1957 design profile outdated for use as a significance threshold.

If the 1957 design standard is an accurate threshold for significance, then SAFCA should be trying to achieve that standard along the Natomas levees – instead, SAFCA is pursuing a higher, more realistic standard for itself and judging its impacts on others using the outmoded standard. As SAFCA has stated,[1] the levees on the west side are already apparently below the freeboard

[1] At the public hearing before the SAFCA Board, Executive Director Stein Buer repeatedly maintained that the status quo (i.e., baseline) was that levees on the opposite side were already significantly shorter and weaker.

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standards that SAFCA is seeking for the east side levees. Thus, the west side levees already have a significant problem with freeboard encroachment using modern standards, not the outmoded 1957 design standard. Any further rise in water elevation makes this existing problem that much harder to solve and is a de facto significant impact, which SAFCA must recognize and mitigate. As SAFCA itself stated:

> These improvements could reduce the risk of overtopping and failure of these levees, thereby causing more water to be retained in the channels under rare flood conditions. This, in turn, could increase the potential for overtopping and failure elsewhere in the SRFCP system, either within the Sacramento metropolitan area or upstream or downstream of this area. (Landside DEIR at 3.4-6).

Regarding project impacts to river velocity and flow, the Bank DEIR states that "[s]ome slight increase in scour would result from the increased velocities that could result in surface erosion of exposed soils on the berm areas where vegetation was removed." (Bank DEIR pg. 7-7). But the Bank DEIR does not discuss the increase in elevation or water velocity caused by adding fill to the waterside banks of the levees as depicted in its Figures 5-1 and 5-2. Table 4-1 indicates that proposed bank protections from only next year's construction will involve almost 9,000 linear feet with an average width of 65 feet. (Bank DEIR pg. 4-3). What is the total cubic volume of fill that SAFCA intends to add to the Sacramento River next year and for all the remaining Natomas levee improvements? How did SAFCA quantitatively calculate the effects of all this additional fill within the levees? 13-2 (Cont.)

Without quantitative analyses of the effects on the river (e.g., velocity, height, etc. ...) of the fill, there is no justification for concluding the effects are less than significant. In light of the previously discussed stress that west side levees are already under during flood events, and the deficiencies of those levees assumed under SAFCA's baseline, any increase in scouring, erosion, or water elevation to the west side levees must be considered significant and must be mitigated.

E. SAFCA's Flood Modeling Should Include More Details

Several issues with regard to modeling require comment. First, it appears the baseline model run indicated that the Natomas levees would not overtop or fail at their current heights. In fact, this result is what SAFCA uses to justify its conclusion that there will be no impacts to the opposite side of the river, namely that the Natomas levees are stronger and higher already. But, as explained above, this baseline result weakens any need to implement the projects quickly. The model indicates that current infrastructure in Natomas is safe from the 100-year flood. Therefore, there is 13-3

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no reason to rush to invest hundreds of millions of dollars in the current flood control system when it is admittedly outdated and designed to solve problems that no longer occur (i.e., siltation).[2]

SAFCA should clarify that the main impetus for quick implementation of these projects is to avoid the FEMA remapping process that would occur. If alternatively, there is a real, physical 100-year flood threat to Natomas that must be repaired, then SAFCA's chosen modeling assumptions or methods are improper and inaccurate because the model does not accurately reflect that situation.

Please provide more specific information regarding the modeling methods. Please provide specific evidence of the exact location of Sacramento River levee failures (both west and east side) and/or overtopping for all model runs or scenarios for all three DEIRs. Please also explain the reason why the model indicates these levees failed. Please explain if the model indicates any east side Sacramento River levees would fail under any modeled scenarios and why they failed. If none failed, why not?

13-3 (Cont.)

In regards to Section D's discussion of significance criteria, please explain how accurate and precise the UNET model used in this analysis is in detecting slight river elevation changes, or other metrics like river velocity and erosion or scouring potential. What is the confidence interval surrounding the model's results? What statistical methods were employed to assess the model's results? Were multiple model runs performed and the average taken? If so, what are the standard deviations around the averages? If no such information is available, then how can SAFCA rely on an abstract model to claim that the flood risk on the other side of the river will not be increased?

F. SAFCA Must Evaluate the Threat of Underseepage and Overall Levee Stability

The modeling in the DEIRs does not appear to analyze the threat of underseepage or levee instability. Did SAFCA analyze these threats in the UNET modeling or through other quantitative analyses of the flood risk its improvements would have to levees on the opposite side? If not, then SAFCA cannot assert that its projects will not affect the flood risk to the opposite levees.

13-4

The current modeling appears to indicate that the Natomas levees are already high enough to withstand the 100-year and 200-year flood threat because there is no overtopping. The urgency with which SAFCA is proceeding, however, suggests that the true concern may be levee underseepage and stability. If the UNET model did not model these factors, then it cannot be used to conclude that the baseline conditions of the Natomas levees are superior to the levees on the opposite side. What other information do the DEIRs contain to inform the public and decision makers of the superiority of the Natomas levees with regards to underseepage and stability. Without such information, SAFCA cannot support its baseline premise that the Natomas levees are

[2] At the public hearing on these EIRs, Executive Director Stein Buer explained that erosion of the Sacramento River bed, and not siltation, is the current condition.

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already stronger than the opposite side's and that the opposite side levees will fail first with or without the propsoed project(s).

The Natomas Levee Evaluation Report (prepared in 2006 for SAFCA by MBK Engineers and others) contains information about the composition and stability of the east side levees based on borings, but no comparable west-side levee data is provided. Please provide details of the stability and underseepage risk of the Natomas levees versus those across the Sacramento River to support the baseline premise that the current state of the Natomas levees has already shifted all of the flood risk to the other side. Were any borings or modeling of the sort done for the east side levees performed for the west-side levees? If so, please provide the information to prove that the stability and underseepage risk on the west-side levees is already materially greater than the east-side levees. We believe that this data is available from the Reclamation Board or the Army Corps of Engineers.

This issue is critically needed to assess the true increased flood risk that SAFCA's project creates for the opposite side. For instance, assume that levees on both sides of the river have an equal chance of failure and that one levee break must occur somewhere in that stretch of river during a 100-year flood to release pressure. Under this baseline each side effectively has a 50% chance of being flooded. If, however, one side then removes the chance of levee failure on its side, the other side is guaranteed to flood. The 50% risk of flooding on that side has been increased to 100% by the other side's actions. This oversimplified example shows the effects on flood risk that SAFCA's projects may have. SAFCA has presented no substantial evidence to support its premise that the east-side levees will not fail before the west-side levees as a result of underseepage and levee instability. Please provide such information or discuss the added flood risk to the opposite side of the river. 13-4 (Cont.)

In sum, RD 2035 believes that SAFCA's baseline premise that Natomas area levees are already stronger than levees on the opposite side is unsupported in the DEIRs. Therefore, SAFCA's improvements may demonstrably increase the potential for a catastrophic levee break on the opposite side of the river, which may affect RD 2035 lands. This would be a significant impact under CEQA, for which SAFCA must provide mitigation.

G. SAFCA's Objective to Provide 100-year Flood Protection "As Quickly As Possible" Unnecessarily Forecloses the Development of Better Alternatives

The insertion of a time factor into the program and project objectives is not needed because SAFCA's own modeling in all three DEIRs did not indicate that the Natomas Basin levees would be overtopped or fail – even at the 200-year flood level. If this is true, the area already has 100-year flood protection by SAFCA's estimation and there should be no rush to spend large sums of money on a physical solution without an apparent physical problem. What does SAFCA mean by the 100-year flood protection it seeks to achieve as soon as possible? 13-5

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If SAFCA's real objective is to achieve FEMA 100-year certification as quickly as possible, then SAFCA must explain why FEMA 100-year certification is so critical given that its own modeling shows that the levees are currently strong enough to physically protect the Natomas Basin from a 100-year flood. Furthermore, the objective should be changed to more accurately state this. In this context FEMA 100-year protection appears to be merely an administrative determination that is separate from the physical threat evaluated and disclosed by the modeling. Which is the proper standard? Is it the FEMA determination or SAFCA's modeling?

13-5 (Cont

The above issues present a logical disconnect in the DEIRs' explanation of why the project(s) is/are needed and what hydraulic effects they will have. As discussed in Section F, it appears SAFCA maintains that under baseline conditions its levees are already stronger than levees across the Sacramento River so that those levees would fail before the Natomas levees, thus reducing pressure on the Natomas levees even without the projects. But if this is the case, then the urgent need for these projects is obviated. SAFCA's own modeling, therefore, fails to disclose the urgent need for increased flood protection. Without this urgent need, SAFCA has more time to develop and discuss alternatives that will provide a comprehensive solution, as discussed in Section H. If this is not so, then SAFCA must explain the disconnect. RD 2035 suspects this is because, as discussed in Section F, levee stability and underseepage were not included in the modeling or any other quantitative analyses – a true failure of the DEIRs.

H. SAFCA Should Pursue A More Integrated and Comprehensive Flood Solution

Even with the proposed levee improvements, the threat of flooding in the Natomas Basin will remain, and the residents of the Sacramento region and the State of California will have to continue to periodically invest huge sums of money to support the levees and maintain SAFCA's project. The Programmatic DEIR explained that the current flood control system "although well suited to address the technical and financial challenges of a previous era, has left a succeeding generation of flood managers with two systemic problems and levee risk factors: chronic erosion and seepage." (Programmatic DEIR at 4.4-6). It also indicates that because "many segments of the mainstream levee system were constructed using relatively porous hydraulic mining sediments borrowed from the river channel, the levees have a propensity to seep when subjected to prolonged high water surface elevations." (*Id.*). The Bank DEIR concludes that:

13-6

> Over the long term, it is likely that additional bank protection will be needed in the region because the design of the SRFCP is expected to continue to induce erosion of unprotected banks and result in the loss of riparian vegetation. (Bank DEIR at 2-7).

The fact is that the Sacramento River levees are too narrow in many places. As explained in the quote above, the current configuration creates excessive erosion that requires constant monitoring and maintenance. Over time, this constant activity will further degrade the environmental, aesthetic, and recreational values of the Sacramento River. The DEIRs do not adequately discuss,

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analyze, or seek to avoid this problem. Quite the opposite, the Programmatic DEIR simply states that "by the mid-1950's it was agreed that bank protection would be a permanent capital cost of operating the SRFCP." (*Id.*). However, in the 1950's agencies did not have to comply with CEQA or consider alternatives. In 2007, CEQA requires that SAFGA consider longer lasting solutions to the flood situation and long-term impacts of its actions. The scanty selection of alternatives provided are not sufficiently innovative and are discounted too quickly without a real analysis of their comparative merits when compared to the long term environmental effects the chosen course of action commits to.

Instead of rushing to grab the low hanging fruit of continued fortification of the existing levee system to avoid being mapped a floodplain by FEMA for a few years, SAFCA should foster discussions and consideration of more comprehensive, overarching solutions to regional flood problems. RD 2035 stands ready to assist in this effort. While a comprehensive solution might take a few more years to develop, it would provide permanent and more effective flood control for the Natomas Basin and the region that would not need continued input of expensive construction and maintenance, which would also continually cause environmental impacts that CEQA requires a discussion of. Such a solution would provide a more dynamic, living river system that would provide lasting and greater environmental, recreational, and aesthetic benefits. CEQA requires that the public and decision-makers be presented with sufficient information about long-term environmental effects and potential alternatives before committing themselves to a long-term path that may foreclose other more viable paths. 13-6 (Cont.)

Whether a comprehensive solution would include setting back existing levees, redesigning the Yolo Bypass, purchasing or creating additional flood storage in reservoirs, developing additional designated flood plains or temporary flood storage locations, or other solutions is up to SAFCA. Citing institutional hurdles is not a sufficient excuse that justifies avoiding these issues because there is currently a great deal of political momentum behind a comprehensive solution to flood issues. The recent passage, among other things, of SB 5, SB 17, AB 70, AB 162, and AB 156 are new events substantially changing the circumstances under which SAFCA is proposing its projects. These changed circumstances provide added incentive to pursue a broader solution and render any reliance on the Programmatic DEIR's alternatives discussion obsolete and inadequate under CEQA Guidelines section 15162. For instance, the Legislature has directed the Department of Water Resources to provide system-wide evaluations and recommended flood control measures in a few years. SAFCA should cooperate with DWR in this effort instead of going forward with its project. The DEIRs should be revised to discuss these issues and the potential for the current approach to foreclose better, long-term solutions that would allow the Sacramento River to remain a valuable environmental, aesthetic, and recreational resource and will require less frequent infusions of costly construction activities.

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I. SAFCA's Piecemeal Approach to the DEIRs Is Improper, Inconsistent, and Confusing

The division of the environmental review process into numerous DEIRs, both now and apparently in the future, is confusing and fails to disclose the true environmental effects of the overall program. The Landside and Bank projects, and all future SAFCA actions on the Natomas levees, are all parts of the same project because they are all collectively required to satisfy the project objectives and prevent FEMA from mapping the Natomas basin as a major flood zone. Improving only half the length of the east Sacramento River levees will not achieve the project objectives and would not be an action with independent utility unrelated to the other contemplated actions. CEQA requires an impact analysis of the "whole of the project," not chopping the project into smaller segments, each with a minor effect on the environment, but this is what SAFCA is doing.

By separating the Landside and Bank projects from one another and preparing two separate DEIRs, SAFCA has created a confusing muddle of documentation that is hard to follow and sometimes inconsistent. More importantly, by dividing the program into so many parts, each DEIR is able to address a smaller impact than the true impacts of the project. For instance, the impact to biological resources of the Landside project is distinct from that in the Bank project, but they should be considered together. The same is true of impacts to agricultural land that will be used to obtain the fill and raw materials for the levee fixes. Similarly, the impacts of future phases of both projects are not adequately discussed here. Why were the Bank DEIR and Landside DEIR not part of the same DEIR?[3] 13-7

SAFCA should develop a detailed description of all the levee improvements it intends to make, and which are required to achieve the project objectives of attaining (or maintaining) 100-year FEMA certification. Then, one EIR should evaluate the specific impacts to various resources that will occur as a result of the whole of those actions, which represents the single project's true environmental impact. Responding to this comment by pointing to the cumulative effects analysis in both DEIRs is not adequate because that analysis is intended to more generally analyze the effects of other reasonably foreseeable projects, not other parts of the same project. Citing the Programmatic DEIR is also inadequate because it did not provide sufficient detail of the various project components to adequately assess project-level impacts. That modeling also included revised Folsom Dam operations that are not yet possible because, to our knowledge, the revised spillway has not been completed.

While evaluations in the Programmatic DEIR may be appropriate for analyzing various parts of a program, there is a limit to how finely a lead agency may segment a program. Here, SAFCA has gone too far because it is not separately analyzing two different projects under the same program,

[3] The simultaneous release and circulation of both DEIRs indicates that both could have been combined into a single document, which would be easier for the public and the decision makers to review and would provide a better picture of the true impacts of the levee improvements SAFCA proposes.

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but rather two parts of the same project, and SAFCA has plans to do more of the same.[4] As stated, this shrouds the true impacts of the project, presents a confusing assembly of CEQA documents, and prevents a real evaluation of the merits of the proposed project versus alternatives.

13-7 (Cont.)

J. SAFCA's No-Project Alternatives are Inconsistent

Both the Landside and Bank DEIR correctly state that an EIR "must evaluate a 'no-project' alternative, which represents 'what would be reasonably expected to occur in the foreseeable future if the project were not approved, based on current plans and consistent with available infrastructure and community services.'" (Landside DEIR at 11-1, Bank DEIR 6-1). Oddly, however, the EIRs present different pictures of what would reasonably occur in the no-project alternative. Because both projects are related parts of the overall program, and SAFCA maintains each is required to provide adequate flood protection to Natomas, the no-project alternative in each should be the same. In contrast, the current no-project alternatives appear to present artificial assumptions instead of explaining the reasonably foreseeable actions that would occur in the absence of the contemplated projects.

Alternative 1 of the Bank DEIR indicates that "[w]hile future federal/state action is the most likely scenario if SAFCA did not implement bank protection, the No-Project Alternative is defined as no bank protection being implemented at the nine sites." (Bank DEIR at 11-5). Thus, it appears that instead of presenting the reasonably foreseeable consequences of not implementing the project (i.e., Federal/State action) SAFCA created an improper and artificial no-project alternative precluding these likely actions and mimicking the project baseline.

13-8

Confusingly, in Alternative 4 of the Landside DEIR, SAFCA presents a different no-project alternative than it presented in the Bank DEIR. The Landside DEIR no-project alternative does not even mention the possibility of other Federal/State actions. The Landside DEIR also presents different future actions and consequences than the Bank DEIR's no-project alternative. The Landside DEIR states:

> Federal Floodplain regulations would prevent the Natomas Basin from absorbing new development as currently anticipated in the regional blueprint for future (2030) growth adopted by the Sacramento Area Council of Governments [cite]. As a result, up to 60,000 dwelling units and associated commercial and industrial developments may be redirected to other areas in the region over the next 2 decades. (Landside DEIR at 6-14).

[4] At the October 19, 2007 public hearing on this issue, SAFCA's general counsel indicated that supplemental or subsequent EIRs would be prepared for levee improvements for the next 6 miles of levee improvements slated for 2009, and then a similar process would again be followed for improvements intended in 2010. Such year-to-year CEQA review of the same project is improper.

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The Programmatic DEIR presented a similar no-project discussion. (Programmatic DEIR at 7-4). The three no-project alternatives should all be the same. They should provide the public and decision-makers with SAFCA's best analyses of what will occur in the absence of the projects and the overall program because they are all one inter-related part of the whole. 13-8 (Cont.)

K. SAFCA Requires Reclamation Board Approval

Lastly, SAFCA's projects will require approval by the Reclamation Board. It appears that under Water Code section 8710, SAFCA will require approval from the Reclamation Board before construction is commenced. Furthermore, under Water Code section 8722, the Reclamation Board may change the plans or specifications for work undertaken at any time upon its own initiative. How will this process fit with SAFCA's intended schedule of rapid implementation? 13-9

Conclusion

In sum, RD 2035 remains interested in working with SAFCA to resolve regional flood control issues and to develop comprehensive flood protection for the region. RD 2035 also supports flood protection for urbanized areas such as Natomas, but not without assurances that such actions will not affect the current and future flood risks to RD 2035, or some other measures or mitigation to offset this increased risk. The DEIRs do not presently provide sufficient information for RD 2035 to determine the effects of SAFCA's proposed project(s) on the flood risks to the opposite side of the Sacramento River or Natomas Cross Canal. SAFCA's analyses and approach in the DEIRs also create other inconsistencies that make the analyses incomplete or difficult to understand. 13-10

RD 2035 appreciates the opportunity to comment on the DEIRs, and will gladly work with SAFCA to resolve the issues raised in these comments. If more clarification or other information is needed regarding these comments, please contact me at (916) 321-4500.

As a public agency, RD 2035 looks forward to receiving your official responses at least 10 days prior to certification of the EIRs.

Very truly yours,

KRONICK, MOSKOVITZ, TIEDEMANN & GIRARD

Scott A. Morris

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Counsel for Reclamation District 2035

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O5-1 Comment noted; see Responses to Comments O5-2 through O5-11.

O5-2 Chapter 4.0, "Environmental Consequences and Mitigation Measures," in the Phase 3 DEIS/DEIR provides a description of the approach to the environmental analysis, followed by an analysis of the significant environmental impacts of the alternatives under consideration, including the Proposed Action. The comment provides no specific page citations or examples upon which to respond. Absent specific facts it is impossible to respond to this comment meaningfully. See also Response to Comment O4-2 regarding the urgency of reducing the flood risk in the Natomas Basin.

O5-3 USACE and SAFCA acknowledge that the commenter has attached five previous comment letters to this comment letter (O5). These documents are in the record and have been considered by USACE and SAFCA in their decision-making. Responses to the comments in these attached letters have been provided previously, as described below; therefore, new responses are not provided to these attached comments letters in this FEIR.

- Garden Highway Community Association letter to USACE dated July 24, 2008: USACE provided responses to this comment letter (I11) in the Phase 2 FEIS (USACE 2008).
- Garden Highway Community Association letter to SAFCA dated November 27, 2007: SAFCA received this letter after the close of the public and agency review period for the Phase 2 EIR; however, its contents were considered during SAFCA's decision-making on the Phase 2 Project. USACE and SAFCA provided responses to this comment letter in the Phase 2 FEIS (USACE 2008) because it was attached to the Garden Highway Community Association's July 24, 2008 letter to USACE and because written responses had not been previously provided.
- Garden Highway Community Association letter to the State Reclamation Board dated December 19, 2007: USACE received this comment letter during project scoping for the Phase 2 Project and considered its contents during preparation of the Phase 2 EIS. USACE and SAFCA provided responses to this comment letter in the Phase 2 FEIS (USACE 2008) because it was attached to the Garden Highway Community Association's July 24, 2008 letter to USACE and because written responses had not been previously provided.
- USFWS and DFG letter to SAFCA dated October 26, 2007: SAFCA provided responses to this comment letter (1) in the Phase 2 FEIR (SAFCA 2007b).
- RD 2035 letter to SAFCA dated October 29, 2007: SAFCA provided responses to this comment letter (13) in the Phase 2 FEIR (SAFCA 2007b).

O5-4 USACE has reviewed these project modifications and evaluated whether or not they warrant the preparation and circulation of a supplemental EIS, which is required if any of the following conditions occur: (i) the agency makes substantial changes in the proposed action that are relevant to environmental concerns; or (ii) there are significant new circumstances or information relevant to environmental concerns and bearing on the proposed action or its impacts (40 Code of Federal Regulations [CFR] Section 1502.9[c][1]). Based on USACE's independent evaluation, the Phase

2 Project modifications were not considered to be substantial changes under 40 CFR 1502.9(c)(1)(i) or significant new circumstances or information under 40 CFR 1502.9(c)(1)(ii) as compared to the Phase 2 Project analyzed in the Phase 2 EIS and USACE therefore determined that recirculation of the EIS is not required.

O5-5 While the lead agency is ultimately responsible for the adequacy and objectivity of the Draft and Final EIR under CEQA, including the scope, content, and impact conclusions, a Draft and Final EIR may be prepared by lead agency staff, another public or private entity, the project applicant or project applicant's consultant, or a combination of these parties (see California PRC 21165(a)). Additionally, the lead agency may rely on another lead agency's EIR and use the previously prepared EIR as its own (State CEQA Guidelines Section 15084[d]). The preparation of an EIR is a difficult task that is sometimes beyond the expertise or time constraints of an agency's own staff. Consequently, many lead agencies rely on private consultants to prepare EIRs.

When a project that is subject to CEQA requires a Federal discretionary permit, entitlement, authorization, or Federal funding; or occurs on Federal land, NEPA also applies. CEQA and NEPA establish similar processes. When a project is subject to both CEQA and NEPA, state and local agencies are encouraged to cooperate with Federal agencies to the fullest extent possible, through such measures as joint planning, research, hearings and joint preparation of environmental documents (State CEQA Guidelines Sections 15222 and 15226).

See also Response to Comment O5-10 regarding independent review of the Phase 3 DEIS/DEIR.

O5-6 The *Natomas Levee Improvement Program Update, November 17, 2008* (SAFCA 2008) refers to changes in the estimated total cost to achieve 100-year and "200-year" levels of flood risk reduction. Funds for the implementation of the Phase 3 Project, which is one of several phases of the Landside Improvements Project under the NLIP, are available from Proposition 1E funding that has already been designated for SAFCA's flood risk reduction projects, as well as assessments from SAFCA's Consolidated Capital Assessment District and potential funds from SAFCA's Development Impact Fee Program.

The cost of implementing the mitigation measures is included in the total cost of the Phase 3 Project. If there was insufficient funding to award contracts for construction of the Phase 3 Project, it would not be built and the impacts that have been identified as requiring mitigation would not occur.

O5-7 See Master Response: 24/7 Cutoff Wall Construction.

O5-8 See Response to Comment O2-5.

O5-9 See Master Response: Sacramento River East Levee Prism.

O5-10 See Table ES-2, in the Phase 3 DEIS/DEIR for a summary comparison of the effects of the alternatives considered. USACE and SAFCA will weigh the significant and unavoidable impacts of the Proposed Action with the project's benefits when determining whether to approve or deny the project. See also Response to Comment O2-12 regarding findings.

As suggested by the commenter, expert peer reviews are being completed for the NLIP. There is an independent Board of Senior Consultants that reviews the engineering and design aspects of the project. This Board ensures that any identified levee deficiencies are handled appropriately and that remedial measures selected to address deficiencies are appropriately designed. In addition, MWH, an engineering firm, is under contract to the City of Sacramento to review the NLIP. Furthermore, the NEPA and CEQA environmental review processes for the project involve

technical experts reviewing and analyzing the potential environmental effects of the project. See State CEQA Guidelines Section 15084(d) regarding preparation of an EIR. Finally, the lead agency is ultimately responsible for the adequacy of the environmental documents, including the scope, content, and impact conclusions. Therefore, all Phase 3 DEIS/DEIR documentation for the project is reviewed and approved by USACE and SAFCA, respectively.

O5-11 The potential effects of the construction of cutoff walls on domestic wells on both sides of the existing Sacramento River east levee are addressed in Impact 4.4-c, "Effects on Groundwater," in the Phase 3 DEIS/DEIR. The analysis by LSCE (see Appendix B2 of the Phase 3 DEIS/DEIR) found that the predicted effect of cutoff walls on the water side of the existing levee would be negligible (less than 1 inch) at low stage, and there would be a slight increase in groundwater levels (less than 1 foot) at high stage. This analysis is based on modeling by Kleinfelder (see Appendix B3 of the Phase 3 DEIS/DEIR) that assumed that cutoff walls would be installed along approximately 42,000 feet of the 96,000 feet of levee in Reaches 1–20B of the Sacramento River east levee. These slight groundwater changes would have no effect on the ability of waterside wells to pump water, nor would they affect the quality of groundwater at the depths from which these wells are pumped. It should be noted that water side wells along the Sacramento River east levee are located directly adjacent to the main source of recharge on the west side of the Natomas Basin, the Sacramento River. The proposed cutoff walls would be located landward of these wells, not between these wells and their primary source of recharge.

I1

From: capitolhack@netscape.net [mailto:capitolhack@netscape.net]
Sent: Thursday, February 26, 2009 2:44 PM
To: jdavis@gualco.com
Cc: mgt@timmermanco.com; info@safca.org
Subject: Re: From Dan Pellissier

Since the neighbors in Reach 7 have a unique interest in the proposed Reach 7 borrow pit, I think it is best to have a separate briefing where those specific issues can be addressed on-site and in detail. Prior to the briefing, a copy of any and all materials that SAFCA has that describes the NLIP's use and mitigation plans for the Reach 7 borrow pit would be useful, including any contracts with the land owner(s) and any studies, materials and communications used to characterize the site and prepare its Surface Mining and Reclamation Act permit (CA PRC 2710). This request for public records is being submitted in accordance with CA GC 6250 et al. I1-1

Thank you for your help.

Dan Pellissier
7021 Garden Highway
Sacramento, CA 95837

-----Original Message-----
From: Jay Davis <jdavis@gualco.com>
To: capitolhack@netscape.net
Cc: mgt@timmermanco.com
Sent: Thu, 26 Feb 2009 1:35 pm
Subject: FW: From Dan Pellissier

Hi Dan:

I do not have a SAFCA engineer available this Saturday. I have asked appropriate staff to forward me dates for the next two weeks of when they anticipate being in the field early in the morning or late afternoon so that we can find a mutually acceptable date/time. I should have those soon to forward to you. Alternatively, we can explore looking at scheduling a meeting at SAFCA (downtown) during the lunch hour or a telephone call as well. Also, SAFCA representatives will be presenting at a Natomas Town Hall on March 11, which starts at 5:30pm at the South Natomas Community Center, where they will be available.

Regards,

Jay Davis
Gualco Consulting
11230 Gold Express Dr. #310
Gold River, CA 95670
(916) 351-0600 tele
(916) 351-9392 fax
jdavis@gualco.com

Begin forwarded message:
From: capitolhack@netscape.net
Date: February 24, 2009 12:45:38 PM PST
To: JayDavis@aim.com, "[jdavis"@gualco.com][jdavis@gualco.com]
Cc: mgt@timmermanco.com
Subject: From Dan Pellissier

Please use this, my private email account, for future communications.

I spoke with my next door neighbor (7011) Mark Timmerman about the draft EIR and he would like to attend the on-site briefing. We are both available this Saturday, February 28 from 9:am to 4:pm. Please let me know if you can schedule the SAFCA representatives at this time.

Thank you for your help.

Dan Pellissier

Letter I1 Response	Dan Pellissier February 26, 2009

I1-1 This is not a comment on the Phase 3 DEIS/DEIR. USACE and SAFCA are committed to maintaining good communications with potentially affected residents and business owners throughout project planning and construction. See also Chapter 2.0, "Changes to the Phase 3 Project and Master Responses to Comments on the DEIS/DEIR," of this FEIR for identification of borrow sites within the Elkhorn Borrow Area.

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I2

From: David Lichman <David@DavidLichman.com>
Date: Thu, 26 Feb 2009 11:24:31 -0800
To: Jay Davis <jdavis@gualco.com>
Cc: John Bassett <bassettj@SacCounty.NET>, Barbara Gualco <bgualco@gualco.com>, Zarah Wyly <zarah@sactree.com>, Nancy Lichman <nlichman@aol.com>, "Nagy, Meegan G SPK" <Meegan.G.Nagy@usace.army.mil>, "Turner, Claire Marie SPK" <Claire.Marie.Turner@usace.army.mil>, "Holland, Elizabeth G SPK" <Elizabeth.G.Holland@usace.army.mil>
Subject: Phase 3 NLIP

Hi Jay,

We received the notice on the DEIS/DEIR. We would like to reiterate our comments from our last exchange, to make sure that they are included, and I would appreciate some additional information from you.

1) I looked at the diagrams in the DEIS/DEIR. When you visited, you indicated that no land-side slope changes would be required south of the pumping station on the NEMDC levee. I did not see any diagrams or information indicating that. As you know, this would impact our property directly. Can you point me to where this is documented, or let me know how to make sure that it gets done? I2-1

2) We did not ever get a clear indication that removal of the trees was important to the integrity of the levee. In fact, we found documentation on the SAFCA web site to the contrary. I have again included that reference, and also a letter from Elizabeth Holland, which indicates that the Corps is doing studies, but no results are in. I would suggest that the trees remain until those studies are complete, and would like your advice as to how to best prevent them from being removed before it is proven that it is required for stability. I2-2

It is my understanding that more recent studies have shown that the removal of mature trees increases seepage risk, because the dead roots eventually decay. I would like to make sure that everyone has all the facts.

3) As far as right of way, I would like to request another visit, so we can look at the trees behind our property, to see if we can find some way to preserve these heritage oaks and still provide sufficient access. I would also be interested to look at the fence line at that time, to see if any of my facility will be taken. I2-3

These are protected heritage oak trees, and we would like to make sure that they are given the special attention they deserve, and not just clear cut along with everything else along he levee. I2-4

Thanks

David Lichman
5000 Tunis Rd.
Sacramento, CA 95835

(916) 648-1092 (office)
(916) 205-1092 (cell)

34

Dr. F. Douglas Shields, P.E., Research Hydraulic Engineer
USDA Agricultural Research Service National Sedimentation Laboratory

Role of Vegetation in Levee Slope Stability and Revetment Durability

ABSTRACT

Effects of vegetation of slope stability of sandy levees were investigated. Six sites on the river side of the Sacramento River levee supporting various types of vegetation were intensively studied during the summer of 1987. Information on levee geometry, soils, vegetative cover, and root sizes and distributions was collected. These data were then used in seepage and slope stability analyses. Roots reinforced the levee soil and increased factors of safety for infinite slope and circular arc-type analyses of slope stability. Seepage analyses indicated no problems related to vegetation except under the most extreme (and unlikely conditions). These findings were confirmed using a recently developed numerical bank stability model, which predicted failure of the riverside levee slope without vegetation during extreme hydrologic conditions but stability with either bunch grass or large tree cover. Effects of woody vegetation on the ability of Sacramento River revetments to withstand forces created by high flows were examined by documenting vegetative cover on revetments before and after the 1986 flood using inspection records and aerial photographs. Revetment damage rates were significantly higher for older revetments, but differences based on vegetation cover were not significant.

Dr. F. Douglas Shields, P.E., Research Hydraulic Engineer
USDA Agricultural Research Service National Sedimentation Laboratory
PO Box 1157
Oxford, MS 38655-1157
Tel: (662) 232-2919
Email: dshields@ars.usda.gov <mailto:dshields@ars.usda.gov>
Web: iapreview.ars.usda.gov/pandp/people/people.htm?personid=5120

Doug has been a research hydraulic engineer at the National Sedimentation Laboratory of the USDA Agricultural Research Service since 1990. Prior to coming to NSL, he worked ten years in the Environmental Laboratory of the US Army Engineer Waterways Experiment Station, and he spent two years with the Nashville District of the Corps of Engineers. He earned a M.S. in environmental and water resources engineering from Vanderbilt (1977) and a Ph.D. in hydraulic engineering from Colorado State (1987). Research interests include stream corridor habitat rehabilitation in incising streams, role of woody debris in fluvial systems, riverine backwater rehabilitation and the influence of

vegetation on sedimentation and erosion. During the late 1980s he conducted studies of the effects of woody vegetation on Sacramento River revetments and levees. Doug is a member of the American Society of Civil Engineers and co-edited the book River Channel Restoration (John Wiley and Sons, 1996). He also was a contributor to the document, "Stream Corridor Restoration: Principles, Processes, and Practices", jointly published by 14 federal agencies. He is a registered as a professional engineer in Mississippi.

On Nov 24, 2008, at 9:11 AM, Holland, Elizabeth G SPK wrote:

David,

I have been out of the office due to a family emergency - the FEIS is now posted on the Corps web site. Tree removal will have to be addressed on a case-by-case basis. The Corps will require SAFCA to remove trees to comply with Corps Policy. I am not sure about the trees you are referring to but the project will only remove trees required to meet levee stability criteria and nothing more than that. The tree removal will be compensated for based on requirements under CEQA and county policy.

If you would like a hard copy of the FEIS please let me know and I will send one to you. We only sent actual documents to those who had commented - you stated that you commented on the document - we did not receive any comments from you on the Draft EIS - where and what did you sent? We work very hard to make commenting and public input as simple as possible, if you have any suggestions on making this process better please let me know. Letters were sent to over 700 people in the project area - and yes only 16 comments were made. While this seems like very little we can only provide the opportunity to comment but not make people actually send in comments. We did hold multiple public meetings and few people (no more than 20) showed up at those meeting so the 16 comment letters was not surprising to us.

We do not have an agronomist on staff at the Corps - decisions with regards to tree removal are made at our Headquarters level based on best available science and our geotechnical engineers expertise. I would again emphasize that the Corps will only require tree removal of those trees required for levee stability and Corps policy. Trees in levees and their risk factor is being studied extensively at the Corps but to date no new results have been verified to change our current policy.

Please let me know if you would like any additional information.

Thank you

Liz Holland
U.S. Army Corps of Engineers
Environmental Resources Branch
(916) 557-6763
elizabeth.g.holland@usace.army.mil

I2-1 As described in Section 2.3, "Proposed Action," in the Phase 3 DEIS/DEIR slopes of the existing levee *north* of the NEMDC Stormwater Pumping Station to Elkhorn Boulevard would be widened and flattened. However, only seepage and slope stability remediation would occur on the NEMDC west levee *south* of the NEMDC Stormwater Pumping Station to Northgate Boulevard; no landside slope changes are anticipated (see Plate 17c in the Phase 3 DEIS/DEIR). This remediation includes construction of a cutoff wall in the existing levee and/or reconstruction of portions of the levee from the NEMDC Stormwater Pumping Station to Northgate Boulevard where required to reduce and slope instability.

I2-2 Tree removal would be addressed on a case-by-case basis; however, it is anticipated that USACE will require removal of those trees required for levee integrity and to conform with USACE guidance regarding levee encroachments. An important purpose of landside vegetation removal is to provide a reliable corridor of access to and along the levee. The corridor must be free of obstructions to assure adequate access by personnel and equipment for surveillance, inspection, maintenance, monitoring, and flood-fighting. Accessibility is essential to the reliability of flood damage reduction facilities. USACE guidelines for vegetation removal address removal of "non-compliant" vegetation by requiring removal of all organic debris and filling and compacting voids according to original soil and compaction specifications (USACE 2009). See also Response to Comment I2-4.

I2-3 Land parcels included in the Phase 3 Project footprint are listed in Table H-1 in Appendix H of the Phase 3 DEIS/DEIR. USACE and SAFCA will arrange meetings to discuss individual concerns as appropriate. See also Responses to Comments I2-2 and I2-4.

I2-4 As noted in Impact 4.8-a of the Phase 3 DEIS/DEIR, page 4.8-3, no woodlands are expected to be removed along the PGCC and NEMDC levees as part of Phase 3 Project construction. Removal of levee encroachments is not a part of the Phase 3 Project. Section 1.4.2.1, "Encroachment", in the Phase 3 DEIS/DEIR has been revised to clarify the fact that removal of any encroachments, including trees, that could be identified as threatening levee integrity would be subject to future separate, environmental review and compliance with CEQA and NEPA.

The proposed woodland mitigation plan includes transplanting suitable trees from the Phase 3 Project footprint, where feasible, as well as planting a variety of native tree species that could become woodland habitat (see Mitigation Measure 4.8-a, "Minimize Effects on Woodland Habitat, Complete Detailed Design of Woodland Creation and Management Agreements to Ensure Compensation for Loss of Habitat, Implement all Management Agreements, and Comply with the DFG Section 1602 Permit Process," in the Phase 3 DEIS/DEIR). A detailed design of the woodland habitats to be created is being developed and provided for USFWS and DFG review and approval; protective mechanisms and specific management protocols for the woodlands are currently being prepared by SAFCA in coordination with these agencies.

I3

------ Forwarded Message
From: David Lichman <David@DavidLichman.com>
Date: Mon, 2 Mar 2009 15:51:39 -0800
To: Jay Davis <jdavis@gualco.com>
Cc: John Bassett <bassettj@SacCounty.NET>, Barbara Gualco <bgualco@gualco.com>, "Nagy, Meegan G SPK" <Meegan.G.Nagy@usace.army.mil>, "Turner, Claire Marie SPK" <Claire.Marie.Turner@usace.army.mil>, "Holland, Elizabeth G SPK" <Elizabeth.G.Holland@usace.army.mil>
Subject: Fwd: Tree Removal

Hi Jay,

Could you please make sure that our comments include reference to this attached agreement, as well as Dr. Gray's statements here?

Thank you

dml

Begin forwarded message:

------ Forwarded Message
From: David Lichman <David@DavidLichman.com>
Date: Mon, 2 Mar 2009 09:25:11 -0800
To: Jay Davis <jdavis@gualco.com>
Cc: John Bassett <bassettj@SacCounty.NET>, Barbara Gualco <bgualco@gualco.com>, "Nagy, Meegan G SPK" <Meegan.G.Nagy@usace.army.mil>, "Turner, Claire Marie SPK" <Claire.Marie.Turner@usace.army.mil>, "Holland, Elizabeth G SPK" <Elizabeth.G.Holland@usace.army.mil>
Subject: Fwd: Sacramento NLIP tree removal

I3-1

Hi Jay,

Could you please include this email in the comments for the EIR document under review?

Thanks

dml

From: harfgray@aol.com
Date: March 2, 2009 12:21:58 PM PST
To: David@DavidLichman.com
Subject: Tree Removal

Hello Mr. Lichman,

Doug Shields included me in copies of e-mail correspondence between you and him. He and I have collaborated and published papers on the effects of vegetation on levee stability and integrity. I too am working as a technical consultant to SAFCA.

I am surprised to hear about the imminent removal of the trees from the levee. My understanding is that an agreement was reached between the US Army Corps of Engineers and various California resource agencies (including SAFCA) to hold such removal in abeyance until a levee vegetation policy was developed.

A copy of this agreement or communique is attached as a PDF file. The relevant paragraph on page 2 reads as follows:

The agencies agreed to work together to draft a phased system-wide plan, with short-term and long-term elements, that will include vegetation management requirements for Central Valley levees and adjoining channels. Participants also agreed that levee-maintaining districts should defer any substantial vegetation removal along levees while this plan is being developed.

I3-1 Cont.

My understanding is that this agreement is still in force! In fact both SAFCA and the Corps are presently working along parallel tracts to develop a management / removal plan.

I'm not sure what parties you have spoken with, but in view of the above your principal recourse seems to be administrative and/or legal. I've assisted home owners and home owners associations in similar situations (in Portland, OR and New Orleans, LA). Both ultimately entailed legal actions (incl. injunctions) which can be very expensive, arduous, and uncertain!

Sincerely,

Donald H. Gray
Professor (Emeritus) of Civil and
Environmental Engineering
==========

From: David Lichman <David@DavidLichman.com>
Date: March 2, 2009 9:22:49 AM PST
To: "Shields, Doug" <Doug.Shields@ARS.USDA.GOV>
Cc: Nancy Lichman <nlichman@aol.com>, Zarah Wyly <zarah@sactree.com>
Subject: Re: Sacramento NLIP tree removal

Hi Doug,

Thank you for your help. According to the engineers that I spoke with... the tree removal is imminent.

If you are consulting to SAFCA, is it not possible that you could, without conflict of interest, at least direct them to look at the most current scientific and engineering data before moving ahead? I just hate to see these trees removed for expediency alone.

If you could direct me to a resource to consult in the private sector, I would certainly appreciate it. I don't really know where to begin looking.

Thanks

dml

On Mar 2, 2009, at 8:58 AM, Shields, Doug wrote:

Dear Mr. Lichman,

I cannot provide any direct assistance to you as I am a federal employee. Representing you in a conflict with the federal government violates professional ethics due to conflict of interest.

However, I am currently acting as a techncial consultant to the Sacramento Area Flood Control Agency (SAFCA) regarding levee vegetation. I read the text of Ms. Holland's message to you (below) with some interest. I was under the impression that tree removal from Sacramento Area levees was currently delayed pending research and investigations that are ongoing. The research is largely funded and conducted by the Corps, but with technical input from SAFCA.

Furthermore, SAFCA is proposing a plan to the Corps that would lead to gradual (long term) removal of trees, with those that pose real hazards removed first.

Ms. Holland's message seems to indicate that tree removal is imminent. Am I mistaken?

In the meantime, I suggest you contact SAFCA to get more information.
http://www.safca.org/contact/contact.asp

sincerely,

d

F. Douglas Shields, Jr. Ph.D., P.E., D. WRE
Research Hydraulic Engineer
USDA-ARS National Sedimentation Laboratory
PO Box 1157
Oxford, MS 38655-1157
doug.shields@ars.usda.gov
ph 662.232.2919
fax 662.232.2988

http://www.ars.usda.gov/Research/docs.htm?docid=12773

From: David Lichman [mailto:David@DavidLichman.com]
Sent: Thursday, February 26, 2009 1:24 PM
To: Shields, Doug
Subject: Sacramento NLIP tree removal

Hi Doug,

The NLIP threatens to remove several heritage oak trees from behind our property on the East Main Drain Canal in Sacramento.

I'm interested in any studies you have done regarding levee instability due to trees. I've copied what I've read on the SAFCA web site, but I've also talked with a local soil engineer, who indicated he had seen something regarding weakening the levees when the trees are killed, because the roots decay and make for more seepage pathways.

He suggested we hire an agronomist, but I'm not even sure where to look. The Corps indicates they do not have an agronomist on staff.

Can you help point us to some information that might help preserve these trees?

Thanks

David Lichman

5000 Tunis Rd.
Sacramento, CA 95835
(916) 648-1092 (office)
(916) 205-1092 (cell)

==========
34

Dr. F. Douglas Shields, P.E., Research Hydraulic Engineer
USDA Agricultural Research Service National Sedimentation Laboratory

Role of Vegetation in Levee Slope Stability and Revetment Durability

ABSTRACT

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Dr. F. Douglas Shields, P.E., Research Hydraulic Engineer
USDA Agricultural Research Service National Sedimentation Laboratory
PO Box 1157
Oxford, MS 38655-1157
Tel: (662) 232-2919
Email: dshields@ars.usda.gov <mailto:dshields@ars.usda.gov>
Web: iapreview.ars.usda.gov/pandp/people/people.htm?personid=5120

Doug has been a research hydraulic engineer at the National Sedimentation Laboratory of the USDA Agricultural Research Service since 1990. Prior to coming to NSL, he worked ten years in the Environmental Laboratory of the US Army Engineer Waterways Experiment Station, and he spent two years with the Nashville District of the Corps of Engineers. He earned a M.S. in environmental and water resources engineering from Vanderbilt (1977) and a Ph.D. in hydraulic engineering from Colorado State (1987). Research interests include stream corridor habitat rehabilitation in incising streams, role of woody debris in fluvial systems, riverine backwater rehabilitation and the influence of vegetation on sedimentation and erosion. During the late 1980s he conducted studies of the effects of woody vegetation on Sacramento River revetments and levees. Doug is a member of the American Society of Civil Engineers and co-edited the book River Channel Restoration (John Wiley and Sons, 1996). He also was a contributor to the document, "Stream Corridor Restoration: Principles, Processes, and Practices", jointly published by 14 federal agencies. He is a registered as a professional engineer in Mississippi.

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David,

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about the trees you are referring to but the project will only remove trees required to meet levee stability criteria and nothing more than that. The tree removal will be compensated for based on requirements under CEQA and county policy.

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We do not have an agronomist on staff at the Corps - decisions with regards to tree removal are made at our Headquarters level based on best available science and our geotechnical engineers expertise. I would again emphasize that the Corps will only require tree removal of those trees required for levee stability and Corps policy. Trees in levees and their risk factor is being studied extensively at the Corps but to date no new results have been verified to change our current policy.

Please let me know if you would like any additional information.

Thank you

Liz Holland
U.S. Army Corps of Engineers
Environmental Resources Branch
(916) 557-6763
elizabeth.g.holland@usace.army.mil

------ End of Forwarded Message

Media Communiqué

California Levee Vegetation Policy: Next Steps

21 September 2007

Background

The devastation of New Orleans by Hurricane Katrina in 2005 has focused national attention on levees and public safety concerns.

As a result, the U.S. Army Corps of Engineers (Corps) has determined that existing levee maintenance standards must be more rigorously enforced across the nation. In April 2007 the Corps released a draft white paper on the "Treatment of Vegetation within Local Flood Damage Reduction Systems" that called for the removal of wild growth, trees, and other encroachments which might impair levee integrity or flood-fighting access in order to reduce the risk of flood damage.

The Corps has proposed that levees which fail to meet these existing standards be rated as unacceptable, with the consequence that they could lose eligibility for federal assistance in post-flood levee rehabilitation as well as certification under FEMA's National Flood Insurance Program.

Due to the unique history of the flood control system in the California Central Valley, levee slopes often contain brush and trees that are the last remnants of a vast riparian forest which once extended across the valley floor adjacent to the Sacramento and San Joaquin rivers. Much of this vegetation provides important environmental, recreational, and cultural benefits that would be impacted by the stricter enforcement of Corps regulations.

In order to learn more about how levee safety goals can be met while protecting these environmental assets, the Corps, the State of California, and the Sacramento Area Flood Control Agency sponsored a levee vegetation symposium in Sacramento on August 28-29, 2007. The symposium brought together over 500 scientists, engineers, and policy-makers who shared important information about the risks, benefits, and methods to manage vegetation on and near levees.

Proposed Vegetation Management Approach

Following the symposium a group of senior leaders representing both flood management and resource protection agencies - including the Corps, the California Department of Water Resources, the State of California Reclamation Board, the U.S. Fish and Wildlife Service, NOAA's National Marine Fisheries Service, the California Department of Fish and Game, Reclamation District No. 2068, and the Sacramento Area Flood Control Agency - met to discuss how they could cooperate in achieving better levee safety while protecting and enhancing the environmental values that levees also provide.

The agencies agreed to work together to draft a phased system-wide plan, with short-term and long-term elements, that will include vegetation management requirements for Central Valley levees and adjoining channels. Participants also agreed that levee-maintaining districts should defer any substantial vegetation removal along levees while this plan is being developed.

In drafting this phased plan the Agencies will be guided by the following fundamental principles:

- Public safety is the top priority;
- It is urgent that levee integrity and maintenance concerns be addressed as rapidly as possible;
- Levee deficiencies not associated with vegetation issues will require corrective action, with the most urgent and cost-efficient actions implemented first. In the short-term, vegetation-related deficiencies will be addressed through this collaborative effort;
- The plan will be collaboratively formulated, focus on public safety, and respect the public trust responsibilities of all the involved agencies;

This plan may include bio-engineering techniques that could allow for the retention of stream bank riparian vegetation; the retention of vegetation on the landward side except where site-specific removal of brush and trees that compromise levee safety and emergency response access is required; and mitigation for any required levee slope vegetation removal. These actions would be phased in over a presently-undetermined time period combined with more intensive trimming and monitoring of existing vegetation. The plan will be comprehensive, in that it will also address other maintenance and engineering concerns that affect levee safety and use.

Consistent with the Corps' interim guidance, the State of California will take the lead in developing this phased plan, working closely with affected local levee-maintaining agencies. A draft framework for the plan will be available for stakeholder review in early 2008.

The Corps and the State of California will continue to conduct joint levee inspections this fall, rigorously applying the Corps' existing maintenance standards. Portions of the Central Valley levee system may receive consideration for a variance from the Corps' vegetation standard provided [1] that vegetation management meets the requirements of the inter-agency plan described above; and [2] the variance retains the safety, structural integrity, and functionality of the flood damage reduction system. The participating agencies agreed that preliminary 'unacceptable' ratings regarding vegetation would not cause levees within the Corps levee rehabilitation program to be classified as 'inactive' while this plan is being collaboratively developed and vegetation management progress meets the requirements of the plan. However, vegetation issues that are deemed by the joint inspection teams to significantly impair levee integrity or operations will require immediate attention.

This phased approach will give the State and local levee-maintaining agencies time to plan, design, and finance more intensive levee maintenance and vegetation management programs; apply the best available science; and deal with habitat mitigation on a system-wide basis. A phased approach will also ensure that public safety is not compromised and will allow flood risk to be reduced by addressing the most urgent problems first.

I3-1 See Responses to Comments I2-2 and I2-4.

I4

From: Bassett, John (MSA)
To: Rader, David; Dunn, Francine; Henningsen, Sarah; Holland, Elizabeth G SPK;
Subject: FW: Swabbies
Date: Thursday, March 05, 2009 10:37:01 AM

From: Jay Davis [mailto:jdavis@gualco.com]
Sent: Wednesday, March 04, 2009 8:46 AM
To: Bassett, John (MSA)
Cc: Barbara Gualco
Subject: FW: Swabbies

------ Forwarded Message
From: Christopher Barabino <swabbies_ontheriver@msn.com>
Date: Wed, 4 Mar 2009 15:28:19 +0000
To: Jay Davis <jdavis@gualco.com>
Subject: Swabbies

Jay,

I have been hearing some chatter from Garden Hwy residents about road closures on the Garden Hwy and the extensive extra work being done under the I-5 bridge area. As you know Swabbies is very concerned over the type and amount of access it will have during the construction period. For instance if North Bayou was shut down for days or months it would have catastrophic results on the business during that period since it will be during peak season. Please let me know of any news and I will be looking for the new EIR concerning the 2010 project. I4-1

Sincerely,

Chris Barabino

------ End of Forwarded Message

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I4-1 As stated in the Phase 3 DEIS/DEIR, approximately 1,000 feet of Garden Highway (about 500 feet upstream and 500 feet downstream of the I-5 Bridge) would be closed for approximately 8 to 12 weeks during the summer season to allow for cutoff wall construction. Access would be maintained to the two nearby marinas. North Bayou Road's intersection with Garden Highway would remain open; however, it would have a detour with a gravel surface during construction. This would allow access to the two private marinas north of the public boat launch ramp to remain open. Following completion of the cutoff wall, the intersection would be rebuilt, and roadway paving would be replaced.

As discussed in Impact 4.2-c, "Potential to Physically Divide or Disrupt an Established Community," in the Phase 3 DEIS/DEIR, temporary disruptions to access for residents and businesses are considered a significant impact. SAFCA would provide residents and business owners located adjacent to the construction areas with a construction timeline and will post its construction schedule on the SAFCA Web site (www.safca.org), as well as road closures and detour information. The schedule will be updated on a monthly basis (see Mitigation Measure 4.2-c, "Notify Residents and Businesses of Project Construction and Road Closure Schedule; and Implement Mitigation Measure 4.12-a, [Prepare and Implement a Traffic Safety and Control Plan for Construction-Related Truck Trips,] and Mitigation Measure 4.12-c, [Notify Emergency Service Providers about Project Construction and Maintain Emergency Access or Coordinate Detours with Providers]," in the Phase 3 DEIS/DEIR).

I5

From: Diane Hovey <dihovey@gmail.com>
Date: March 10, 2009 4:38:27 PM PDT
To: Barbara Gualco <bgualco@gualco.com>
Subject: Re: Diane Hovey Inquiry No. 3

Hi Barbara,

My 10am appointment slot is open on that day. I could easily book the meeting with you in that time.

Thank you,
Diane

On Tue, Mar 10, 2009 at 4:36 PM, Barbara Gualco <bgualco@gualco.com> wrote:
Hello Diane:

Would you be available any part of Monday, March 16 to meet at SAFCA offices in Sacramento. I have set aside time on the SAFCA calendar for an in-office meeting. Please let me know if you are free to meet, most likely in the a.m.

Regards,

Barbara Gualco

On Mar 9, 2009, at 6:08 PM, Barbara Gualco wrote:

If you would like to reach me by phone I am working at my desk...351-0600.

On Mar 9, 2009, at 5:31 PM, Diane Hovey wrote:

Hello Barbara,

True, this is not something that would normally go into a formal review. However, it is representative of the reality of what it is like living beneath the shadow of this project, coupled with the other slings and arrows life is throwing at all of us at present time. Perhaps, including it would bring a more human perspective to a project that has worked so diligently at removing that element for those of us living on the river side of the levee. In rereading my prior email, I note a grammatical error, but I do not read it as being the ramblings of a madwoman. That is, of course, my personal perspective. Left up to me, I would include it, as well as this response in the formal record.

Best regards,
Diane Hovey, Ph.D.

On Mon, Mar 9, 2009 at 5:14 PM, Barbara Gualco <bgualco@gualco.com> wrote:

Diane. Thank you for your message. I can certainly appreciate your position. I am presuming you do not wish this email to be entered in the formal record of comments that will become public record. Please confirm what you would like me to do with this message.

Barb Gualco

On Mar 6, 2009, at 6:48 PM, Diane Hovey wrote:

Barbara,

Thank you. As you might imagine I feel as though I am standing in front of an on-coming train. The value of my house has dropped significantly. Ben and I put a lot of cash into the construction phase, so I cannot afford to sell it. (Ben died a week after we moved in...the will and trust to change beneficiaries arrived a few hours after his death.) My client base has decreased due to the economy, which is making it nearly impossible to negotiate a refinance the 15-year mortgage to 30-years, which would let me meet my payments. Then, I am looking at construction that would further erode my ability to make a living. And, of course, there is the problem with my eroding river bank that is responding to the change in the flow of the river due to the DWR work across the the way, which I am ill equipped to repair. Meanwhile, the tax bill still comes in asking me to contribute to all of the projects that are "conspiring" to cause me to lose my home and all of my savings. Tell me again why I should be sanguine about what is happening around me.

I5-1

Best regards,

Diane Hovey, Ph.D.

On Fri, Mar 6, 2009 at 5:34 PM, Barbara Gualco <bgualco@gualco.com> wrote:

Diane,

Thank you for the follow-up message. I have responded to what I can tell you at this time. We look foward to discussing all issues noted in your email messages when a proposed project design is available for review. SAFCA's Natomas Levee Improvement Program Project Manager and designers have been made aware of your concerns.

Again, when this information becomes available, I will contact you and set a meeting.

Regards,
Barb Gualco

On Mar 6, 2009, at 12:00 AM, Diane Hovey wrote:

Hello Barbara,

Thank you for your response. I note that you have responded to three of the issues, but have declined to address the issue of relocation of my place of business from my home to an office during the construction phase although you do reference relocation to a hotel as a point of temporary residence. The nature of NeuroMuscular Therapy or any other type of therapy that involves physical contact is not something that translates well to a hotel environment. My home office is just that, it has a separate entrance, dedicated bath/restroom, waiting room, treatment room, and office. If I must relocate, I would need an office with equal amenities.

I5-1 Cont.

Best regards,

Diane Hovey, Ph.D.

On Thu, Mar 5, 2009 at 5:50 PM, Barbara Gualco <bgualco@gualco.com> wrote:

Ms. Diane Hovey 6075 Garden Highway
Hello and thank you for your email. I have not seen the "Garden Highway group's" email you referenced, so I am unable to respond specifically to its content. However, I am familiar with your location from our prior exchanges.

As you are probably aware, the EIS/EIR is meant to address several construction alternatives that could be implemented for the project and evaluate the potentially significant environmental impacts of those alternatives. However, it does not determine which of those alternatives will ultimately be constructed in any given area. Well before the 2010 construction season begins, SAFCA's project designers will have more definitive plans developed which will help to address the issues you have raised: 1.) information regarding any suggested detours for traffic necessitated by road closures, 2.) proper notification of pending 24-hour construction, if applicable, and 3.) the opportunity for impacted residents to temporarily relocate to a hotel.

I anticipate that this detailed construction information will be available in the fall of 2009. SAFCA will work to explore opportunities to reduce the impact on residents living and working near the project. SAFCA staff and consultants will certainly take into consideration the issues you have raised and work with you to address them. Once we have those details, we would be happy to schedule a meeting with you to discuss how construction may impact your property specifically and the mitigation measures that are available. In the meantime if there is anything that you require, please do not hesitate to get in contact with my office.

Barbara Gualco cc: Jay Davis, Ombudsman

Hello Barbara,

There was a recent email from the Garden Highway group that stated the work at Garden Highway and N.Bayou road will require the road be closed to traffic for an extended period along with the 24 x

I5-1 Cont.

7 truck activity. Apparently SAFCA is offering to cover hotel rooms for those who will not be able to sleep through the noise.

I work from my home. My therapy office was designed into the house and has its own business entrance. If the road is closed to traffic, how am I supposed to a) live in my house and b) make a living...that activity that produces the income that goes to pay the taxes, that fund the jobs of the people that will apparently be keeping me from working..... Is SAFCA proposing to obtain a professional office (of equal quality) for me in another location for the duration of the construction period? If so, is SAFCA also going to pay for moving my office equipment to and from that new location?

I5-1
Cont.

Based on what I have seen on the drawings, I thought the property across from me is supposed to have seepage wells installed instead of widening the levee. That seems quite at odds with closing the road at N. Bayou and Garden Highway for widening. Please clarify SAFA's intentions for me. I am located at 6075 Garden Higway, about 0.4-mile north of the I-5 overpass and the N.Bayou / Garden Highway intersection.

Best regards,

Diane Hovey

I5-1 See Response to Comment I4-1.

Mitigation Measure 4.14-a, "Implement Noise-Reducing Construction Practices, Prepare a Noise Control Plan, and Monitor and Record Construction Noise Near Sensitive Receptors," in the Phase 3 DEIS/DEIR requires that residents in or near the affected work area would be afforded the opportunity, at SAFCA's expense, to temporarily relocate to a nearby hotel for as long as the 24/7 cutoff wall construction schedule persists within 500 feet of their residence. Under the Proposed Action, access to residences along Garden Highway would remain open, with some temporary construction closures. Mitigation Measure 4.2-c, "Notify Residents and Businesses of Project Construction and Road Closure Schedule; and Implement Mitigation Measure 4.12-a, "Prepare and Implement a Traffic Safety and Control Plan for Construction-Related Truck Trips," and Mitigation Measure 4.12-c, "Notify Emergency Service Providers about Project Construction and Maintain Emergency Access or Coordinate Detours with Providers," requires SAFCA to notify residents and businesses of the construction schedule and road closures and detours. Under the Levee Raise-in-Place Alternative, Mitigation Measure 4.2-c further requires SAFCA to negotiate an agreement, consistent with the terms of existing leases, with any business required to suspend operations during levee/cutoff wall construction in order to reimburse them for loss of revenue during the time that they will be closed, based on actual income for that time of year. USACE and SAFCA are committed to maintaining good communications with potentially affected residents and business owners throughout project planning and construction, and meeting with those affected to discuss individual concerns. See also Master Response: 24/7 Cutoff Wall Construction.

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I7

From: Holland, Elizabeth G SPK
To: bassettj; Dunn, Francine; Henningsen, Sarah; Washburn. Timothy (MSA); Jay Davis;
Subject: NLIP Phase 3 comment
Date: Monday, March 16, 2009 11:00:35 AM

John, Francine, and Sarah,

I received a call from Mr. Ed Bianci with regards to the Phase 3 NLIP project - he would like to make an official comment on the design of the levees and irrigation ditches. He would like the footprint to be as small as possible because the larger the footprint the more land he will loose. He does not want his land to be fragmented with ditches and native grasses. He does not understand and does not want there to be a 50 to 60 foot buffer on the landside of the levee or irrigation ditches. He does not want the ditches to be so large and does not believe they need to have a 5:1 slope. I7-1 I7-2 I7-3 I7-4

He would like to receive any future documents related to this project. I7-5

John - he is also expecting an engineer to call him this week per Jay Davis. I also informed him that we do not have control over the irrigation ditches and the extra land being obtained beyond the levee structure and the required landside maintenance road. He said you told him all of the design was based on requirements from the Corps of Engineers - I told him only the levee structure and maintenance area has Corps requirements - not the irrigation ditches. Can you please call him and discuss the irrigation ditches and their design. I7-6

Thank you all.

Liz Holland
U.S. Army Corps of Engineers
Environmental Resources Branch
(916) 557-6763
elizabeth.g.holland@usace.army.mil

I7-1 Comment noted; USACE and SAFCA have designed the Phase 3 Project in an effort to reduce acquisition of private property.

I7-2 Comment noted; Appendix H of the Phase 3 DEIS/DEIR includes a list of parcels that are located within the Phase 3 Project footprint. The Proposed Action includes the relocation of the existing Elkhorn Canal south of Elkhorn Reservoir. Portions of privately maintained local canals, some of which may provide a drainage function, would be overlapped by the footprint of the adjacent setback levee along the Sacramento River east levee. Drainage would need to be rerouted to new replacement canals before the existing canals are decommissioned to ensure that local drainage and ponding areas would not be adversely affected as a result of project construction. Detailed plans for these replacements are still under development.

As noted in Mitigation Measure 4.4-b, "Coordinate with Landowners and Drainage Infrastructure Operators, Prepare Final Drainage Studies as Needed, and Implement Proper Project Design," in the Phase 3 DEIS/DEIR, project engineers will coordinate with owners and operators of local drainage systems and landowners served by the systems throughout detailed project design. This coordination will enable the project engineers to evaluate the preproject and postproject drainage needs and the design features to consider in project design.

The footprint of the setback levee, maintenance corridor, levee setback area, and extension of the Elkhorn Canal would encroach upon the western side of the commenter's property, adjacent to the existing levee. The project footprint would be restricted to the west side of the property; therefore the property would not be fragmented into smaller pieces and would not make farming practices difficult or infeasible. The alignment of the Elkhorn Canal was sited as close to the new levee toe as possible, which reduces land acquisition. The width of the right-of-way for the relocated canal is needed to accommodate the canal itself, embankments on both sides, and patrol roads. The canal alignment is described in Appendix H of the Phase 3 DEIS/DEIR.

I7-3 A 50-foot-wide operations and maintenance corridor is required by CVFCB, and necessary for considerations such as utility upkeep and woodland corridor function. Specific circumstances, such as residences, businesses, and some existing utilities allow for a reduced corridor of 20 feet in width in certain areas. SAFCA will compensate owners for land acquired as a result of project implementation.

I7-4 The proposed canal embankments are planned to be built with a 3:1 ratio, not a 5:1 ratio, as the commenter states. Regarding the size of the ditches, canals, and other irrigation components, project design is based upon needs in Natomas Basin, including irrigation system connectivity considerations. These components also include operations and maintenance corridors. See Section 2.3.4, "Irrigation and Drainage Components," and Appendix H, "Construction Details," in the Phase 3 DEIS/DEIR for further information.

I7-5 Comment noted; the commenter has been added to the NLIP distribution list for future environmental documents.

I7-6 See Response to Comments I7-2 through I7-4 and Master Response: Sacramento River East Levee Prism.

I8

Mr. John Bassett
Director of Engineering, SAFCA
1007 7th St.
Sacramento, Ca. 95814

April 6,2009

Ref: Natomas Levee Improvement, Phase 3 DEIS/DEIR

As a resident of Valley View Acres, I am surprised the DEIS/DEIR has not provided more specific information regarding construction to the NEMDC and a better analyze of the impacts to our community.

Valley View Acres is an approximately 300 acre community bounded by Elkhorn Blvd on the north, Del Paso Road on the south, Sorento Road on the west, and the East Levee Road on the east. Included in this area are 150 residential homes, two horse farms, one cattle ranch, and other livestock. Water for drinking, cleaning, agricultural irrigation, and livestock care is provided by private wells maintained by Valley View Acre Residents. I8-1

The NEMDC construction will border our community for two miles. It will create the usual issues of road closures, noise, traffic etc. However, I have special concerns regarding the impact to ground water and thus affecting our well water.

1. The ground water evaluation as provided by the consulting engineers Luhdorff and Scalmanini are based on the Integrated Groundwater and Surface Water Models (IGSM) dated 2004 for present conditions and project conditions for the year 2030. An updated model by WRIME in 2008 is the model for the Sutter/Placer County portion. Is there an update model for Sacramento City/County/Natomas areas? After three years of draught and maybe more to follow, should a new draught-type model be prepared? I8-2

2. According to the Luhdorff and Scalmanini Groungwater Report, the impact of ground water flows beneath the NEMDC West Levee with proposed cutoff walls installed will drop from 684 to 547 acre feet yearly for the 2004 ("existing") simulation and from 38 to 30 acre feet yearly for the 2030 simulation (Table 6-6) for a 3% drop. The slurry walls along the length of the levee are estimated to be 60-80 feet deep. Most of our residential water wells are 50-80 feet deep. How can these combined conditions not greatly impact our access to water? Our water wells may have to go deeper. If needed, will the DEIS/DEIR provide compensation for water well improvements? I8-3

3 .According to section 9.3, "no groundwater contamination would be expected due to construction of the proposed slurry walls and other improvements..." After 30 years of living in Valley View Acres, my water has been contaminated three or four times for periods of three to eight days when some new well has been dug in the neighborhood. If my water has been contaminated by a 12 inch bore, why would it not be contaminated by a two mile 80 foot slurry wall? I8-4

Apr 06 09 03:18p p.1

This DEIS/DEIR document appears to ignore ground water impacts that may occur during the NEMDC construction. If not addressed in this document, I hope a through up to date analysis will be conducted with appropriate mitigation measures included in Phase four documentation. I8-5

Thank You for the chance to comment,

Anthony Trujillo

p.1

Apr 06 09 03:20p

I8-1 See Master Response: Groundwater Hydrology in the Vicinity of the NEMDC.

I8-2 See Master Response: Groundwater Hydrology in the Vicinity of the NEMDC.

I8-3 See Master Response: Groundwater Hydrology in the Vicinity of the NEMDC.

I8-4 See Master Response: Groundwater Hydrology in the Vicinity of the NEMDC.

I8-5 See Master Response: Groundwater Hydrology in the Vicinity of the NEMDC.

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I9

From: Chris Mortensen [mailto:mortens1@apple.com]
Sent: Monday, April 06, 2009 3:01 PM
To: Elizabeth.G.Holland@usace.army.mil; Bassett. John (MSA)
Cc: Chris Mortensen; Caroll Mortensen
Subject: EIR / EIS Phase Three Landside Improvement Project Comments

To: Mr. John Bassett

Ms. Elizabeth Holland

From: Chris and Caroll Mortensen

6576 Garden Hwy

Sacramento, CA 95837

RE: EIR / EIS Phase Three Landside Improvement Project

Please accept these comments in response to the draft EIR / EIS:

As property owners on the landside of the Garden Hwy in Reach #8, we are still concerned that an EIS / EIR is still proceeding with so many variables that have not been decided. It seems that it would be problematic to determine the scope of the project. I9-1

We have not received any type of formal offer or estimate as to where and how much of our property would be needed to complete the project. This seems a necessary step and critical to the estimation of the scope and impact of the project. Without knowing what the levee and other improvements would look like on our property it is not understandable as to what the EIR/ EIS should look for and what the alternatives are.

I9-1 Cont.

Along these lines, but in the broader scope, the same uncertainty as to what the impact to our parcel seems to exist for the final project. It seems problematic to perform an adequate EIR/ EIS under those circumstances.

The latest EIR/EIS appears to show our parcel surrounded by borrow sites. Since the ground water is extremely high in the winter we are concerned that we will surrounded by a potential swamp. We are concerned the type of eco system that this will promote and the potential for mosquitoes.

I9-2

Specifically clarity is lacking regarding:

What structures as well as trees and other vegetation are proposed to be removed and from where.

I9-3

Clarity is also lacking as to the relocation of the power poles along the Garden Hwy and where and when they will be moved.

In the areas where they will be constructing 'slurry walls', it appears there will be around the clock, 7 day per week construction. It is unclear if this evaluated in this phase of the EIR / EIS.

It also appears that the possibility of around the clock, 7 day per week construction for ANY sections deemed necessary to keep the project moving within the timeline. It is not clear in what areas slurry walls will be constructed, or how long noise and construction will affect individual homeowners. I9-4

Construction of this type will likely have to noise, dust, and vibration generated from the tremendous trucking and digging activity that will be happening at the various 'borrow' sites located adjacent to the Garden Hwy. This seems to be a larger impact that the previous construction schedules and the increase does I9-5

Also, it appears that there are future variables with requirements that are likely to be imposed by other agencies including the Army Corps of Engineers that will come in the future that may necessitate changes in the proposed current project. This also makes the complete and adequate preparation of an EIR / EIS problematic I9-6

Thank you for your consideration of these comments. Please contact us if you have further questions.

Chris and Caroll Mortensen

Elizabeth.G.Holland@usace.army.mil

ATTN: US Army Corps NLIP Phase 3 DEIS

And

BassettJ@saccounty.net

ATTN: SAFCA N

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I9-1 The scope of the project is addressed in Chapter 2.0, "Alternatives," in the Phase 3 DEIS/DEIR where the construction methods are described, as well as in Appendix H, "Project Construction Details," in the Phase 3 DEIS/DEIR. Impact analysis has proceeded on the basis that design refinements, including exact property acquisition requirements, would occur beyond the timeframe of the Phase 3 DEIS/DEIR. Where uncertainty exists in terms of ultimate project footprint or use of potential soil borrow sites, the impact analysis is based on probable worst-case scenarios. As noted in Section 2.3.6, "Lands, Easements, Relocations, and Rights-of-Way," in the Phase 3 DEIS/DEIR, privately owned lands would be acquired in fee. Real property acquisition and relocation services would be accomplished in accordance with the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970, (42 USC 4601 *et seq.*) and implementing regulation, 49 CFR Part 24; and California Government Code Section 7267 *et seq.*

I9-2 As described in Section 3.3.4.5, "Groundwater Hydrology," in the Phase 3 DEIS/DEIR, groundwater levels in the Natomas Basin average 10–25 feet below ground surface level. Borrow material excavation would be between 2 and 5.4 feet, as described in Table 2-2 of the Phase 3 DEIS/DEIR, and should therefore not penetrate underground aquifers. In addition, groundwater monitoring in the Natomas Basin has been in place for decades (see Appendix B of the Phase 3 DEIS/DEIR). Data extracted from this monitoring, in conjunction with geotechnical borings completed prior to excavation activities would ensure that use of borrow materials would not be extracted to a depth that would create swamp habitat that may be an attractant to mosquitoes.

I9-3 See Response to Comment O2-5 regarding removal of encroachments. Mitigation Measure 4.17-b, "Verify Utility Locations, Coordinate with Utility Providers, Prepare and Implement a Response Plan, and Conduct Worker Training with Respect to Accidental Utility Damage," in the Phase 3 DEIS/DEIR addresses the potential impacts of power pole relocations. Exact locations for relocated power poles would be determined through detailed project design. The timing of relocation of power poles is addressed in Appendix H, Section 2.2, "Construction Sequence," in the Phase 3 DEIS/DEIR.

I9-4 See Master Response: 24/7 Cutoff Wall Construction.

I9-5 Impacts associated with noise, dust, and vibration are presented in Sections 4.13, "Air Quality," and 4.14, "Noise," in the Phase 3 DEIS/DEIR. Magnitude and duration of construction of various project phases may overlap and could occur over a different time frame than presented in the Phase 3 DEIS/EIR. The scenario presented in the Phase 3 DEIS/EIR is the reasonable worst-case scenario and encompasses the maximum extent of impacts from implementation of the Phase 3 Project.

I9-6 With any proposed project, it is likely that as detailed project design proceeds, project refinements or modifications may become necessary. As these refinements/modifications are identified, the lead agencies must consider whether the environmental review adequately evaluated the impacts of the refined/modified proposed project, or whether additional or supplemental analyses are warranted.

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I10

-----Original Message-----
From: Gibson Howell [mailto:gib@mail.com]
Sent: Monday, April 06, 2009 4:57 PM
To: Bassett. John (MSA)
Subject: Phase 3 NLIP Comments

John,

SAFCA

Below are my comments concerning SAFCA's Phase 3 of the NLIP DEIS:

1. This document is 484 pages and very disjointed. It repeats itself in several areas, very technical for the average 'stakeholder', and includes very significant information couched within seeming unimportant subsections (i.e.: not in the synopsis). I would like to know how many of the SAFCA board and USACE staff have been able to review the ENTIRE document in a detailed way. I10-1

2. From on my read of the EAR, the 'No Action Alternative' is MUCH worse to the residents of Natomas and the environment than the EIR implies. Based on current USACE standards, Natomas residents would not gain any meaningful flood protection, and the Army Corps would require 'de-nuding' of the levees causing irreparable harm to the environment, those living on the Garden Hwy, and the greater community who enjoys all the recreational activities and beauty the river provides. I10-2

3. I am very concerned the EIR dismissed other flood protection improvement alternatives that could reduce the risk to Natomas, lessen the strain on the levee during floods, and possibly relegate the levee to a 'backup' during flood events. This could also allow the levee to exist in its 'current state' (with all environmental habitat preserved) since the chance of flooding would be greatly diminished. I10-3

Please provide further explanation why these alternatives were dismissed:

Increasing the use of bypasses (Yolo, Fremont, Sacramento, etc)to contain the massive amount of water that has to flow down a relatively narrow channel (the river). The Central Valley Flood Protection Board (CVFPB) includes this as a viable option they are working on in their current "Framework" document. SAFCA seems to dismiss it because it would involve "too many other agencies outside of their control". Doesn't the State have a plan to work together, called "FloodSAFE"?

I10-3 Cont.

Increasing the number of reservoirs. We are living in drought conditions, yet no government agencies seems willing to address the need for more reservoirs. This would increase our water supply and reduce the chance of flooding. A win/win in my opinion.

Study and implement 'watershed plans' that have been proposed by scientists to improve flood control, enhance our environment, and increase our water supply.

4. Disruption of utility service during NLIP construction

Local residents have still not been informed how long they can expect to be without utility service during the construction and power pole relocation. I think this is basic information we need to know since we all rely exclusively on electricity for everything (no city gas, sewer, water).

I10-4

5. SAFCA has continually advocated the 'adjacent setback levee' will move the "levee prism" landside and effectively remove our properties from current USACE, RD1000, and Title 23 levee standards. I agree with the concept and feel they are actively advocating this position, but I have never seen an actual diagram of the "new" levee prism showing we will be outside of it and thus exempting any requirement to conform to 'levee prism' standards.

I10-5

6. Title 23 (Waters) Division 1, Chapter 1, Article 8, Paragraph 133 needs to be updated to address the 'adjacent set-back levee'. This section was specifically created to accommodate the unique conditions of the Natomas section of the levee. This section was written in 1996, and should be re-written to incorporate the obvious advantages gained by the increased size of the levee.

I10-6

7. 24/7 Construction. Nowhere in the NLIP does it state how long the "average" homeowner will be subject to 24/7 construction. Furthermore, it states there is a possibility for continuous 24/7 construction and does

I10-7

not
address the fact that this construction would require the use of
equipment
and trucks along a great length of the Garden Hwy due to the use of
multiple
'borrow facilities' next to the homeowners. How can we judge this EIR
if we
have no idea how long we will be affected?

I10-7
Cont.

Thank you for your time and consideration,

Gibson Howell
3551 Garden Hwy
916/730-0141

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I10-1 The Phase 3 DEIR/DEIS has been prepared by both the USACE, Sacramento District, as Federal lead agency under NEPA and SAFCA as state lead agency under CEQA. As such, appropriate staff from both lead agencies has participated in the development and review of the Phase 3 DEIR/DEIS, which was developed in accordance with applicable NEPA and CEQA regulations.

I10-2 See Responses to Comments L3-10 and O2-2, which address concerns regarding the environmental effects of the No-Action Alternative.

I10-3 Numerous alternatives have been considered by SAFCA to provide flood risk reduction to the Natomas Basin. These alternatives have been evaluated and eliminated from further consideration during completion of previous environmental documents. More detailed information on alternatives considered but eliminated is provided in Appendix I, "Alternatives Formulation and Screening Details," of the Phase 3 DEIS/DEIR. See also Response to Comment L3-8.

The Yolo Bypass Improvements Alternative was eliminated because (1) it would be too costly for SAFCA to implement; (2) even following implementation of this alternative, some levee height increases and substantial seepage, underseepage, and slope stability remediation would still be required for the perimeter levee system, adding to the costs; (3) these improvement lie outside of SAFCA's jurisdiction and would require Federal, state, and location cooperation and funding; and (4) the project objective of restoring 100-year flood protection to the Natomas Basin could not be achieved as quickly as possible (considered and eliminated in Phase 2 EIR and Phase 2 EIS). The alternatives that were carried forward would address the immediate flood control issues facing the Natomas Basin in a way that would not adversely affect other portions of the Sacramento River system or other entities with flood management responsibilities. These alternatives would not prejudice the state's FloodSAFE effort or other future efforts from identifying additional long-term solutions to the flood protection system deficiencies related to the river system, including improvements to the Yolo and Sacramento Bypass systems and additional reservoir and watershed management plans.

I10-4 See Response to Comment O2-3.Temporary electrical service outages during relocation of electrical utilities are expected to be approximately four hours in duration and are not anticipated to exceed eight hours. No disruption of service during construction of flood risk reduction facilities is anticipated.

I10-5 See Master Response: Sacramento River East Levee Prism.

I10-6 See Response to Comment O2-8.

I10-7 See Master Response: 24/7 Cutoff Wall Construction. Further, as shown in Plate 10 in the Phase 3 DEIS/DEIR, and as agreed upon in the settlement agreement between SAFCA the Garden Highway Community Association (Appendix G of the Phase 3 DEIS/DEIR), haul routes for levee embankment material would not be located on Garden Highway.

I11

From: Laura Gilbeau [mailto:lauragilbeau@gmail.com]
Sent: Monday, April 06, 2009 9:32 PM
To: Bassett. John (MSA)
Subject: Sacramento Levee project - 5871 Garden Highway

April 6, 2009

Dear Interested parties

Metro Marina, located at 5871 Garden Hwy, is in the business of renting space for a Restaurant (Swabbies), residences, boat slips and dry storage. Closing or disrupting our business in the middle of summer could seriously impact our ability to charge rents due to the seasonality of our location. Some of our boat customers rent slips for the year with the anticipation of having the prime time use during summer. If our customers were forced to find other accommodations during the levee repairs they may not return, impacting our revenue for several months after the access is regained. Please consider making adequate access roads around construction so we don't lose our valuable clients to other marinas. I11-1

Sincerely,

Laura and Harvey Gilbeau
Don and Anita Glidewell
916-869-2625
Metro Marina Partnership

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I11-1 See Responses to Comments I4-1, PH-2, and PH-3.

I12

From: Christopher Barabino [mailto:swabbies_ontheriver@msn.com]
Sent: Monday, April 06, 2009 9:27 PM
To: elizabeth.g.holland@usace.army.mil; Bassett. John (MSA)
Subject: Public comments Draft EIR

April 6, 2009

Dear SAFCA and interested parties,

Swabbies Restaurant at 5871 Garden Hwy is currently a thriving seasonal destination. We rely on a number of different patrons such as boaters, motorcyclists, airport employees, fisherman, and local Garden Hwy residents to name a few. The draft EIR spells out possible closures or disruptions in 2010, during our peak season. Even a moderate disruption during the critical summer months could result in the entire 2010 being lost.

Our business needs the best possible access from all directions that is suitable for all types of vehicles. In addition the access needs to be simple without creating time delays for our customers. We also rely on the Elkhorn Boat Launch for business. I have suggested that perhaps a co-op arraignment be made to temporary connect the two properties and share driveways during construction. I have also suggested that we could possibly save asphalt grindings during the levee tear down and use it to make a solid two lane temporary access to our business. I12-1

Please consider my verbal statements from May 19th in front of the board of supervisors. Hopefully our restaurant can continue to thrive even with the levee repairs. Please don't hesitate to contact me for further information or mitigation suggestions. I12-2

Sincerely

Christopher Barabino
Owner Swabbies Restaurant
916-320-4126

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I12-1 See Response to Comments I4-1, PH-2, and PH-3.

I12-2 See Response to Comments I4-1, PH-2, and PH-3.

I13

March 27, 2009

Mr. John Bassett
Director of Engineering
SAFCA
1007 7th Street, 7th Floor
Sacramento, CA 95819

Re: Draft Environmental Impact Statement/Draft Environmental Impact Report (DEIS/DEIR) for the Natomas Levee Improvement Program (NLIP), Phase 3 Landslide Improvement Project (Phase 3 Project)

Dear Mr. Bassett,

My family and I have are long time residents of the Valley View Acres Community (VVA) residing on Sorento Road between Del Paso Road and the East Levee Road. Because our location within the Natomas Basin and a constant threat of flooding, we have been supportive of all flood control efforts by SAFCA and the U.S. Army Corps of Engineers. In general, we are in support of the Phase 3 Project. However, we are concerned that the DEIS/DEIR never addressed critical areas of concern for the VVA Community. These critical areas of concern include groundwater and wells, traffic impacts, noise, soils and land use. Because these issues were not covered in the DEIS/DEIR, we believe these documents must be revised and re-circulated to comply with the requirements of the National Environmental Policy Act (NEPA) and the California Environmental Quality Act (CEQA). I13-1 I13-2 I13-3

In the Phase 3 DEIS/DEIR there is no mention of the traffic related noise and emergency service impacts to the Valley View Acres Community. Most importantly, there is no mention of impacts to domestic wells for VVAC residents. I13-4

Chapter 3 page 54, there is no mention of using Sorento Road as a project area road way for the project which is a vital road way for my family. I13-5

In Chapter 4, Hydrology and Hydraulics, there is no review of the effects on groundwater and domestic wells. This issue is important to my family and other residents here in VVA. We are concerned that are wells will not go dry because of the improvements to the levee. We believe that if wells are affected, it should be the responsibility of SAFCA to amend and finance the needed improvements to ensure my well, as well as all domestic wells within our community, are protected and run as they had prior to levee improvements. This issue must be reviewed and analyzed prior to moving forward with this project. I13-6

My family and I are long time supporters of flood protection within the Natomas Basin including additional assessments on properties for flood protection. However, because the Phase 3 Project DEIS/DEIR failed to review potentially significant impacts to the community my family and I reside in, Valley View Acres Community, we must call for the analysis to be revised and relevant mitigation measures be included, to address the impacts of how this project will effect my family and other residents of the Valley View Acres Community. I13-7

Respectfully,

Joe Angel & Angela Angel

5600 Sorento Road
Sacramento CA 95835

JOSEPH & ANGELA
ANGEL
5800 SORENTO RD.
SACRAMENTO CA 95835
7008 1300 0001 7085 1933
CERTIFIED MAIL
7008 1300 0001 7085 1933
U.S. POSTAGE
WEST SACRAMENTO,CA
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SAFCA
Mr. John Bassett
Director of Engineering
1007 7th Street, 7th Floor
Sacr
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BC: 95691102 *1241-15883-01-38

I13-1 Comment noted; the commenters are long-time residents of the Valley View Acres Community Association.

I13-2 See Response to Comment O4-13.

I13-3 See Response to Comment O4-25.

I13-4 See Response to Comment O4-17 regarding emergency service impacts to East Levee Road, adjacent to the Valley View Acres Community. Noise-sensitive land uses that could be affected by construction on the NEMDC west levee are discussed under Impact 4.14-a, "Generation of Temporary, Short-Term Construction Noise," in the Phase 3 DEIS/DEIR. These would include the VVA neighborhood. See also Master Response: Groundwater Hydrology in the Vicinity of the NEMDC.

I13-5 See Response to Comment O4-11. Construction of the Phase 3 Project would not include the use of Sorento Road as a truck haul route (see Plate 10 in the Phase 3 DEIS/DEIR).

I13-6 See Master Response: Groundwater Hydrology in the Vicinity of the NEMDC.

I13-7 See Response to Comment O4-25.



MARCH 19, 2009 - SAFCA BOARD OF DIRECTORS MEETING TRANSCRIPT

CHAIR SUSAN PETERS:
CALL TO ORDER THE SACRAMENTO AREA FLOOD CONTROL AGENCY MEETING FOR MARCH 19, 2009.

WOULD YOU LIKE TO CALL THE ROLL.

CLERK:
JAMES GALLAGHER
JIM MILLER - HERE
JOHN SHIELS - HERE
BRIAN HOLLOWAY -
VIRGINIA MOOSE - HERE
STEVE COHN -
BONNIE PANNELL - HERE
RAY TRETHEWAY -
ART GEE - HERE
DENNIS ROGERS - HERE
DON NOTTOLI -
ROGER DICKINSON - HERE
SUSAN PETERS - HERE

MADAM CHAIR WE HAVE A QUORUM

CHAIR SUSAN PETERS:
OKAY, THANK YOU.

OUR FIRST ITEM IS A CLOSED SESSION, WHICH WE ARE GOING TO CANCEL SINCE THE ANALYSIS HAS NOT BEEN COMPLETED AND THEN WE WILL LOOK TO DO THAT AT OUR NEXT MEETING.

SO WE WILL GO ON TO TIMED ITEMS NOW.

CLERK:
I NEED TO READ THE OPENING STATEMENT

CHAIR SUSAN PETERS:
OKAY, THAT'S FINE

CLERK
GOOD AFTERNOON LADIES AND GENTLEMEN, THIS MEETING OF SAFCA IS BEING BROADCAST LIVE AND WILL BE CABLECAST WITHOUT INTERRUPTION ON METRO CABLE 14. TODAY'S MEETING WILL BE REPEATED ON FRIDAY, MARCH 20TH, AT 1:00 P.M. ON CHANNEL 14. THIS MEETING IS BEING CLOSED CAPTIONED AND WILL BE WEBCAST AT WWW.SACMETROCABLE.TV STREAMING VIDEO OF THE BOARD MEETING IS AVAILABLE ON WWW.SAFCA.ORG WITHIN 48 HOURS AFTER THE MEETING. A VHS COPY IS ALSO AVAILABLE FOR CHECK OUT FROM ANY LIBRARY BRANCH.

MEMBERS OF THE AUDIENCE WISHING TO ADDRESS THE BOARD SHOULD FILL OUT A BLUE SPEAKER FORM LOCATED ON THE TABLE AT THE ENTRANCE OF THE CHAMBERS AND AT THE PODIUM, AND GIVE IT TO THE CLERK. WHEN ADDRESSING THE BOARD, PLEASE IDENTIFY YOURSELF FOR THE RECORD AND SPEAK DIRECTLY INTO THE MICROPHONE AND PLEASE LIMIT YOUR COMMENTS TO THREE MINUTES. THANK YOU.

CHAIR SUSAN PETERS
OKAY, THEN I SUPPOSE WE OUGHT TO DO THE PLEDGE, MR. ROGERS..

ALL:
I PLEDGE ALLEGIANCE TO THE FLAG OF THE UNITED STATES OF AMERICA, AND TO THE REPUBLIC FOR WHICH IT STANDS, ONE NATION UNDER GOD, INDIVISIBLE, WITH LIBERTY AND JUSTICE FOR ALL.

CHAIR SUSAN PETERS:
SO NOW WE'LL SAY THAT WE ARE CANCELLING THE CLOSED SESSION AND MOVING ON TO TIMED ITEMS.

CLERK:
TIMED ITEM; ITEM 1. PUBLIC HEARING - DRAFT ENVIRONMENTAL IMPACT STATEMENT/ENVIRONMENTAL IMPACT REPORT ON THE NATOMAS LEVEE IMPROVEMENT PROGRAM PHASE 3 LANDSIDE IMPROVEMENTS PROJECT.

TIM WASHBURN:
MADAM CHAIR, MEMBERS OF THE BOARD, TIM WASHBURN, SAFCA STAFF.

THIS ITEM IS A PUBLIC HEARING ON THE DRAFT ENVIRONMENTAL IMPACT STATEMENT AND ENVIROMENTAL IMPACT REPORT FOR THE NATOMAS LEVEE IMPROVEMENT PROGRAM LANDSIDE IMPROVEMENTS PROJECT, PHASE 3. IT'S THIS DOCUMENT AND I KNOW WE INCLUDED IT IN THE BOARD'S PACKET AND IT'S OF COURSE POSTED ON SAFCA'S WEBSITE, AND WHAT WE HAVE TODAY FOR THE BOARD, I WILL MAKE KIND OF A BRIEF OVERVIEW OF WHAT'S IN THE PROJECT AND THEN YOU CAN OPEN THE HEARING, TAKE COMMENTS FROM THE PUBLIC THAT WE WILL RECORD AND REPRODUCE AND RESPOND TO, IN THE FINAL EIR/EIS WHEN WE GET THERE.

LET ME JUST DO A… CAN YOU… I'LL HAVE TO IMPROVISE A LITTLE BIT HERE. SO, WHAT WE ARE COVERING IN THE PHASE 3 PROJECT, IS THE WORK THAT WOULD GO ON ALONG THE EAST LEVEE OF THE SACRAMENTO RIVER. (I THINK THAT IS PRETTY GOOD) EAST LEVEE OF THE SACRAMENTO RIVER, BASICALLY JUST UPSTREAM OF ELVERTA ROAD, JUST DOWNSTREAM OF THE PRICHARD LAKE PUMP STATION, RD'S PUMP STATION, RD1000'S PUMP STATION THERE, AND THEN, CONTINUING ALONG THE EAST LEVEE, FOR ABOUT, A LITTLE MORE THAN 4 MILES, DOWN PAST I-5, THAT WOULD BE THE REACH ALONG THE SACRAMENTO RIVER AND IN ORDER TO CLEAR THE WAY FOR THAT LEVEE WORK TO BE DONE, WE WOULD BE LOCATING THIS LOWER PORTION OF THE ELKHORN IRRIGATION CANAL, THE NATOMAS CENTRAL MUTUAL WATER COMPANY IRRIGATION CANAL, FROM JUST NORTH OF THE GOLF COURSE, ALL THE WAY DOWN TO JUST THE OTHER SIDE OF ELKHORN BLVD., AND THEN WE WOULD ALSO BE RELOCATING OR CREATING, IN EFFECT, A NEW DRAINAGE CANAL; THE GIANT GARTER SNAKE DRAINAGE CANAL, RUNNING FROM AGAIN, JUST THE NORTHERLY EDGE OF THE GOLF COURSE FROM THE ELKHORN RESERVOIR THERE ALL THE WAY DOWN TO CONNECT TO THE RD1000 WEST DRAINAGE CANAL HERE AT I-5.

AND THIS FACILITY, AS I'VE DISCUSSED WITH THE BOARD IN THE PAST, WILL OFF SET THE RECONFIGURATION AND ESSENTIALLY ABANDONMENT OF THE AIRPORT WEST DITCH. THIS IS A DRAINAGE AND IRRIGATION DITCH THAT RUNS THROUGH THE AIRPORT OPERATION AREA ON SACRAMENTO INTERNATIONAL AIRPORT. AND WE WOULD BE SHIFTING THE FUNCTIONS OF THE AIRPORT WEST DITCH, WHICH CURRENTLY CARRY IRRIGATION WATER AND PROVIDE A DRAINAGE FUNCTION FOR PROPERTIES JUST TO THE WEST OF THE AIRPORT. THOSE IRRIGATION AND DRAINAGE FUNCTIONS ALONG WITH THE HABITAT VALUES THAT WE WOULD CREATE WOULD BE SHIFTED OVER TO THE GIANT GARTER SNAKE DRAINAGE CANAL AND THAT WOULD ALLOW US TO RECONFIGURE AND ESSENTIALLY TURN WHAT IS NOW A RELATIVELY DEEP DITCH WITH WATER THAT RUNS ALMOST CONTINUOUSLY THROUGH IT INTO A KIND OF A GRASSY SWALE, THAT WILL STILL PROVIDE SOME MINIMAL DRAINAGE ON THE AIRPORT, BUT WE WILL ELIMINATE IT AS A SIGNIFICANT DRAINAGE AND IRRIGATION FACILITY.

IN ORDER TO FINISH AND CONTINUE TO SUPPLY IRRIGATION WATER TO THE PROPERTIES JUST WEST OF THE AIRPORT, THIS PHASE OF THE PROJECT ALSO INVOLVES OUR

CONSTRUCTION OF SOME IRRIGATION FACILITIES TO IRRIGATE THAT LARGE PARCEL JUST TO THE WEST OF THE AIRPORT.

PHASE 3 ALSO INCLUDES SOME SIGNIFICANT IMPROVEMENTS ON THE EAST SIDE OF NATOMAS. SO SWITCH OVER TO THE EAST SIDE OF THE BASIN AND WE WOULD BE IMPROVING, STRENGTHENING AND ADDRESSING THE UNDER SEEPAGE AND STABILITY ISSUES ON THE PLEASANT GROVE CREEK CANAL, WHICH IS ABOUT A THREE MILE REACH CONNECTING FROM THE CROSS CANAL DOWN JUST PAST SANKEY ROAD WHERE IT HITS THE NATOMAS EAST MAIN DRAINAGE CANAL. SO THE PLEASANT GROVE CREEK CANAL WOULD BE SLIGHTLY RAISED FOR A HUNDRED-YEAR FLOOD PROTECTION AT THE VERY UPPER END HERE, WOULD HAVE SEEPAGE REMEDIATION WORK DONE AND THE LEVEE STABILIZATION WORK OF THE LEVEE SECTION WOULD BE WIDENED IN THAT UPPER REACH OF NATOMAS.

AND THEN SWITCHING TO THE LOWER PORTION OF THE NATOMAS EAST MAIN DRAIN, PHASE 3 INCLUDES IMPROVEMENTS TO THE WEST LEVEE CANAL, EXTENDING ESSENTIALLY FROM ELKHORN BLVD., DOWN PAST OUR PUMPING STATION HERE, NEAR DRY CREEK AND ALL THE WAY DOWN TO NORTHGATE BOULEVARD. IN THIS SHORT UPPER REACH BETWEEN ELKHORN AND THE PUMPING STATION WE ARE ESSENTIALLY FIXING A LEVEE STABILIZATION ISSUE, AND THE LEVEE WILL BE WIDENED SIMILAR TO WHAT WE ARE DOING WITH THE ADJACENT LEVEE OVER ON THE EAST SIDE, IT WON'T BE RAISED, BUT THE LEVEE SECTION WILL BE MADE WIDER TO MAKE THAT LEVEE MORE STABLE. AND THEN IN THE REACH FROM THE PUMPING STATION DOWN TO NORTHGATE WE ARE ADDRESSING UNDER SEEPAGE IN THAT REACH OF THE LEVEE, PARTICULARLY IN SPOTS WHERE PRE-EXISTING SPOTS WHERE DRY CREEK, ARCADE CREEK, OLD MAGPIE CREEK CROSS UNNDERNEATH THE LEVEE, AND WHERE THERE IS UNDER SEEPAGE POTENTIAL THERE.

SO THOSE ARE THE BASIC ELEMENTS IN THE PHASE THREE PROJECT, I SHOULD ALSO SAY THAT THERE ARE SOME PUMPING STATIONS THAT NEED TO BE ADJUSTED TO THE CHANGED LEVEE HEIGHT AND THAT WOULD BE RD1000'S PRICHARD LAKE PUMP STATION, WHICH WILL NEED TO BE RETRO FITTED AND IMPROVED TO GET OVER THE NEW LEVEE AND THE ELKHORN PUMPING STATION FOR NATOMAS CENTRAL MUTUAL WATER COMPANY THAT WILL HAVE TO BE RETRO FITTED AND IMPROVED TO ADJUST TO THE NEW HEIGHT OF THE SACRAMENTO RIVER EAST LEVEE.

THE DOCUMENT COVERS THE IMPACTS ASSOCIATED WITH THIS WORK. THE IMPACTS ARE I'M SURE, FAMILIAR TO THE BOARD AT THIS POINT. WE DO, BECAUSE OF THE EXTENT OF THE IMPROVEMENTS AND THE WIDTH OF THE FOOTPRINTS OF THE LEVEE IMPROVEMENTS, WHETHER WE LOOK AT THE ADJACENT LEVEE OR EVEN RAISING THE LEVEE IN PLACE, THERE ARE IMPACTS ON THE LANDSIDE OF THE LEVEE, LOSS OF WOODLANDS AND LOSS OF AGRICULTURAL LANDS, IMPACTS TO HABITAT ASSOCIATED WITH THOSE LANDS AND, OF COURSE, SIGNIFICANT SHORT-TERM CONSTRUCTION IMPACT, AIR QUALITY NOISE, DUST THAT ARE UNAVOIDABLE WITH A PROJECT OF THIS SIZE.

THE DOCUMENT, AS WE HAVE IN THE PAST COMPARES ESSENTIALLY THREE ALTERNATIVES. ONE IS NO ACTION. AND NO ACTION IN THIS CONTEXT MEANS WE WILL HAVE COMPLETED THE PHASE 2 PROJECT WHICH THE BOARD RECALLS IS THE PROJECT TO IMPROVE THE CROSS CANAL RAISE AND STRENGTHEN THE CROSS CANAL WALLS, ALL 5.3 MILES OF IT AND TO DO THE UPPER REACHES OF THE SACRAMENTO RIVER EAST LEVEE. SO WE COME DOWN TO JUST PAST THE PUMPING STATION JUST NORTH OF ELVERTA ROAD. IT'S ASSUMED IN THIS DOCUMENT THAT, PHASE TWO, WHICH THIS BOARD CERTIFIED THE FIRST ENVIRONMENTAL DOCUMENT IN NOVEMBER AND WE DID A SUPPLEMENTAL DOCUMENT IN JANUARY, IN WHICH THE CORPS ISSUED A RECORD OF DECISION ON IN JANUARY, THAT THAT WORK WILL GO FORWARD BUT UNDER THE NO ACTION ALTERNATIVE; NO ADDITIONAL WORK WOULD BE DONE. AND SO UNDER THAT ALTERNATIVE, WHICH IS NECESSARY TO CONSIDER UNDER NEPA AND CEQA FOR THIS PURPOSE, IT WOULD BE ASSUMED THAT WOULD BE NECESSARY TO BRING THE SACRAMENTO RIVER EAST LEVEE INTO COMPLIANCE WITH THE CORP VEGETATION AND ENROACHMENT STANDARDS, WHICH UNDER THE NO ACTION ALTERNATIVE WOULD REQUIRE A

SUBSTANTIAL REMOVAL OF VEGETATION AND ENCROACHMENTS ALONG THE EAST LEVEE, TO MEET CORPS CRITERIA.

THOSE IMPACTS WOULD BE AVOIDED UNDER THE SECOND ALTERNATIVE THAT WE'RE LOOKING AT, WHICH THE BOARD IS FAMILIAR WITH AND WHICH IS IN FACT THE ALTERNATIVE THAT IS THE PREFERRED PLAN FOR SAFCA, WHICH IS THE ADJACENT LEVEE ALTERNATIVE. AND OF COURSE UNDER THE ADJACENT LEVEE ALTERNATIVE WE ESSENTIALLY BUILD A NEW LEVEE DIRECTLY CONNECTED TO AND ADJACENT TO THE GARDEN HIGHWAY LEVEE ON THE EAST SIDE, AND THAT AVOIDS THE NEED TO REMOVE VEGETATION AND ENCROACHMENTS ALONG THE SACRAMENTO RIVER EAST LEVEE, BUT OF COURSE, IT HAS MORE IMPACTS ON THE LAND SIDE OF THE LEVEE BECAUSE IT CONSUMES MORE LAND, SO THERE ARE MORE LANDSIDE WOODLANDS IMPACTS ASSOCIATED WITH THAT ALTERNATIVE, MORE LOSS OF AGRICULTURAL LANDS ASSOCIATED WITH THAT ALTERNATIVE. BUT, WE WOULD AVOID THE LOSS OF WOODLANDS, RIPARIAN HABITAT ON THE WATERSIDE OF THE LEVEE AND WOULD AVOID THE NEED TO REMOVE ENROACHMENTS, RESIDENTIAL ENROACHMENTS, IN PARTICULAR, ALONG THE WATERSIDE OF THE GARDEN HIGHWAY.

THE THIRD ALTERNATIVE AS IN THE PREVIOUS DOCUMENTS IS; RAISE THE LEVEE IN PLACE. SO UNDER THAT ALTERNATIVE, RATHER THAN BUILD THE RAISED ADJACENT LEVEE CONNECTING TO THE EXISTING GARDEN HIGHWAY, IT WOULD ESSENTIALLY, RAISE AND STRENGTHEN THE EXISTING GARDEN HIGHWAY LEVEE, WHICH WOULD HAVE MORE SEVERE IMPACTS ON THE VEGETATION AND ENCROACHMENTS ON THE WATERSIDE, BECAUSE YOU WOULD HAVE TO COMPLY WITH THE CORP STANDARDS AND OF COURSE THE SHORT-TERM CONSTRUCTION IMPACTS FOR FOLKS LIVING AND RELYING ON THE GARDEN HIGHWAY FOR TRANSIT WOULD BE MUCH MORE SEVERELY AFFECTED, BY THE RAISE-IN-PLACE ALTERNATIVE.

UNDER NEPA, THESE ALTERNATIVES NEED TO BE VIEWED ESSENTIALLY AT AN EQUAL LEVEL OF DETAIL AND ANALYSIS AND SINCE THIS DOCUMENT IS PROVIDING THE NEPA COMPLIANCE FOR THE CORPS DECISION MAKING, AND THE CORPS DECISION MAKING HERE AS THE BOARD WILL RECALL - IS THE CORPS HAS TO DECIDE TO GIVE SAFCA A PERMIT UNDER SECTION 408 OF THE RIVERS AND HARBORS ACT OF 1899 TO PHYSICALLY ALTER THE STATE PROJECT LEVEE AND THE CORPS HAS TO GIVE US A PERMIT TO FILL WETLANDS, AND THERE ARE SOME WETLANDS FILLED AS A PART OF THIS PROJECT, DEPENDING ON OUR ALTERNATIVE. SO IT WILL SERVE THE CORP'S DECISION-MAKING PROCESS FOR THE ISSUANCE OF THOSE PERMITS AND OF COURSE, IT WILL PROVIDE CEQA COMPLIANCE FOR SAFCA AND FOR THE CENTRAL VALLEY FLOOD CONTROL BOARD AND OTHER STATE AGENCIES WHO HAVE TO ACT IN CONNECTION WITH THIS PROJECT.

THE DOCUMENT WAS ISSUED ON FEBRUARY 13TH. THE COMMENT PERIOD WILL REMAIN OPEN UNTIL APRIL 6TH, AT WHICH POINT THE COMMENT PERIOD WILL THEN CLOSE, WE WILL RESPOND TO ALL THE COMMENTS THAT WE RECEIVE AND WE WILL PREPARE AND BRING TO THE BOARD A FINAL EIR SOMETIME PROBABLY IN MAY.

THE CORP WILL DO ITS OWN DECISION-MAKING PROCESS AND THEIR RECORD OF DECISION TYPICALLY IS ISSUED SOMETIME AFTER WE'RE READY TO CERTIFY UNDER CEQA. SO THAT'S THE PROCESS. I WOULD BE HAPPY TO ANSWER ANY QUESTIONS THAT THE BOARD MAY HAVE AND THEN WE COULD OPEN THE PUBLIC HEARING AND TAKE ANY PUBLIC COMMENTS THAT THERE MAY BE.

CHAIR SUSAN PETERS:
ANY QUESTIONS FROM THE BOARD AT THIS TIME? THANK YOU.

ANOTHER MOMENT AND WE WILL OPEN THE PUBLIC HEARING. I ONLY HAVE ONE REQUEST TO SPEAK, SO IF YOU ARE HERE AND YOU WANT SPEAK, PLEASE FILL OUT THE FORM, ITS AT THE BACK TABLE. CHRISTOPHER BARABINO.
PLEASE NOTE THAT WE HAVE A THREE MINUTE LIMIT.

CHRISTOPER BARABINO:
GOOD AFTERNOON, MY NAME IS CHRISTOPHER BARABINO. MY WIFE AND I HAVE LIVED AT 5871 GARDEN HIGHWAY FOR SIX YEARS. WE OWN A SMALL SEASONAL BUSINESS ON THE RIVER LOCATED AT THE SAME ADDRESS. SINCE THE NEWS OF THE PENDING LEVEE PROJECT, I'VE BEEN TO MEETINGS, SPOKE TO THE BOARD OF SUPERVISORS. I'VE WRITTEN NUMEROUS LETTERS AND HAD IN PERSON MEETINGS TO ADDRESS CONCERNS.

AFTER RECENTLY REVIEWING THE DRAFT 3 EIR, PRINTED THIS FEBRUARY, I'M CONCERNED ON A NUMBER OF ISSUES. FIRST I'D LIKE TO MAKE IT CLEAR THAT WE'RE NOT, OUR COMPANY AND WHERE WE'RE LIVING AT, WE'RE NOT IN THE BUSINESS OF TRYING TO FIGURE SOME HANDOUT FROM SAFCA, OR ANY AGENCIES, I ALSO WOULD LIKE TO MAKE IT CLEAR THAT WE'RE NOT NECESSARILY AGAINST THE LEVEE PROJECT GOING IN FOR NATOMAS, TO PROTECT ITS RESIDENTS. PH-1

WHAT WE ARE FOR IS A RESPONSIBLY RAN PROJECT THAT MITIGATES FAIRLY. THE LATEST EIR ADDRESSED NONE OF MY PRIOR CONCERNS AND IN FACT, WAS FAR WORSE THAN PREDICTED. EVEN MORE SURPRISING IS THAT ANOTHER BUSINESS TO THE NORTH, TEAL BEND GOLF COURSE RECEIVED MENTIONS IN THE EIR ABOUT STAYING OPEN, EVEN THOUGH I'VE NEVER SEEN A REPRESENTATIVE OR COMMUNICATION FROM THEM. SUGGESTING THAT THE ENTIRE MARINA, RESTAURANT AND BOAT LAUNCH CLOSE DOWN AT SOME RANDOM DATE FOR TWO MONTHS IN THE MIDDLE OF THE SUMMER AND TELLING EVERYONE JUST TO GO ELSEWHERE, WOULD BE CONSIDERED A TOTAL SHUT DOWN FOR OUR 2010 SEASON. THIS SHUT DOWN WOULD NOT ONLY INCLUDE OUR RESTAURANT BUT ALSO ASSOCIATED BUSINESSES, RESIDENT RENTAL INCOME, MARINA INCOME. PH-2

I CAN'T SPEAK FOR THE MARINA AND RESTAURANT NEXT DOOR. BUT I WOULD ASSUME THEY'RE IN THE SAME BOAT. I FEEL THIS WOULD BE AN EXPENSIVE PROPOSITION BETWEEN THE TWO BUSINESSES AND THE BOAT LAUNCH, AND ESTIMATED $2.0 MILLION WORTH OF REVENUES FOR TAXES AND LOCAL MONEY SPENT, AND JOBS WOULD BE LOST FOR THAT SEASON. I THINK IT'S IMPORTANT THAT WE FIND WAYS TO KEEP THE TRAFFIC FLOW AROUND THESE BUSINESSES AND THE BOAT LAUNCH FLOWING. I THINK THERE ARE WAYS FOR US TO CONNECT THE PROPERTIES WITH THE BOAT LAUNCH AND OUR RESTAURANT PROPERTY TO ALLOW ENTRANCE FROM BOTH SIDES OF THE GARDEN HIGHWAY NORTH AND SOUTH, ON THE NORTH BAYOU ROAD. PH-3

I FEEL IT'S ONLY FAIR THAT IT'S TIME TO START GETTING SOME OF THE STATEMENTS THAT I'VE RECEIVED IN THE PAST VERBALLY AND IN WRITING, TELLING US WHAT TO EXPECT FOR THE FUTURE IN 2010. IF AGENCIES FEEL THAT WE'RE NOT GOING TO HAVE ANY INTERRUPTION WITH OUR POWER AND OUR WELL WATER ISN'T GOING TO BE AFFECTED, I THINK IT'S TIME TO GET THAT IN WRITING. IF AGENCIES ARE GOING TO PROMISE THAT WE'RE GOING TO HAVE ACCESS, I THINK IT'S TIME TO START GETTING THAT IN WRITING SO WE CAN START PLANNING OUR BUSINESS YEAR IN 2010. IT IS MY SINCEREST HOPE THAT WE CAN BUILD A PLAN THAT WORKS FOR EVERYONE AND ANY NEGATIVE BUSINESS IMPACTS ARE MINIMIZED. THANK YOU FOR YOUR TIME. PH-4

CHAIR SUSAN PETERS:
THANK YOU MR. BARABINO. COULD YOU PAUSE FOR A QUESTION?
TURN YOUR MICROPHONE ON…

CHRISTOPHER BARABINO:
I'M SOUTH 0F ALAMAR. IT'S RIGHT NEXT TO THE ELKHORN BOAT LAUNCH.

DIRECTOR (DON'T KNOW WHO SPOKE)
OKAY THANK YOU.

CHAIR SUSAN PETERS:

TURN YOUR MICROPHONE ON.
THANK YOU. DID YOU WANT TO RESPOND TO COMMENTS AT THIS TIME?

TIM WASHBURN:
NO, WE ARE TAKING COMMENTS AND WE WILL RESPOND TO THESE COMMENTS IN THE FINAL EIS/EIR AND I WOULD CERTAINLY BE HAPPY TO, ONCE WE HAVE TAKEN ALL THE COMMENTS, RESPOND TO ANY QUESTIONS THE BOARD MAY HAVE.

CHAIR SUSAN PETERS:
OKAY. THANK YOU, STAY TUNED. NEXT SPEAKER IS CHRIS MCKENZIE?

CHRIS MCKENZIE
YES. THANK YOU FOR HAVING THIS HEARING AND ALLOWING ME TO SPEAK. I'VE PREPARED A BRIEF STATEMENT, BECAUSE THEY ARE NUMEROUS QUESTIONS, AND LOTS OF DETAILS INVOLVED, AND THE REPORTS, THEY ARE THIS THICK (HAND MOTION) AND I ….

CHAIR SUSAN PETERS:
MR. MCKENZIE FOR THE RECORD, COULD YOU IDENTIFY YOURSELF?

CHRIS MCKENZIE
OH YES. MY NAME IS CHRIS MCKENZIE, I LIVE AT 6641 PLEASANT GROVE ROAD, IN PLEASANT GROVE, WHICH IS IN SUTTER COUNTY. I'M A LONG TIME RESIDENT OF SUTTER COUNTY, I HAVE ABOUT 160 ACRES JUST EAST OF THE PLEASANT GROVE CREEK CANAL AND NORTH OF SANKEY ROAD.

PH-5

I'M VERY CONCERNED ABOUT THE ASPECTS OF THIS EXPENSIVE PROJECT, AND ITS APPARENT ADVERSE IMPACT ON ALL PROPERTIES WHICH RELY ON THE PLEASANT GROVE CREEK CANAL, NATOMAS CROSS CANAL AND SACRAMENTO RIVER SYSTEM FOR DRAINAGE. THE APPARENT DESIGN IS TO HOLD THE WATER AT A HIGHER LEVEL, FOR A LONGER TIME, OUTSIDE OF THE BASIN. THE DOCUMENTS PRESENT - APPEAR TO INDICATE THAT THE IMPACT OF, UH NO, WAIT, JUST A SECOND, THE DOCUMENTS PRESENTED APPEAR TO INDICATE THE DESIGN WILL RESULT IN HIGHER FLOOD LEVELS IN THAT CANAL, AT EACH EVENT AND RESTRICTED FLOW VOLUMES. AND THESE ARE QUOTES, OF COURSE. THIS IS THE RESULT OF RESTRICTIONS IN THE CROSS SECTIONAL AREA, BACKFILLS AND FLOODPLAIN PLANTING ZONES.

THE IMPACT ON DRAINAGE OF A SMALL INCREASE IN HIGH WATER ELEVATIONS AND FLOW RESTRICTIONS HAVE NOT BEEN DISCUSSED OR COMMENTED UPON SPECIFICALLY IN THE PLEASANT GROVE CREEK CANAL. ACTUAL EXPERIENCE HAS SHOWN THAT A RELATIVELY MINOR ELEVATION AT THE SACRAMENTO RIVER, DRAMATICALLY AFFECTS THE UPSTREAM DRAINAGE. IN 1986, 1995, 2003, ET CETERA. DETAILED MODELING IS NEEDED ON THE PLEASANT GROVE CREEK CANAL AND THE NATOMAS CROSS CANAL DRAINAGE. THIS NEEDS TO INCLUDE NEW AND UNMITIGATED DRAINAGE DEMANDS OF THE NUMEROUS NEW AND PLANNED COMMUNITIES IN PLACER COUNTY.

PH-6

I DON'T KNOW IF YOU'RE AWARE OF IT, BUT VIRTUALLY EVERYTHING FROM THE MIDDLE OF AUBURN, DRAINS INTO THE PLEASANT GROVE CREEK CANAL AND THE NATOMAS CROSS CANAL. I'M ALSO CONCERNED ABOUT SPECIFIC IMPROVEMENTS NOT DETAILED ALONG PLEASANT GROVE CREEK CANAL AND HOW THESE MIGHT AFFECT EXISTING SANKEY ROAD, HOW THEY MIGHT AFFECT THE EXISTING SANKEY ROAD OVERFLOW GAP WESTWARD INTO NATOMAS AND SOUTH ALONG THE EAST MAIN DRAIN. WILL THE LEVEES BE EXTENDED TO THE EAST TO ACCOMMODATE FOR THE HIGHER WATER ELEVATIONS? WILL PROPERTY BE PURCHASED AND HOMES IN THE AREA FLOOD PROOFED? OR, WILL THERE BE PUMPS INSTALLED? IT'S NOT CLEAR. THE MAPPING AS PRESENTED IN THE FLYER DOES NOT INDICATE WHETHER EAST SIDE LEVEE IMPROVEMENTS WILL BE MADE IN ADDITION TO THE WEST SIDE LEVEE IMPROVEMENTS.

PH-7

PH-8

ANOTHER COMMENT, THE FLOODPLAIN PLANTINGS PRESENT OBVIOUS CONCERNS FOR THOSE OF US WHO NEED THE SYSTEM TO CONTINUE TO WORK. HOW WILL THE GROWTH OF TREES AND BRUSH BE MAINTAINED? WHAT CRITERIA WILL BE USED TO ENSURE ADEQUATE FLOOD STAGE FLOWS AND ARE THE MAINTENANCE FUNDS BUDGETED AND BONDED? PH-9

CONSIDER THE WIDESPREAD FLOODING IMPACTS IN 1986 AS A RESULT OF NOT CONTROLLING THE OVERGROWTH IN A RELATIVELY SMALL ACREAGE AT FREMONT WEIR. THE CORPS, AND SAFCA WILL UNDERSTAND THAT.

AND SECONDLY, WHAT HAPPENS IN FIVE OR TEN YEARS WHEN THE COTTONWOOD TREES AND ELDERBERRIES - NEED TO BE REMOVED TO MAINTAIN WATER FLOW? DO WE GET ANOTHER EIR/EIS AND HOW MANY DOLLARS WILL THAT COST AND STRUCTURES ON ENDANGERED SPECIES THAT ARE NOT THERE NOW AND WE WOULD CREATE HABITAT FOR? PH-10

I THANK YOU FOR THE OPPORTUNITY TO EXPRESS MY CONCERNS AND OPINIONS. BUT WITH THE DIRECT IMPACTS THIS PROJECT WILL HAVE ON MY PROPERTY. BY THE WAY, IN 1986 I BUILT MY HOUSE APPROXIMATELY A FOOT HIGHER IN 1985, APPROXIMATELY A FOOT HIGHER THAN WAS REQUIRED BY SACRAMENTO COUNTY. THE 1986 FLOOD WAS WITHIN 18 INCHES OF INUNDATING THE HOUSE. WHEN THE WATER -- WHEN THE FLOOD LEVEL PEAKED AT SACRAMENTO, WE HAD ALMOST 400- ACRE FEET OF WATER ON MY PROPERTY, IN SIX HOURS, WITH A 6-INCH VARIATION IN ELEVATION AT SACRAMENTO RIVER, THAT WATER LEFT. PH-11

CHAIRS SUSAN PETERS:
THANK YOU MR MCKENSIE. IF YOUR COMMENTS ARE TYPED, GIVE THEM TO THE CLERK, THAT WOULD BE HELPFUL.

THANK YOU. NEXT SPEAKER IS BRUCE SEVIER

BRUCE SEVIER:
HELLO, MY NAME IS BRUCE SEVIER AND I'M AT 7283 GARDEN HIGHWAY. THERE'S NOT MANY HOMEOWNERS HERE BECAUSE I THINK THEY'VE KINDA GIVEN UP ON THE PROJECT, AS FAR AS THE AFFECT TO HOMEOWNERS ALONG THE RIVER. WE RECOGNIZE THERE'S BEEN AN EFFORT TO CUT BACK, TAKING THE TREES OFF THE RIVER. BUT THEN WHEN YOU LOOK AT THE LANDSIDE PART, IT'S GOING TO REALLY DEVASTATE A LOT OF THE AREA. PH-12

ONE STATEMENT THAT WAS JUST MADE IN THE REPORT WAS RAISING THE PUMPING STATIONS, AND I HAVE A QUESTION ABOUT THAT. ARE THEY BEING RAISED TO A HIGHER LEVEL BECAUSE THE LEVEE IS GOING TO BE HIGHER? AND IF THAT'S THE CASE, WHEN WE BUILT OUR HOME AND IT WAS FINISHED IN 2002. WE BUILT IT AT 200 YEAR FLOODPLAIN LEVEL, WHICH WAS ABOUT THREE QUARTERS OF A FOOT HIGHER THAN THE LEVEE ROAD. SO, THAT MEANS THAT WE ARE NOW IN DANGER OF BEING FLOODED. IF YOU READ THE PAPER TODAY, THERE'S A DISCUSSION ABOUT OTHER LEVEES IN THE AREA BEING RAISED WITH SIMILAR CONCERNS AS TO THIS PROJECT. PH-13

WE'VE BEEN TOLD IN PRIOR MEETINGS THAT PROBABLY THE OTHER LEVEES WOULD NOT BE RAISED AND WE SHOULD NOT BE CONCERNED ABOUT THAT. I AM. AND I THINK A LOT OF OTHER HOMEOWNERS WOULD BE AS WELL. I KNOW THERE'S A MINORITY OF US COMPARED TO MANY THOUSANDS OF PEOPLE THAT LIVE ON THE OTHER SIDE OF THE LEVEE. BUT THEN AGAIN, WHEN THOSE HOMES WERE BUILT WHO APPROVED THAT? I MEAN, THEY KNEW IT WAS IN A FLOODPLAIN. SO ANYWAY, I GUESS MY QUESTION WOULD BE, IF WE'RE GOING TO BE RAISING THE PUMPING FACILITY, THEN MAYBE WE SHOULD BE RAISING OUR HOMES AS WELL, TO KEEP US OUT OF THE FLOODPLAIN. PH-14

CHAIR SUSAN PETERS:
THANK YOU.
ED BIANCHI.

THAT'S THE LAST SPEAKER SHEET I HAVE, IF THERE'S ANYONE ELSE HERE WHO WISHES TO SPEAK..

ED BIANCHI:
I'M ED BIANCHI, FROM 7050 GARDEN HIGHWAY, NATOMAS AREA. I'VE GOT A COUPLE CONCERNS ABOUT THE DESIGN OF THE IRRIGATION FACILITIES AND THE AMOUNT OF GROUND BEING TAKEN FOR THIS PROJECT. ORIGINALLY IT WAS GOING TO BE AROUND 350 ACRES. I HAD SAFCA COME OUT AND MARK OFF MY PROPERTY AND IT'S BETWEEN 420 AND 460 FEET FROM THE TOE OF THE LEVEE. I UNDERSTAND THERE'S WHATEVER IS NEEDED FOR THE LEVEE AND THE MAINTENANCE ROAD IS ONE THING. BUT THEN IT BECOMES A PROBLEM WITH THE BIG DITCH THAT IS GOING TO BE SERVING LESS PROPERTY, THAT IS GOING TO HAVE HABITAT ADJACENT TO THE LANDSIDE, THAT WE FOUND IS NOT NECESSARY. IT WOULD PUT ANOTHER BURDEN ON THE FARMING OUT THERE IF THERE'S A HABITAT BETWEEN THE TOE OF THE DITCH, THE IRRIGATION DITCH AND OUR PROPERTIES. THAT'S MY MAIN CONCERN RIGHT NOW THAT I HAVE. I THINK SOMEONE OUGHT TO TALK US, SOMEONE BESIDES THE WATER COMPANY, OUT THERE BY WHO'S GONNA BE AFFECTED BY IT, THE FARMERS, OR WHOEVER

PH-15

PH-16

CHAIR SUSAN PETERS:
OKAY, ANY QUESTIONS FOR MR. BIANCHI? THANK YOU. MR WASHBURN, COULD YOU, THIS WOULD BE A GOOD OPPORTUNITY TO EXPLAIN HOW PEOPLE HAVE THEIR QUESTIONS ANSWERED AND ANYONE WHO'S WATCHING, IF THEY HAVE ADDITIONAL QUESTIONS, THEY HAVE UNTIL APRIL 6TH TO GET THEM IN.

TIM WASHBURN:
RIGHT AND UH,

CHAIR SUSAN PETERS:
IF YOU COULD EXPLAIN, PARTICULARLY TO THE FOLKS THAT TOOK THE TIME TO COME DOWN TODAY, HOW THEIR QUESTIONS WILL BE ANSWERED.

TIM WASHBURN:
THESE COMMENTS THAT WE'VE RECEIVED TODAY, WE WILL RECORD, REPRODUCE IN THE FINAL EIR/EIS AND PROVIDE A SPECIFIC RESPONSE TO EACH OF THE COMMENTS THAT WERE RAISED HERE TODAY. AND OF COURSE, EVERYONE IS FREE TO SUBMIT ADDITIONAL WRITTEN COMMENTS UP THROUGH APRIL 6TH EITHER TO SAFCA OR TO THE ARMY CORPS OF ENGINEERS. THE ADDRESSES ARE SET FORTH IN THE DOCUMENT ON OUR WEBSITE, AT WWW.SAFCA.ORG AND SO WE WILL BE RECEIVING WRITTEN COMMENTS THROUGH APRIL 6TH AND WE WILL RESPOND TO THE COMMENTS THAT WERE MADE TO THE BOARD HERE TODAY, AND IF THE BOARD WOULD LIKE, I DON'T KNOW IF YOU'RE INTERESTED IN ANY RESPONSE TO THE COMMENTS THAT HAVE BEEN MADE ON A PRELIMINARY BASIS OR NOT. THAT'S UP TO THE BOARD.

CHAIR SUSAN PETERS:
ANY QUESTIONS? MR. DICKINSON.

ROGER DICKINSON:
I HAVE ONE I WANTED TO FOLLOW UP ON. BUT I THINK IN GENERAL AS FAR AS I'M CONCERNED THERE DOESN'T NEED TO BE A RESPONSE TODAY. I DO THINK THAT, OF COURSE, AS WE RESPOND TO THESE COMMENTS WE NEED TO --BESIDES PUTTING THEM IN THE FINAL, WE SHOULD LET PEOPLE KNOW INDIVIDUALLY WHAT THE RESPONSE IS. BUT I WANT TO GO BACK TO, MR GARDINO? OUR FIRST..

CHAIR SUSAN PETERS:
BARABINO.

ROGER DICKINSON:
GARABINO?

CHRIS BARABINO:
BARABINO.

ROGER DICKINSON
BARABINO. THANK YOU, I'M SORRY,

CHAIR SUSAN PETERS:
??? MUCH (ROGER TALKING OVER HER, COULDN'T GET FIRST WORD)

ROGER DICKINSON:
YES. HE MAY HAVE ENVIRONMENTAL ISSUES THAT HE WANTS TO GET ON THE RECORD. I DIDN'T HEAR THINGS OF THAT NATURE. BUT WHAT I DID HEAR WAS A CONCERN ABOUT BUSINESS INTERRUPTION.

CHRIS BARABINO:
RIGHT.

ROGER DICKINSON:
AND I DON'T KNOW IF BARB HAS BEEN IN CONTACT WITH HIM OR NOT. BUT IN ANY CASE, WHETHER OR NOT WE CERTAINLY SHOULD BE WORKING TO GIVE HIM AS MUCH CERTAINTY, AS WELL AS THE OTHER BUSINESS OWNERS, THAT WILL BE AFFECTED, AS MUCH CERTAINTY, SO THEY CAN PLAN FOR WHATEVER THE INTERRUPTION MIGHT BE, AND OBVIOUSLY THAT'S AN ISSUE THAT WE HAVE TO TAKE INTO ACCOUNT AS A PRACTICAL MATTER WITH RESPECT TO THE FINANCIAL CONSIDERATIONS, WE'RE OBVIOUSLY INTERESTED FOR A HOST OF REASONS IN TRYING TO MINIMIZE BUSINESS INTERRUPTION. BUT I JUST WANTED TO MAKE SURE THAT WE'RE EITHER IN CONTACT WITH HIM AND TRYING TO ADDRESS HIS LEGITIMATE CONCERNS, OR WE WILL BE, PROMPTLY.

STEIN BUER:
THE ANSWER IS WE'VE BEEN HAVING ONGOING DISCUSSIONS WITH HIM.

ROGER DICKINSON:
OKAY, THAT'S GOOD. AND I UNDERSTAND HE WOULD LIKE THINGS THAT HAVE BEEN VERBALIZED TO BE REDUCED TO WRITING, AND IT MAY NOT BE POSSIBLE TO DO THAT WITH THE SPECIFICITY NOW, BUT I DO THINK THE UNDELYING CONCERN IS LEGITIMATE, OF HAVING, AS EARLY AS POSSIBLE, A CLEAR AND RELIABLE SENSE OF SCHEDULE, SO THAT HE CAN MAKE SUITABLE AND APPROPRIATE PLANS AS HIS FELLOW BUSINESS, AS CAN HIS FELLOW BUSINESS PEOPLE WHO ARE IN AN UNCERTAIN AMOUNT OF --WE HAVE A CERTAIN AMOUNTY OF UNCERTAINTY OURSELVES I SUPPOSE, BECAUSE OF THE NATURE OF THE FLOW OF FUNDING. BUT THAT'S WHAT WE NEED TO TRY TO REDUCE AS MUCH AS WE CAN, I THINK.

CHAIR SUSAN PETERS:
I AGREE WITH YOUR ROGER, IN A SEASONAL BUSINESS YOU REALLY NEED TO KNOW AT LEAST A SEASON AHEAD, IF AT ALL POSSIBLE, WHAT IS GOING TO BE HAPPENING WITH YOUR BUSINESS, RECOGNIZE THAT, ANY FURTHER QUESTIONS?

JAMES GALLAGHER:
MADAM CHAIR

CHAIR SUSAN PETERS:
MR. GALLAGHER?

JAMES GALLAGHER:
YAH, I HAVE A COUPLE QUESTIONS.

ONE, JUST A CLARIFICATION, TIM, AS FAR AS THE SANKEY GAP, ON PHASE THREE PROJECT, THAT IS NOT PROPOSED TO BE CLOSED OFF DURING THIS PROJECT, RIGHT?

TIM WASHBURN:
THAT'S CORRECT.

JAMES GALLAGHER:
AND I THINK MR. MCKENZIE RAISED SOME IMPORTANT ISSUES REGARDING THE FLOW RESTRICTIONS IN PLEASANT GROVE CREEK AND NATOMAS CROSS CANAL. I DIDN'T REALLY SEE THAT IN WHAT I HAD READ IN THE EIR. BUT DOES THAT --HAVE WE DOCUMENTED WHAT IMPACT IF ANY THAT WILL HAVE ON FLOW IN THE CANAL AND THE NATOMAS CROSS CANAL?

TIM WASHBURN:
AGAIN, ON THE EAST SIDE OF NATOMAS, AS ON THE SACRAMENTO RIVER, OUR IMPROVEMENTS ARE ALL TO THE LANDSIDE, IN ORDER TO AVOID GOING WATERSIDE, WE'RE WIDENING THE LEVEE TO THE LANDSIDE. SO I CERTAINLY NEED TO FOLLOW-UP WITH MR. MCKENZIE TO FIND OUT WHAT THE FLOW RESTRICTION ISSUE IS, BECAUSE AS I UNDERSTAND, THE PROJECT HERE, EVERYTHING IS KINDA ON THE LANDSIDE WITH NO CHANGE IN THE CHANNEL CONFIGURATION WATERSIDE. I'LL FOLLOW UP WITH MR. MCKENZIE.

CHAIR SUSAN PETERS:
OKAY, GOOD.

JAMES GALLAGHER:
OKAY, AND THEN THIS IS MY LAST QUESTION, WITH REGARD TO THE ISSUE ABOUT HABITAT, OBVIOUSLY WE HAVE TO DO A CERTAIN AMOUNT OF MITIGATION AS WE'RE GOING FORWARD WITH THIS PROJECT AND IN TERMS OF ADDRESSING, YOU KNOW A LOT OF TIME WHEN WE PUT THESE BUFFER ZONES OR HABITAT AREAS RIGHT NEXT TO AN AGRICULTURAL AREA, THOSE HABITAT AREAS OR BUFFER ZONES CAN BECOME, YOU KNOW, KIND OF A HOME PLACE FOR PESTS THAT CAUSE PROBLEMS FOR OUR AGRICULTURAL INTERESTS. SO, I MEAN, WE MAY IN THE FINAL, JUST NEED TO THINK HOW WE CAN ADDRESS THOSE POTENTIAL CONFLICTS.

TIM WASHBURN
WHAT I BELIEVE MR. MCKENZIE WAS REFERRING TO IS THE GRASS LANDS THAT WOULD BE PLACED ON TO THE LANDSIDE OF THE IRRIGATION CANAL BERM. SO IT'S A PERENNIAL NATIVE GRASS THAT DOES PROVIDE SOME HABITAT VALUE, BUT IT'S NOT A SUBSTANTIAL ENVIRONMENTAL FEATURE IN THAT RESPECT. THERE ARE ALSO WOODLANDS IN HIS AREA, BUT THEY WOULD TEND TO BE ON THE LANDSIDE OF THE CANAL. SO WHAT IS IMMEDIATELY ADJACENT WOULD BE THE GRASS LANDS ON THE BERM OF THE IRRIGATION CANAL.

JAMES GALLAGHER:
OKAY.

CHAIR SUSAN PETERS:
OKAY. ANY OTHER QUESTIONS FROM THE BOARD?

OKAY, JUST TO REPEAT TO ANYBODY WHO IS IN THE AUDIENCE OR WATCHING, THE COMMENTS WILL BE RESPONDED TO IN THE FINAL EIS AND EIR AND THE FEIR WILL BE PRESENTED TO THE BOARD IN LATE SPRING OR EARLY SUMMER, SO YOU HAVE STILL HAVE UNTIL APRIL 6TH, AT 5:00 P.M., TO COMMENT, SO THAT YOUR QUESTIONS ARE ANSWERED IN THE FINAL DOCUMENT.

SO WE'LL CLOSE THE PUBLIC HEARING AND MOVE ON

CLERK:
NEXT UP, WE HAVE CONSENT MATTERS, MADAM CHAIR THEY ARE IN ORDER.

CHAIR SUSAN PETERS:
DOES ANYBODY HAVE ANY QUESTIONS ABOUT CONSENT OR WANT TO PULL ANYTHING?

PH-1 See Responses to Comments PH-2 through PH-4.

PH-2 As stated in the Phase 3 DEIS/DEIR, although a section of Garden Highway would be closed for approximately 8–12 weeks during the summer season to allow for the construction of a cutoff wall in the Sacramento River east levee (adjacent to the I-5 Bridge), access would be maintained to the two nearby marinas. However, as stated under Impacts 4.2-c, "Potential to Physically Divide or Disrupt an Established Community," and 4.15-b, "Temporary Changes in Recreational Opportunities during Project Construction Activities," in the Phase 3 DEIS/DEIR, overall, these temporary disruptions during project construction are considered to be a significant impact. As such, USACE and SAFCA are committed to maintaining good communications with potentially affected residents and business owners throughout project planning and construction, and meeting with those affected to discuss individual concerns.

PH-3 See Response to Comment PH-2. Access to the two private marinas near the I-5 Bridge would be maintained. However, the construction of a cutoff wall in the Sacramento River east levee would prevent access to Sacramento County's Elkhorn Boat Launching Facility at this location (Reach 9B).

PH-4 Comment noted. As previously stated, USACE and SAFCA are committed to maintaining good communications with affected residents and business owners throughout project planning and construction, and meeting with those affected to discuss individual concerns.

PH-5 This is not a comment on the Phase 3 DEIS/DEIR.

PH-6 The channel structure of the PGCC would not be altered; therefore, hydraulic changes would not occur as a result of the Proposed Action. The information regarding hydraulic changes presented by the commenter refer to the NCC discussion contained in the Phase 2 EIS and do not apply to the PGCC. See also Response to Comment PH-8.

With regard to the commenter's modeling comment, a UNET hydraulic computer model was used to compare existing conditions in the waterways surrounding the Natomas Basin and in the larger SRFCP with and without the Proposed Action (With Project and Without Project [i.e., No-Action Alternative], respectively) and other reasonably foreseeable improvements to Folsom Dam and the urban levees outside the Natomas Basin. Table 4.4-1 in the Phase 3 DEIS/DEIR summarizes the conditions and assumptions associated with each of the model runs. The modeling outputs generated by these conditions under the targeted flood scenarios are displayed in Tables 4.4-2 through 4.4-8 in the Phase 3 DEIS/DEIR.

PH-7 The Phase 3 Project includes raising of the PGCC west levee to meet "200-year" FEMA levee height requirements, slope flattening and widening, and seepage remediation, as discussed in Chapter 2.0, "Alternatives," and Appendix H of the Phase 3 DEIS/DEIR. The lower height levee segments at Howsley and Sankey Roads would remain at their current elevations, thereby not causing any project-related changes in flood stages.

Sankey Road would be used to transport personnel, equipment, and other construction materials to the PGCC west levee during project construction, which would result in a temporary increase

in traffic, as discussed under Impacts 4.12-a, "Temporary Increase in Traffic on Local Roadways," in the Phase 3 DEIS/DEIR. Mitigation Measure 4.12-a, "Prepare and Implement a Traffic Safety and Control Plan for Construction-Related Truck Trips," in the Phase 3 DEIS/DEIR would reduce this impact; however, the impact would remain significant and unavoidable because of the high amount of hauling required for the Phase 3 Project and the limited number of roadways in the project vicinity that would be suitable for hauling between borrow sites and project construction sites.

See also Response to Comment PH-8.

PH-8 The Phase 3 Project includes improvements to the PGCC west levee; no improvements are proposed for the PGCC east levee.

As noted in Section 2.3.1.1, "Levee Raises, Widening, and Slope Flattening," in the Phase 3 DEIS/DEIR, the levee segment of the PGCC at Sankey Road that lacks adequate levee height would be maintained at its current elevation, under the Phase 3 Project, because the flows through this levee segment into the interior of the Natomas Basin during a FEMA 100-year or "200-year" design event would not damage the levee and are subject to management as part of Natomas Basin's interior drainage system.

PH-9 It is not clear what is meant by the comment's reference to floodplain plantings. The floodplain is protected by the Natomas Basin perimeter levee system. Woodland plantings would occur in this protected floodplain, on the landside of the Sacramento River east levee. These plantings would have no effect on flood stage flows, which occur in the designated floodway on the waterside of the Sacramento River east levee. Section 2.3.3.6, "Long-Term Management of Habitat Components," in the Phase 3 DEIS/DEIR addresses the long-term management of habitat areas, such as woodland plantings. Funding mechanisms for Phase 3 Project habitat improvements would be addressed in SAFCA's Programmatic Long-Term Management Plan.

PH-10 The only proposed revegetation of the PGCC would be with native perennial grasses. No trees or elderberry shrubs would be planted on the banks of the PGCC. The native grasses would replace ruderal and annual nonnative grass habitat that currently provides foraging habitat for raptors and terrestrial habitat for the aquatic giant garter snake. See also Response to Comment PH-9.

PH-11 Comment noted; SAFCA acknowledges the commenter's history of flooding at his property.

PH-12 Comment noted. Vegetation removal is discussed under Impact 4.8-a, "Loss of Woodland Habitats," in the Phase 3 DEIS/DEIR.

PH-13 USACE does not allow pipes that convey water into the Natomas Basin to penetrate the levees below the design water surface profile. Such low-level penetrations create vulnerabilities in the levees. Pipes can only be installed in the levees. Therefore, because the Phase 3 Project includes raising the levees, the pipes also need to be raised above the design water surface profile.

The Phase 3 Project would not change the water surface elevations in the channel with the raised levee. Further, the Phase 3 Project would not alter the existing water surface elevation and would not increase the commenter's existing exposure to flood damage.

Plate 3, "Levee Segments Requiring Seepage Remediation and Levee Height Increases," in the Phase 3 DEIS/DEIR illustrates the locations and amounts of levee height deficiency that would be addressed by the Phase 3 Project.

PH-14 See Response to Comment PH-13 regarding raising of pumping facilities. Hydraulic impacts of the Phase 3 Project are addressed in Impact 4.4-a, "Hydraulic Impacts on Other Areas and Exposure to Flood Risk." Additional information regarding hydraulic impacts to Garden Highway residents was provided in the Phase 2 FEIR under Master Response 1, "Hydraulic Impacts of the NLIP" (SAFCA 2007b).

PH-15 See Response to Comment I7-2. SAFCA is currently discussing issues with the commenter specific to his property.

PH-16 See Response to Comment I7-2.

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4.0 REVISIONS TO THE DEIS/DEIR

Changes to the text of the Phase 3 DEIS/DEIR are shown in this chapter, in page order, with a line through the text that has been deleted (~~strikeout~~) or underlining where new text has been added.

4.1 REVISIONS TO CHAPTER 1.0, "INTRODUCTION AND STATEMENT OF PURPOSE AND NEED"

PAGE 1-13

In response to Comments O2-5, O2-6, O2-7, O5-8, and I2-4, the paragraph entitled, "Encroachment" in Section 1.4.2.1, "Flood Problems and Needs," on page 1-13 of the Phase 3 DEIS/DEIR is revised as follows:

> USACE levee guidance requires the removal of vegetation greater than 2 inches in diameter on the levee slopes and within 15 feet of the waterside and landside levee toes. This guidance also may require removal of encroachments on the levee slopes, including utilities, fences, structures, retaining walls, driveways, and other features that penetrate the levee prism or affect operation and maintenance of the levee system. Substantial encroachments are present on the Sacramento River east levee. **Plates 6a** and **6b** illustrate typical encroachments in the area. Should any of these existing encroachments be determined to threaten the integrity of the levee or otherwise increase flood risk unacceptably, the encroachments would need to be removed. RD 1000 is the entity initially responsible for removing encroachments that have been identified as threatening levee integrity. Any such encroachment removal would be subject to future, separate environmental review.

4.2 REVISIONS TO CHAPTER 2.0, "ALTERNATIVES"

PAGE 2-21

To provide clarification regarding the proposed habitat conservation components for Swainson's hawk foraging habitat on agricultural lands, Section 2.3.3.3, "Rice and Field Crop Preservation," of the Phase 3 DEIS/DEIR is revised as follows:

> A significant portion of the borrow material needed to construct the Phase 3 Project would be obtained from existing rice or field crop lands. Following removal, stockpiling, and respreading of the topsoil, these lands would be graded, returned to rice or field crop cultivation, and managed to enhance the habitat values associated with these agricultural activities. It is estimated that rice production would be lost for one year, and field crop production would be lost for two years.
>
> To partially mitigate impacts to suitable Swainson's hawk foraging habitat, SAFCA would create, enhance, and preserve (where feasible) agricultural lands, preferably on sites (as identified in Section 2.3.8.3) used to obtain borrow material where feasible. Particular types of foraging habitat, particularly alfalfa and hay crops, provide higher value foraging habitat for Swainson's hawks than other habitat types (Estep 1989, Estep 2008, Woodbridge 1998). The characteristics that contribute to the high value of this habitat include:
>
> - low vegetation structure, which increases prey accessibility;
> - relatively large prey populations due to abundant cover and food;
> - farming operations, such as weekly irrigation, which increases cover and food for prey; and
> - regular mowing, which lowers vegetation structure, disturbs prey, and increases accessibility.

SAFCA would acquire and preserve agricultural land (preferably lands also used to obtain borrow material) and manage it specifically to provide habitat types (e.g., agricultural and/or other vegetation types) that would provide high-quality foraging habitat for Swainson's hawk throughout the nesting season. Other factors that contribute to the value of the Swainson's hawk foraging habitat being preserved include:

- its proximity to other preserved habitat (i.e., larger contiguous parcels of suitable foraging habitat generally provide greater foraging value than smaller parcels), and
- managing foraging habitat for Swainson's hawk over the long term or in perpetuity.

Giant garter snakes have adapted successfully to typical rice agricultural practices because rice fields provide sufficient water, cover, and food during the snake's active season. Therefore, the success criterion for the Brookfield rice mitigation site is the continued production of rice using the methodologies developed for the NBHCP. In the first year, t~~T~~his site would be monitored qualitatively once per month between May 1 and September 30~~, and through the annual review of water supply and harvest records.~~ to demonstrate successful site restoration to rice production. Subsequently, the site would be managed according to NBHCP guidelines to ensure that rice production continues appropriately in perpetuity.

PAGE 2-21

As a clarification regarding consultation with agencies for woodland habitat performance criteria, the first paragraph on page 2-21 of the Phase 3 DEIS/DEIR (Section 2.3.3.5, "Woodlands") is revised as follows:

A monitoring plan with performance criteria would be developed to determine the progress of the woodland habitats towards providing adequate mitigation. The criteria for measuring performance would be used to determine if the conservation component is trending toward sustainability (reduced human intervention) and to assess the need for adaptive management (e.g., changes in design or maintenance revisions). These criteria must be met for the conservation component to be declared successful, both during a particular monitoring year and at the end of the establishment period. These performance criteria, which would be developed in consultation with USFWS, National Marine Fisheries Service (NMFS), and DFG, would include, but are not limited to:

PAGE 2-27

In response to Comments O4-5 and 04-17, the second paragraph in Section 2.3.74, "Natomas East Main Drainage Canal West Levee," on page 2-27 of the Phase 3 DEIS/DEIR is revised as follows:

Construction is anticipated to require three headings working in back-to-back 12-hour shifts per day with 24-hours-per-day operation required to complete the cutoff wall before the flood season. A 6-day work (Monday through Saturday) week is expected (with maintenance on Sunday), with a total of 75 working days to complete cutoff wall installation. Sections of East Levee Road, including the intersection with Sorento Road, would be closed for approximately three months during construction. Alternative neighborhood access would be provided for residents north of the NEMDC Stormwater Pumping Station whose driveways connect to East Levee Road. Except for its intersection with East Levee Road, Sorento Road would remain open during construction. If the cutoff wall is constructed with a CB mix, up to 167,000 cy of excess soil from the excavation of the trench would be used to construct the levee improvement between Elkhorn Boulevard and the NEMDC Stormwater Pumping Station. North of the NEMDC Stormwater Pumping Station to Elkhorn Boulevard, levee widening and maintenance area acquisition would

occur similar to what is described for the PGCC west levee. **Appendix H**, Section 3 provides details of the general construction plan and the construction sequence.

PAGE 2-28

In response to Comment Letter S5 and to provide clarification and additional detail, the third paragraph under Section 2.3.7.6, "Reclamation District 1000 Pumping Plant No. 2," on page 2-28 of the Phase 3 DEIS/DEIR is revised as follows:

> The replacement outfall structure would be constructed close to the location of the original Pumping Plant No. 2 outfall structure. The concrete outfall structure would have a footprint of approximately 21 by 21 feet. A sheet pile cofferdam would be used to isolate and dewater an area of approximately 23 by 23 feet for instream construction. Construction of the cofferdam and dewatering would occur during an in-water work window when sensitive fish species are least likely to be present (e.g., July 1–October 31). Further, sheet pile installation operational controls and a fish rescue plan would be developed and implemented during cofferdam construction and dewatering activities to avoid and/or minimize the potential for disturbance and/or fish stranding. Upon completion of construction, the sheetpile wall would be cutoff at the sediment-water interface. The embedded portion of the sheetpile wall would be left in place for erosion protection. Riprap stone protection would be placed on the water side of the outfall structure extending down the bank ~~to the streambed and~~ approximately 20 feet into the river channel without dewatering. The existing outfall structure, discharge piping, and some abandoned pilings in the river would be removed.

PAGE 2-29

In response to Comment Letter S5 and to provide clarification and additional detail, Section 2.3.7.7, "Prichard and Elkhorn Pumping Plant Modifications," on page 2-29 of the Phase 3 DEIS/DEIR is revised:

> Because the Basin is surrounded by levees, NCMWC water is pumped into the Basin using NCMWC facilities and returned to the river via RD 1000's drainage system and pumping plants. Because the discharge pipes are required to cross the levee above the new "200-year" design flood elevation, the existing pump house and gate structure for the NCMWC Elkhorn Pumping Plant would need to be removed. The existing manifold structure and the gate structure for the NCMWC Prichard Pumping Plant would also need to be removed. The existing pumps at both pumping plants might require modification or replacement to continue existing design performance after the levee improvements and pipe raising.
>
> As discussed in Chapter 5.0, "Cumulative and Growth-Inducing Impacts, and Other Statutory Requirements," the demolition of the Prichard and Elkhorn Pumping Plants and the removal of the intake pipes are part of the American Basin Fish Screen and Habitat Improvement Project (ABFS), which would include a replacement pumping facility on the Sacramento River near the intersection of Garden Highway and Sankey Road. As a result, the construction activities to be included in the Phase 3 Project associated with the pumping plants could vary depending on the timing of the ABFS project in relation to Phase 3 Project activities. Detail regarding ~~the~~ potential timing scenarios, anticipated construction equipment and duration, and hauling requirements for Prichard and Elkhorn Pumping Plant modifications are contained in **Appendix H**, Section 7.

4.3 REVISIONS TO CHAPTER 3.0, "AFFECTED ENVIRONMENT"

PAGE 3-7

In response to Comment O4-9, the second paragraph in Section 3.3.2.1, "Land Uses in the Project Area," on page 3-7 of the Phase 3 DEIS/DEIR is revised as follows:

> Within the Phase 3 Project area, land uses located adjacent to the PGCC west levee and the Sacramento River east levee are primarily agricultural. On the lower NEMDC, the west levee forms the eastern boundary of the communities of North and South Natomas with residences and businesses located immediately adjacent to the west levee, including the Valley View Acres community. Along the Sacramento River east levee, there are approximately 40 residences, a public boat launch facility and 2 private marinas located on the water side of the levee and approximately 7 rural residences located on the land side of the levee in Reaches 5A–9B. The two private marinas and public boat launch facility operated by the Sacramento County Regional Parks Department are located in Reach 9B, close to one another near the I-5 Bridge. Facilities at the marinas consist of parking, shaded picnic areas, boat docks and boat slips, restaurants and bars/taverns, and restrooms. Facilities at the Sacramento County Elkhorn Boat Launch Facility consist of parking, boat ramp, shaded picnic facilities, and restrooms. Within the Elkhorn Borrow Area there are approximately 6 farm residences with associated farm structures and equipment storage yards.

PAGE 3-10

As a clarification and in response to Comment O4-10, Section 3.3.2.2, "Relevant Land Use Plans and Policies," under "City of Sacramento General Plan" on page 3-10 of the Phase 3 DEIS/DEIR is revised as follows:

> At the time of this writing, the *City of Sacramento General Plan 2030 Update* is in the review process (public review period for the draft general plan ended July 31, 2008). The *City of Sacramento General Plan 2006* contains goals and policies related to flood damage reduction and the phased conversion of agricultural properties, as well as the provision of sufficient housing and commercial and economic opportunities (City of Sacramento 1988). The City has a program with SAFCA and USACE in which it works with SAFCA and other responsible agencies to resolve floodplain restrictions. The following policies from the *City of Sacramento General Plan 2006* may be relevant to this project.

PAGE 3-54

In response to Comments O3-1 and O4-11, Table 3.12-1 on page 3-54 of the Phase 3 DEIS/DEIR is revised as follows:

Table 3.12-1
Project Area Roadway Network

Roadways	Description
SR 99/70	SR 99/70 is a primary regional transportation corridor within Sutter County and supports north-south regional travel. SR 99 extends from I-5 in the project area north through Sacramento and Sutter Counties to the Butte County line. The roadway has two to four lanes over its length and provides regional access to the Sacramento metropolitan area in the south and the cities of Gridley and Chico in the north. SR 70 serves as the north-south regional travel corridor providing connection to Butte County to the north and Sacramento County to the south. SR 70 is a two-lane roadway that extends from the Yuba County line in the north, south to a junction with SR 99. At the junction with SR 99, SR 70 continues south as SR 99/70 to the Sacramento County line. The roadway provides regional access to the cities of Sacramento and Marysville.

Table 3.12-1 Project Area Roadway Network	
Roadways	**Description**
I-5	I-5 is a primary regional transportation corridor within Sacramento County, providing connection between the city and county of Sacramento and Yolo County. It provides primary access to the Airport just west of Powerline Road.
I-80	I-80 is a primary regional transportation corridor within the city and county of Sacramento, intersecting I-5 just south of San Juan Road.
Garden Highway	Garden Highway is a north/south two-lane roadway that extends north from the Sacramento city limits along the Sacramento River to Yuba City. Garden Highway serves as an alternative north/south route to SR 99. It provides primary access for residences along the water side of the Sacramento River east levee. Cyclists also use this roadway for commuting to and from work/school.
Howsley Road	Howsley Road is an east/west two-lane roadway that intersects SR 99/70 at the NCC. It crosses the PGCC and connects with Pleasant Grove Road just west of the Sutter/Placer County line.
Natomas Road	Natomas Road is a north/south two-lane roadway on top of the west levee of the PGCC in Sutter County. It extends south from Howsley Road and becomes East Levee Road between Riego Road and West Elverta Road.
Pacific Avenue	Pacific Avenue is a north/south two-lane roadway that extends from Striplin Road to Howsley Road in Sutter County.
Powerline Road	Powerline Road is a north/south two-lane roadway that parallels SR 99/70, providing an alternate north/south route to Garden Highway and SR 99/70 from Sankey Road in Sutter County to Garden Highway in Sacramento County.
Riego Road	Riego Road is an east/west two-lane roadway extending from Garden Highway in Sutter County to Base Line Road in Placer County.
Sankey Road	Sankey Road is an east/west two-lane roadway in Sutter County that extends from Garden Highway east across SR 99/70.
Striplin Road	Striplin Road is an east/west two-lane roadway that extends from Garwood Road to Pacific Avenue in Sutter County.
West Elverta Road	West Elverta Road is an east/west two-lane roadway in Sacramento County at the north/south midpoint of the Natomas Basin that extends from Garden Highway east across SR 99/70.
Elkhorn Boulevard	Elkhorn Boulevard is an east/west two-lane roadway in Sacramento County between Powerline Road and SR 99/70 and extending into the city of Sacramento to the East Levee Road on the NEMDC.
West Elkhorn Boulevard	West Elkhorn Boulevard is an east/west two-lane roadway in Sacramento County that extends from Garden Highway to west of the Airport.
East Levee Road	East Levee Road is a two-lane, north-south road on the NEMDC west levee that extends from Natomas Road, in the vicinity of Riego Road, south to Sotnip Road.
Sorento Road	Within the project area, Sorento Road is a two-lane north-south road between East Levee Road on the north and Del Paso Road on the south.
Del Paso Road	Del Paso Road is an east/west two- to four-lane roadway that extends eastward across the Basin from Powerline Road in Sacramento County across I-5 to the NEMDC in the city of Sacramento, where it continues eastward as Main Avenue. Del Paso Road provides access to the Ueda Parkway Bike Trail, which is used by cyclists for commuting to and from work/school.
San Juan Road	San Juan Road is an east/west two-lane roadway that connects the Garden Highway in Sacramento County to I-5 and the city of Sacramento.
El Centro Road	El Centro Road is a north/south two- to four-lane roadway in Sacramento County and the city of Sacramento that extends south from Del Paso Road to West El Camino Avenue.
West El Camino Avenue	West El Camino Avenue is an east/west four-lane roadway in the city of Sacramento that connects I-5 with El Centro Road. Continuing to the east, it intersects with Northgate Boulevard and continues to the east to cross the NEMDC.
Northgate Boulevard	Northgate Boulevard is a north/south four-lane road in the city of Sacramento connecting SR 160 in the south to Del Paso Road in North Natomas.
Notes: I-5 = Interstate 5; I-80 = Interstate 80; NCC = Natomas Cross Canal; NEMDC = Natomas East Main Drainage Canal; PGCC = Pleasant Grove Creek Canal; SR = State Route Source: Data compiled by EDAW in 2008 and 2009	

PAGE 3-62

In response to Comment O3-2, the second paragraph in Section 3.3.15, "Recreation," on page 3-62 of the Phase 3 DEIS/DEIR is revised as follows:

> The Ueda Parkway is located on the NEMDC west levee, in the Phase 3 Project area extending north from the vicinity of the Arden Garden Connector to Elkhorn Boulevard. The parkway integrates recreational trails within creek corridors in the northern area of Sacramento, including providing connections to the American River Parkway and the Dry Creek Parkway to the east of the NEMDC. The Ueda Parkway allows access to the natural habitat areas of Steelhead (NEMDC), Arcade, Dry, and Robla Creeks. A paved bike path exists on the levee crown of the NEMDC from Garden Highway to Sotnip Road, just north of Main Avenue. Gardenland Park, a 6-acre neighborhood park, is located off of Bowman Avenue immediately adjacent to the NEMDC west levee and Ueda Parkway in South Natomas. An on and off-street bicycle trail is located adjacent to Garden Highway on the American River north levee and Sacramento River east levee, between Northgate Boulevard and Gateway Oaks Drive in South Natomas. Recreational bicycle use occurs along the entire length of Garden Highway, which is also used by bicycle commuters.

4.4 REVISIONS TO CHAPTER 4.0, "ENVIRONMENTAL CONSEQUENCES AND MITIGATION MEASURES"

REVISIONS TO SECTION 4.1, "AGRICULTURAL RESOURCES"

PAGE 4.1-2

In response to Comment O4-12 and to correct an inaccuracy, Table 4.1-1 on page 4.1-2 of the Phase 3 DEIR/EIS is revised as follows:

Table 4.1-1
Conversion of Important Farmland: Comparison of Proposed Action and Raise-in-Place Alternative

Project Component/Location	No-Action Alternative	Proposed Action (Acres)	Levee Raise-in-Place Alternative (Acres)
Permanent Conversion			
Sacramento River east levee	-	86	56
Canal relocations	-	60	60
PGCC west levee	-	60	60
NEMDC west levee		13	13
Woodland plantings (includes Lower Woodlands)	-	35.5	157
RD 1001 Borrow Site	-	120	120
Total	-	~~361.5~~374.5	~~453~~466
Temporary Conversion			
Brookfield Borrow Site	-	180	180
Dunmore Borrow Site	-	160	160
Novak Borrow Site	-	76	76
Pacific Terrace Borrow Site	-	113	113
Private Property Reach 5A Borrow Site	-	34	34

Table 4.1-1
Conversion of Important Farmland: Comparison of Proposed Action and Raise-in-Place Alternative

Project Component/Location	No-Action Alternative	Proposed Action (Acres)	Levee Raise-in-Place Alternative (Acres)
Private Property Reach 6B Borrow Site	-	20	20
Private Property Reach 7 Borrow Site	-	67	67
South Sutter, LLC Borrow Site	-	95	95
Sutter Pointe Borrow Site	-	300	300
Elkhorn Borrow Area[1]	-	612	612
Total[2]	**-**	**1,657**	**1,657**

[1] Area of potential conversion because specific parcels have not yet been identified within the Elkhorn Borrow Area.
[2] Potential maximum if all borrow sites, including the larger Elkhorn Borrow Area footprint, are excavated over entire acreage available.
Source: Data compiled by EDAW in 2008 and 2009

PAGES 4.1-3 AND 4.1-4

In response to Comment O4-12, Impact 4.1-a, "Conversion of Important Farmland to Nonagricultural Uses," under "Proposed Action" and "Levee Raise-in-Place Alternative" on pages 4.1-3 and 4.1-4 of the Phase 3 DEIS/DEIR is revised as follows:

Proposed Action

Important Farmland mapping for the Natomas Basin is shown on Plate 19 and Important Farmland classifications are described in detail in Chapter 3.0, "Affected Environment," in Section 3.3.1, "Agricultural Resources."

Nearly all of the areas within the footprint of flood damage reduction facilities (except for the area of the NEMDC south of the stormwater pumping station) are classified as Prime Farmland, Farmland of Statewide Importance, or Farmland of Local Importance. For the Proposed Action, a total of approximately ~~361.5~~ 374.5 acres of Important Farmland would be permanently converted to nonagricultural use within the footprint of flood damage reduction facilities and on adjacent land required for maintenance access and prevention of encroachment into the flood damage reduction system. These lands include approximately 60 acres in the footprint of the relocated Elkhorn Canal and the new Giant Garter Snake (GGS)/Drainage Canal, 60 acres in the footprint of the levee improvements along the PGCC, 13 acres along the NEMDC and 86 acres in the footprint of the Sacramento River levee improvements. A total of 35.5 acres of Important Farmland would be converted for woodland plantings to compensate for loss of woodlands primarily on the land side of the levee. The conversion of these areas to nonagricultural uses would be permanent, and therefore is considered a **significant** impact.

Levee Raise-in-Place Alternative

The raised portion of the Sacramento River east levee under the Levee Raise-in-Place Alternative would have a smaller footprint than the adjacent setback levee in Reaches 5–9B under the Proposed Action, and therefore, would have slightly less impact on Important Farmlands than would the Proposed Action. Approximately 56 acres of Important Farmland would be permanently converted in the footprint of the Sacramento River east levee flood damage reduction facilities footprint under this alternative, compared with 86 acres under the Proposed

Action. This alternative would include the same conversion of Important Farmland as the Proposed Action in the footprint of the relocated Elkhorn Canal and the new GGS/Drainage Canal (approximately 60 acres), ~~and~~ the PGCC (approximately 60 acres), and the NEMDC (approximately 13 acres). Because greater impacts to waterside riparian woodlands would require a higher replacement ratio than for landside woodlands, approximately 157 acres of Important Farmland could be converted for habitat creation. The 24-acre Lower Woodlands site would be part of this conversion; the location of the remaining planting sites has not been determined (see Impact 4.8-a).

REVISIONS TO SECTION 4.2, "LAND USE, SOCIOECONOMICS, AND POPULATION AND HOUSING"

PAGES 4.2-4 AND 4.2-5

In response to Comment O2-27, the second paragraph under "Proposed Action" on pages 4.2-4 and 4.2-5 of the Phase 3 DEIS/DEIR (Impact 4.2-c, "Potential to Physically Divide or Disrupt an Established Community") is revised as follows:

Impact 4.2-c: Potential to Physically Divide or Disrupt an Established Community

Proposed Action

With respect to the physical division or disruption of an established community, the Proposed Action would not divide or disrupt the communities located adjacent to the lower NEMDC because construction would be restricted to the adjacent setback levee area, and would not require full closure or demolition of Garden Highway. No established communities are present along the land side of the Sacramento River east levee or within the Elkhorn Borrow Area. Because the residences and businesses located along the water side of the Sacramento River east levee are widely spaced and are not near to a broader community on the land side of the levee, the project would not divide an established community. However, because Garden Highway provides the only access to residences and businesses on the water side of the levee, intermittent road closures and detours would be a disruption for residents and business operators (refer to Section 4.12, "Transportation and Circulation"). Additionally, construction of a cutoff wall would be required along the Sacramento River east levee adjacent to the I-5 Bridge. This would require closure of approximately 1,000 feet of the Garden Highway in this location (about 500 feet upstream and downstream of the I-5 Bridge) for approximately 8 to 12 weeks during the summer season, preventing landside access to the Sacramento County public boat launch facility. Access would be maintained to two nearby marinas, located to the north of the boat launch ramp; however, these businesses may experience a decrease in customers because of construction activities, and closure of the adjacent boat launch ramp. North Bayou Road would also remain open; however, it would have a detour with a gravel surface at this location during construction. Temporary disruptions to access for residents and businesses and construction related disruptions affecting businesses would be a **significant** impact.

PAGES 4.2-5 AND 4.2-6

To provide clarification and additional detail, Mitigation Measure 4.2-c, "Notify Residents and Businesses of Project Construction and Road Closure Schedule; and Implement Mitigation Measure 4.12-a, "Prepare and Implement a Traffic Safety and Control Plan for Construction-Related Truck Trips," and Mitigation Measure 4.12-c, "Notify Emergency Service Providers about Project Construction and Maintain Emergency Access or Coordinate Detours with Providers"," on pages 4.2-5 and 4.2-6 of the Phase 3 DEIS/DEIR is revised as follows:

Mitigation Measure 4.2-c: Notify Residents and Businesses of Project Construction and Road Closure Schedule; Comply with the Garden Highway Settlement Agreement; and Implement Mitigation Measure 4.12-a, "Prepare and Implement a Traffic Safety and Control Plan for Construction-Related Truck Trips," and Mitigation Measure 4.12-c, "Notify Emergency Service Providers about Project Construction and Maintain Emergency Access or Coordinate Detours with Providers"

Proposed Action

SAFCA and its primary contractors for engineering design and construction shall implement Mitigation Measures 4.12-a, "Prepare and Implement a Traffic Safety and Control Plan for Construction-Related Truck Trips," and 4.12-c, "Notify Emergency Service Providers about Project Construction and Maintain Emergency Access or Coordinate Detours with Providers," contained in Section 4.12, "Transportation and Circulation." Additionally, the following measures shall be implemented:

a) SAFCA shall provide residents and business owners located adjacent to the construction areas with information regarding construction activities including contact information and complaint procedures, and a construction ~~timeline and shall post its construction~~ schedule to be posted on the SAFCA Web site. Information shall include road closures and detour information. The schedule shall be updated on a monthly basis.

b) SAFCA shall comply with the provisions of the Garden Highway Settlement Agreement including provisions regarding complaint procedures, power pole plans, encroachment removal plans, and construction schedule.

c) SAFCA shall provide notice as feasible for emergency construction or remedial construction.

Implementation of these mitigation measures would reduce the level of impact, but not to a less-than-significant level. Because no other feasible mitigation measures are available to fully reduce this impact to a less-than-significant level, this impact would remain **significant and unavoidable** under the Proposed Action.

Levee Raise-in-Place Alternative

SAFCA and its primary contractors for engineering design and construction shall implement Mitigation Measures 4.12-a, "Prepare and Implement a Traffic Safety and Control Plan for Construction-Related Truck Trips," and 4.12-c, "Notify Emergency Service Providers about Project Construction and Maintain Emergency Access or Coordinate Detours with Providers," contained in Section 4.12, "Transportation and Circulation."

In addition to measures (a), (b), and (c), listed under the Proposed Action, above, the following measures shall be implemented:

~~c)~~d) SAFCA shall provide assistance for residents who are required to relocate during the construction period. SAFCA shall compensate residents for reasonable rent and living expenses incurred due to relocation. Residents will have the right to decent, safe and sanitary housing in accordance with the Uniform Relocation Assistance and Real Property Acquisition Act.

~~d)~~ e) SAFCA shall provide 24-hour security patrols for residences and businesses that must be vacated during the construction period.

~~e)~~ f) SAFCA shall negotiate an agreement, consistent with the terms of existing leases, with any business required to suspend operations during levee/cutoff wall construction in order to reimburse them for loss of revenue during the time that they will be closed, based on actual income for that time of year.

Implementation of these mitigation measures would reduce the level of impact, but not to a less-than-significant level due to the potential for temporary dislocation of residents and business closures as a result of road closures of approximately 8 to 12 weeks. Therefore, this impact would remain **significant and unavoidable** under the Levee Raise-in-Place Alternative because no other feasible mitigation measures are available. ***(Greater)***

REVISIONS TO SECTION 4.4, "HYDROLOGY AND HYDRAULICS"

PAGE 4.4-14 THROUGH 4.4-15

In response to comments regarding groundwater hydrology in the vicinity of the NEMDC, Impact 4.4-c, "Effects on Groundwater," in the Phase 3 DEIS/DEIR is revised as follows and a new mitigation measures is added:

Impact 4.4-c: Effects on Groundwater

Proposed Action and Levee Raise-in-Place Alternative

Construction of the adjacent setback levee in Reaches 5A–9B under the Phase 3 Project includes installation of conventional soil-bentonite cutoff walls from Station 228+70 to Station 262+50 (Reach 5A) and from Station 338+00 to Station 455+00 (Reaches 7–9B), and installation of deep soil mix cutoff walls from Station 293+50 to Station 338+00 (Reaches 6A–7) and from Station 455+00 to Station 468+00 (Reach 9B) of the proposed adjacent levee. The Phase 3 Project would also include installation of cutoff walls in the west levee of the PGCC where required and in the west levee of the NEMDC between Elkhorn Boulevard and Northgate Boulevard. The depth of these cutoff walls from the levee crown would range from 60 to 80 feet.

The presence of cutoff walls could restrict the movement of groundwater in either direction (away from or toward the Sacramento River, the PGCC, or the NEMDC), potentially increasing or decreasing localized near-surface groundwater levels in areas immediately east and west of the cutoff wall. A significant drop in groundwater levels could decrease the yields of nearby wells or increase the pumping costs of those wells. The combined effect of all of SAFCA's proposed construction activities under the NLIP (including the contribution of the Phase 3 Project) on the overall groundwater budget for the Natomas Basin under both existing and future conditions is discussed in Chapter 5.0, "Cumulative and Growth-Inducing Impacts, and Other Statutory Requirements."

The evaluation of potential groundwater impacts prepared by Luhdorff & Scalmanini Consulting Engineers (LSCE) (**Appendix B2**) estimated the water-level changes caused by the cutoff walls along the Sacramento River east levee. These estimates were based on simulations using the SEEP/W groundwater model analysis developed by Kleinfelder in its report, *Evaluation of Cutoff Walls Impact on Groundwater Recharge Sacramento River East Levee* (**Appendix B3**). On the

water side of the levee, the predicted effect of the cutoff wall is negligible (less than an inch) at low stage, and there would be a slight increase in groundwater levels (less than 1 foot) at high stage (see Figure 8-2 in **Appendix B2**). On the land side of the levee, the simulated groundwater levels are slightly lower because of the cutoff wall (typically 0.25 to 0.5 foot). In both cases, impacts, if any, would be small enough to be considered negligible even for the shallowest domestic wells (less than 100 feet deep). As a result, no substantial decrease in groundwater levels or well yields or increase in pumping costs is expected to be caused by the cutoff walls along the Sacramento River east levee; therefore, this impact is considered **less than significant**.

Similar modeling has not been conducted for wells along the PGCC or NEMDC, but cutoff walls would be expected to have similarly small effects near the eastern edge of the Natomas Basin. Because the general direction of groundwater flow in this area is from west to east, static groundwater levels would increase slightly west of the levee and decrease slightly east of the levee. This effect would not reduce the ability of most wells to draw groundwater because the production zone for these wells is below the bottom of the proposed cutoff walls. Very shallow wells located near the cutoff wall on either side of the levee could experience slightly lower pumping water levels because the cutoff wall would act as a low permeability boundary that would reduce the aerial extent and increase the depth of the localized cone of depression. This effect would not be measurable for most wells, but wells less than 80 feet deep located within 500 feet of the NEMDC west levee could experience a small decrease in yield. This impact is considered **less than significant**; however, Mitigation Measure 4.4-c has been added below to ensure that the owners of any affected well are adequately compensated for replacing their shallow well with a deeper one, if necessary.

The evaluation of potential groundwater impacts prepared by LSCE also investigated the effects on groundwater of excavation of the proposed borrow sites (see **Appendix B2**). Excavation and reclamation of the Brookfield borrow site would have an indirect effect on groundwater conditions because of the proposed delivery of surface water to the site. Approximately 325 acres are planted with rice. SAFCA plans to restore any portion of the site that is used for borrow operations to rice cultivation after construction activities are complete. The Brookfield site is currently irrigated entirely with groundwater, but SAFCA has proposed to provide the infrastructure necessary to irrigate up to 80% of the site with surface water after reclamation. This transition would reduce groundwater pumping by about 1,625 afy. Groundwater levels would increase because of the reduced pumping, which is expected to increase subsurface outflow beneath the PGCC by about 76 afy. Groundwater would not decrease as a result of using Brookfield as a borrow site, and groundwater levels there would increase slightly. This impact is considered **less-than-significant** (but beneficial from the aspect of the overall increase to groundwater levels). ***(Similar)***

~~**Mitigation Measure: No mitigation is required.**~~

Mitigation Measure 4.4-c: Monitor Landside Production Wells along the NEMDC for Effects on Yield, and Remediate Effects if Necessary

Proposed Action and Levee Raise-in-Place Alternative	SAFCA shall implement a program to monitor groundwater elevations within 500 feet of the NEMDC west levee to determine what effects, if any, occur on the yield of shallow domestic wells following installation of cutoff walls in this area of the NLIP. In the event that the yield of any of these wells is measurably reduced, SAFCA shall arrange with the owners of affected wells to retrofit or replace these wells to provide pre-construction yields.

Implementation of this mitigation measure would further reduce this less-than-significant impact. ***(Similar)***

REVISIONS TO SECTION 4.5, "WATER QUALITY"

PAGE 4.5-4

To correct a reference, the first paragraph on page 4.5-4 of the Phase 3 DEIS/DEIR (Mitigation Measure 4.5, "Implement Standard Best Management Practices, Prepare and Implement a Stormwater Pollution Prevention Plan, and Comply with National Pollutant Discharge Elimination System Permit Conditions") is revised as follows:

> Several technical studies have been conducted regarding water-quality control feature impacts on groundwater (e.g., City of Fresno Nationwide Urban Runoff Project and *California Storm Water Best Management Practices Handbook* prepared by the Stormwater Quality Task Force) and surface water (e.g., *Cumulative Water Quality Analysis Report for the Lahontan Development 1996–2002* [~~Huffman & Carpenter 2003~~ Lahontan Regional Water Quality Control Board 2007]). These studies have determined that water-quality control features such as revegetation, erosion control measures, and detention and infiltration basins have been successful in avoiding water quality impacts (metals and organic compounds associated with stormwater are typically lost within the first few feet of the soil of the retention basins associated with groundwater). Technical studies associated with the Lahontan Development (residential and golf course development) demonstrated that the use of a variety of BMPs (e.g., source control, detention basins, revegetation, and erosion control) have been able to maintain surface water quality conditions in adjacent receiving waters (Martis Creek).

REVISIONS TO SECTION 4.6, "FISHERIES"

PAGES 4.6-1 THROUGH 4.6-3

In response to Comment Letter S5 and to provide clarification and additional detail, Impact 4.6-a, "Loss of Fish or Aquatic Habitat through Increased Sedimentation and Turbidity or Releases of Contaminants," and Mitigation Measure 4.6-a, "Implement Mitigation Measure 4.5-a, Implement Standard Best Management Practices, Prepare and Implement a Stormwater Pollution Prevention Plan, and Comply with National Pollutant Discharge Elimination System Permit Conditions"; and Mitigation Measure 4.5-c, "Implement Best Management Practices and Comply with NPDES Permit Conditions for a Point-Source Discharge"," on pages 4.6-1 through 4.6-3 of the Phase 3 DEIS/DEIR is revised as follows:

> **Impact 4.6-a: Loss of Fish or Aquatic Habitat through Increased Sedimentation and Turbidity, ~~or~~ Releases of Contaminants, or Other Construction-Related Disturbance**
>
> **Proposed Action and Levee Raise-in-Place Alternative**
>
> Project construction activities that could result in loss of fish or aquatic habitat through increased sedimentation and turbidity, or releases of contaminants, or other construction-related disturbance would include the following:
>
> - clearing and grubbing/stripping, degrading, and subsequent reconstruction of portions of the upper half of the PGCC west levee and NEMDC west levee;
> - construction of cutoff walls along the entire PGCC west levee and NEMDC west levee;

- extensive soil borrow excavation and placement for all levee improvements;

- construction of the adjacent setback levee along a portion of the Sacramento River east levee, finish grading,~~and~~ relocation and reconstruction of canals, and making modifications to the Prichard and Elkhorn Pump Plants; ~~and~~

- reconstruction of RD 1000 Pumping Plant No. 2, including construction of a cofferdam and dewatering, and demobilization/cleanup; and

- implementation of Mitigation Measure 4.6-b, "Restore, Replace, or Rehabilitate Degraded SRA Habitat Function and Comply with Section 7 of the Endangered Species Act, Section 1602 of the California Fish and Game Code, and Section 2081 of the California Endangered Species Act Permit Conditions."

These activities may temporarily impair water quality if disturbed and eroded soil is discharged and/or suspended into receiving waters. Soil and associated contaminants that enter receiving waters through stormwater runoff and erosion can increase turbidity, stimulate algae growth, increase sedimentation of aquatic habitat, and introduce compounds that are toxic to aquatic organisms. Impaired water quality would affect habitats and the physical health of individual fish and species populations within the Sacramento River, PGCC, and NEMDC. These waterways provide (or are hydrologically connected to waterways that provide) migratory habitat for special-status adult and juvenile chinook salmon and steelhead and spawning habitat for special-status green sturgeon, as well as striped bass and American shad.

Fish population levels and survival have been linked to levels of turbidity and siltation in a watershed. Prolonged exposure to high levels of suspended sediment could create a loss of visual capability in fish, leading to a reduction in feeding and growth rates; a thickening of the gill epithelia, potentially causing the decrease of respiratory function; clogging and abrasion of gill filaments; and increases in stress levels, reducing the tolerance of fish to disease and toxicants (Waters 1995).

Also, high levels of suspended sediments would cause the movement and redistribution of fish populations and could affect habitat. Once sediment is deposited, it could reduce water depths in pools, decreasing the water's carrying capacity for juvenile and adult fish (Waters 1995). Sediment resulting from construction may become embedded in the substrate (fish habitat), although natural flushing action is likely to clean the substrate within a few years after construction ceases. Increased sediment loading could adversely affect prey species downstream of the project area as well. Sediment loading could interfere with photosynthesis of aquatic flora and displace aquatic fauna. Many fish are sight feeders, and turbid waters reduce the ability of these fish to locate and feed on prey. Some fish, particularly juveniles, could become disoriented and leave areas where their main food sources are located, ultimately reducing their growth rates.

Avoidance is the most common result of increases in turbidity and sedimentation. Fish will not occupy areas unsuitable for survival unless they have no other option. Some fish, such as bass, will not spawn in excessively turbid water (Bell 1991). Therefore, project construction could cause fish habitat to become limited if high turbidity resulting from construction-related erosion were to preclude a species from occupying habitat required for successful completion of one or more life stages.

~~In addition, e~~Contaminants such as fuels, oils, and other petroleum products used in construction activities could be introduced into waters directly or through surface runoff. Contaminants may be toxic to fish or may alter oxygen diffusion rates and cause acute and/or chronic toxicity to aquatic organisms, thereby reducing growth and/or survival.

Installation of the sheetpile cofferdam and dewatering at the Pumping Plant No. 2 outfall reconstruction site could result in underwater sound pressure effects and fish stranding if fish are present in the immediate work area during construction activities. All in-water work would be conducted during periods when sensitive fish species are least likely to be present and a fish rescue plan would be implemented to minimize the potential for stranding of individual fish in the relatively small area within the cofferdam (23 feet by 23 feet). Available information indicates that exposure of fish species to underwater sound pressure levels exceeding approximately 180 decibels (dB) may result in sublethal (e.g., damage to ear, hearing impairments, behavioral implications including delays in migration) or lethal (e.g., ruptured swim bladder, internal bleeding) effects (Laughlin 2005). These critical sound levels exceed levels that are anticipated to be associated with project-related construction activities, as pile driving activities with repetitive high peaks have been documented to generate up to about 115 dB at a distance of 10 feet. Therefore, this activity is expected to be well below critical sound pressure levels for fish mortality or injury and avoidance of the construction area would be the anticipated behavioral response.

Under the Proposed Action and the Levee Raise-in-Place Alternative, there are two possible scenarios with respect to modifications at the Prichard and Elkhorn Pumping Plants dependent upon the timing of the American Basin Fish Screen and Habitat Improvement Project (ABFS) in relation to the timing of the Phase 3 Project (see **Appendix H** for additional detail regarding these scenarios). In addition to raising and replacing the discharge pipes to accommodate the levee improvements, the pumping plants could also require modification, including the replacement of pumps, dredging of localized areas below the pump impellers, and stabilizing of the supporting structure. Individual fish, if present in the immediate work area during construction activities, could be injured by equipment used for these activities. Behavioral avoidance of adverse habitat conditions by fish is anticipated to be the most common result of increases in disturbance. Fish and other aquatic organisms displaced from their habitat due to the application of riprap or localized dredging could become vulnerable to predators or other unfavorable habitat conditions. Any potential existing adverse impacts associated with operation of the pumping plants (e.g., entrainment of fish under existing conditions) would not change because the operation (e.g., frequency, magnitude, or duration of pumping plant operation) of the modified plants would not change.

While the implementation of in-water work windows and a fish rescue plan would reduce potential impacts, these activities lack the necessary detail to ensure that impacts would remain below thresholds of significance. For the reasons described above, construction-related disturbance and sedimentation and increased turbidity or other contamination could degrade water quality and adversely affect fish habitats and fish populations. This potential impact is considered **significant**. ***(Similar)***

Mitigation Measure 4.6-a: Implement Mitigation Measure 4.5-a, "Implement Standard Best Management Practices, Prepare and Implement a Stormwater Pollution Prevention Plan, and Comply with National Pollutant Discharge Elimination System Permit Conditions," and Mitigation Measure 4.5-c, "Implement Best Management Practices and Comply with NPDES Permit Conditions for a Point-Source Discharge"; Implement a Feasible Construction Work Window that Minimizes Impacts to Special-Status Fish Species for Any In-Water Activities; and Implement Operational Controls and a Fish Rescue Plan that Minimizes Impacts to Fish Associated with Cofferdam Construction and Dewatering

Proposed Action and Levee Raise-in-Place Alternativ

SAFCA shall implement the following measures to reduce impacts to a less than significant level. These measures shall be included in construction specifications along with any additional measures identified in necessary permits.

SAFCA shall implement Mitigation Measure 4.5-a, as described in Section 4.5, "Water Quality." This measure requires filing an Notice of Intent (NOI) with the Central Valley RWQCB; implementing standard erosion and siltation measures and best management practices (BMPs); preparing and implementing a storm water pollution prevention plan (SWPPP); and complying with the conditions of the National Pollutant Discharge Elimination System (NPDES) general stormwater permit for construction activity.

~~Additionally,~~ SAFCA shall implement Mitigation Measure 4.5-c, as described in Section 4.5, "Water Quality," which requires filing a report of waste discharge with the Central Valley RWQCB and complying with the NPDES permit conditions prior to operation of RD 1000's Pumping Plant No. 2.

SAFCA shall identify and implement feasible in-water construction work windows in consultation with NMFS, USWFS, and DFG. In-water work windows shall be timed to occur when sensitive fish species/life stages are not present or least susceptible to disturbance (e.g., July 1–October 31). This measure would reduce potential construction-related direct impacts to fish from potential dredging and/or construction of the cofferdam and dewatering, and/or the placement of rock riprap because all in-water work would occur during the period of time that sensitive fish (or life stages) would be least likely to be present in the construction area.

The cofferdam sheetpiles at the outfall structure construction site shall be installed using a vibratory hammer that minimizes underwater sound pressure levels to the greatest extent feasible to minimize effects to sensitive fish species. Hammers shall only be used during daytime hours and shall commence at low energy levels and slowly build to impact force. If it is determined that a higher-intensity percussion hammer would be required for installing the cofferdam, avoidance of potential adverse effects would be achieved by consulting with NMFS, USFWS, and DFG to determine the appropriate actions, which may include surveying the outfall site to determine fish presence prior to installation, and possibly modifying the work window accordingly.

To reduce the potential for fish stranding or minimize the potential for harm during cofferdam dewatering activities, SAFCA or its contractor shall implement a fish rescue plan. Prior to the closure of the cofferdam in the Sacramento River, seining by a qualified fisheries biologist (with a current DFG collection permit) would be conducted within the cofferdam using a small-mesh seine to direct and move fish out of the cofferdam area. Upon completion of seining, the entrance to the cofferdam will be blocked with a net to prevent fish from entering the cofferdam isolation area before the cofferdam is completed. Once the cofferdam is completed and the area within the cofferdam is closed and isolated, additional seining will be conducted within the cofferdam to remove any remaining fish. Once most

of the fish have been removed from the isolated area, portable pumps with intakes equipped with 1.75 mm mesh screen shall be used to dewater to a depth of 1.5-2 feet. A qualified biologist would implement further fish rescue operations using electrofishing and dip nets. All fish that are captured will be placed in clean 5-gallon buckets and/or coolers filled with Sacramento River water, transported downstream of the construction area, and released back into suitable habitat in the Sacramento River with minimal handling. After all fish have been removed using multiple seine passes, electrofishing, and dip nets (as necessary) portable pumps with screens (see above) will be used for final dewatering. NMFS, USFWS, and DFG shall be notified at least 48 hours prior to the fish rescue.

Implementing this mitigation measure would reduce the potential impacts of increased sedimentation and turbidity, release and exposure of contaminants, or other construction-related disturbance on fish to a **less-than-significant** level because the use of BMPs (e.g., source control, detention basins, revegetation, and erosion control), implementing an in-water work window, and operational controls and a fish rescue plan would maintain surface water quality conditions in adjacent receiving waters and minimize disturbance to fish and aquatic habitats. ***(Similar)***

PAGES 4.6-4 AND 4.6-5

In response to Comment Letter S5 and to provide additional clarification and detail, Mitigation Measure 4.6-b, "Restore, Replace, or Rehabilitate Degraded SRA Habitat Function and Comply with Section 7 of the Federal Endangered Species Act, Section 1602 of the California Fish and Game Code, and Section 2081 of the California Endangered Species Act Permit Conditions," on pages 4.6-4 and 4.6-5 of the Phase 3 DEIS/DEIR is revised as follows:

Mitigation Measure 4.6-b: Restore, Replace, or Rehabilitate Degraded SRA Habitat Function and Comply with Section 7 of the Federal Endangered Species Act, Section 1602 of the California Fish and Game Code, and Section 2081 of the California Endangered Species Act Permit Conditions

Proposed Action To restore, replace, or rehabilitate SRA habitat along the Sacramento River east levee at the location of the RD 1000 Pumping Plant No. 2 and in the footprint of the drainage outfall structures, SAFCA shall implement the measures described below.

- Sacramento River water side riparian woodland areas that provide SRA habitat functions shall be identified and the primary engineering and construction contractors shall ensure, through coordination with a qualified biologist retained by SAFCA, that construction is implemented in a manner that minimizes disturbance of such areas to the extent feasible. Temporary fencing shall be used during construction to prevent disturbance of trees and shrubs that are located adjacent to construction areas but can be avoided.

- Sacramento River water side riparian forest and scrub shall be restored using native species, including an assemblage of grasses, sedges, shrubs, and trees. At maturity, the riparian vegetation community would provide SRA functions. SAFCA shall develop a detailed woodland planting design and management protocols in coordination with USFWS, NMFS, and DFG. A monitoring plan with performance

criteria shall be developed to determine the progress of the woodland habitats towards providing adequate mitigation. The criteria for measuring performance will be used to determine if the conservation component is trending toward sustainability (reduced human intervention) and to assess the need for adaptive management (e.g., changes in design or maintenance revisions). These criteria must be met for the conservation component to be declared successful, both during a particular monitoring year and at the end of the establishment period. These performance criteria, which will be developed in consultation with USFWS, NMFS, and DFG, shall include, but are not limited to: percent survival of planted trees, percent survival of any transplanted trees, and percent relative canopy cover.

SAFCA shall also enter into agreements with entities responsible for long-term management of created SRA habitats to ensure that performance standards and long-term management goals are met. SAFCA shall provide assurances of adequate funding for habitat creation and management. Such agreements shall be coordinated with USFWS, NMFS, and DFG. SAFCA shall implement all terms and conditions of the agreements.

- SAFCA shall consult with DFG regarding potential disturbance to fish habitat, including SRA, and shall obtain a streambed alteration agreement, pursuant to Section 1602 of the California Fish and Game Code, for construction work associated with levee improvements made on the waterside of a levee. SAFCA shall comply with all permit conditions of the streambed alteration agreement to protect fish habitat or to restore, replace, or rehabilitate any SRA habitat on a no-net-loss basis.

- USACE shall initiate Section 7 consultation with the National Marine Fisheries Service (NMFS) under Section 7 of the Federal Endangered Species Act (ESA), and SAFCA shall consult with DFG under the California Endangered Species Act (CESA) regarding potential impacts of the loss of SRA habitat on Federally listed fish species and state-listed fish species, respectively. SAFCA shall implement any additional measures developed through the ESA Section 7 and CESA consultation processes, including Section 2081 permit conditions to ensure no net loss of habitat function.

Implementing this mitigation measure would reduce the impact to a **less-than-significant** level for the Proposed Action because SAFCA would ensure that any loss of SRA habitat for fish would be restored, replaced, and/or rehabilitated in consultation with USFWS, NMFS, and DFG and appropriate permits would be obtained. Potential impacts associated with implementation of this mitigation measure would be similar to those described above under Impact 4.6-a for other construction activities and would be reduced to a less-than-significant level through the implementation of Mitigation Measure 4.6-a.

PAGES 4.6-5 AND 4.6-6

In response to Comment S5 Letter and to provide additional clarification and detail, Impact 4.6-c, "Interference with the Migration of Migratory Fish Species through the Creation of Attraction Flows at the RD 1000 Pumping Plant No. 2 Outfall and Drainage Outfalls," on pages 4.6-5 and 4.6-6 of the Phase 3 DEIS/DEIR is revised as follows:

Impact 4.6-c: Interference with the Migration of Migratory Fish Species through the Creation of Attraction Flows at the RD 1000 Pumping Plant No. 2 Outfall and Drainage Outfalls

Proposed Action and Levee Raise-in-Place Alternative

The Phase 3 Project includes relocating and replacing RD 1000 Pumping Plant No. 2 and constructing several drainage outfalls.

Pumping Plant No. 2 was removed in response to underseepage observed during severe winter storms in January 2006 and must be relocated farther landward of the levee to resolve levee instability issues. Once the new pumping plant is built, the water would be carried from the pump to the outfall by three 36-inch pipes. The replacement discharge piping would be raised such that it would cross the levee above the "200-year" flood level. The piping would then angle down towards the river and discharge at a roughly horizontal angle. The Pumping Plant No. 2 outfall is anticipated to be roughly 2–3 feet above the "normal" water level and would be constructed of reinforced concrete. Flap gates would be provided for each of the discharge pipes to prevent backflow and entry. Water quality in the Pumping Plant No. 2 discharge water would be required to meet NPDES permit requirements (see Mitigation Measures 4.6-a and 4.5-c); therefore, operation of this facility would not substantially degrade water quality in the Sacramento River.

Several drainage outfalls are proposed to be constructed along the Sacramento River east levee. Each drain is designed to accommodate flows generated from runoff in the areas between the existing levee and proposed adjacent levee during a 10-year storm event. No additional surface runoff would be directed to or conveyed through the drains under future project phases. Drainage pipes are anticipated to vary in size from 12 to 15 inches in diameter. All of the drainage outfalls are anticipated to be located above the ordinary high-water mark of the river. Water quality of the runoff is anticipated to be similar to the runoff that currently occurs on the water side of the existing levee (through drainage of stormwater over the crest of the levee).

Anadromous salmonids, during their spawning migrations in the Sacramento River, use primarily olfactory cues to home to their natal streams once they reach the freshwater environment. There is the potential that the flows from Pumping Plant No. 2 and/or drainage outfalls would have olfactory cues and create velocity gradients that could attract these fish to attempt to swim up the water discharge. During fall and winter, adult chinook and steelhead are in the river migrating upstream to spawning grounds. If these fish become attracted to the flows from the outfall pipes, there is a potential to cause migration delays. With high river levels, the pump and drainage outfalls could create a condition where fish could enter the pipes. However, because salmonids imprint on olfactory cues particular to their stream of origin, the probability of flows from the pump or drainage outfalls interfering with migrations is low. Therefore, implementation of the Phase 3 Project would likely not result in substantial interference with the movement of native resident or migratory fish species. Therefore, this is considered a **less-than-significant** impact. ***(Similar)***

REVISIONS TO SECTION 4.7, "SENSITIVE AQUATIC HABITATS"

PAGES 4.7-2

Based on a design refinement in Reach 5A of the Sacramento River east levee (see Section 2.1, "Changes to the Phase 3 Project," of this FEIR for details), Table 4.7-1 on page 4.7-2 of the Phase 3 DEIS/DEIR is revised as follows:

Table 4.7-1
Estimated Impacts on Jurisdictional Waters of the United States for the Phase 3 Project

Feature	Functional Value[1]	Proposed Action		Levee Raise-in-Place Alternative	
		Temporary Impact (Acres)	Permanent Impact (Acres)	Temporary Impact (Acres)	Permanent Impact (Acres)
Construction of Sacramento River East Levee Improvements					
Irrigation Ditches (Fill)	Low		2.23		2.23
Field Drain (Fill)	Low		0.94		0.94
Airport West Ditch (Fill)	Moderate		9.0		9.0
Open Water (Fill)	Low		0.30		0.30
Seasonal Wetland (Fill)	Moderate		~~0.14~~5.87		0.14
Freshwater Marsh (Fill)	High		0.58		0.58
Sacramento River Waterside[2] Erosion Site G (Fill)	High		-		7.8
Raising and Flattening of Pleasant Grove Creek Canal West Levee					
Irrigated Wetland (Fill)	Moderate	2.06		2.06	
Irrigation Ditch (Fill)	Low		0.88		0.88
PGCC Waterside Erosion Control Rock Blanket (Fill)	High		<1.0		<1.0
Landside Rock Blanket into Existing Drainage Ditches (Fill)	Low		<0.25		<0.25
Natomas East Main Drainage Canal West Levee					
Seasonal Wetland (Fill)	Moderate		0.03		0.03
Vernal Pools (Fill)[3]	High		<1		<1
Construction of New Elkhorn Canal and GGS/Drainage Canal					
Irrigation and Drainage Ditches (Fill)	Low		3.01		3.01
Seasonal Wetland (Fill)	Moderate		0.45		0.45
Freshwater Marsh (Fill)	High		0.17		0.17
Reconstruction of RD 1000's Pumping Plant No. 2					
Irrigation and Drainage Ditches (Fill)	Low		0.61		0.61
Sacramento River Waterside Erosion Control Rip Rap (Fill)	High		<0.25 acre		<0.25 acre

Table 4.7-1
Estimated Impacts on Jurisdictional Waters of the United States for the Phase 3 Project

Feature	Functional Value[1]	Proposed Action		Levee Raise-in-Place Alternative	
		Temporary Impact (Acres)	Permanent Impact (Acres)	Temporary Impact (Acres)	Permanent Impact (Acres)
Drainage Outfalls in Sacramento River (Fill)	High		<0.1 acre		-
Borrow Site and Haul Road Construction					
Drainage Ditches and Canals (Fill/Dewater)	Low	8.26	0.78	8.26	0.78
Seasonal Wetland (Fill/Dewater)	Moderate	0.82		0.82	
Irrigated Wetland (Fill of Brookfield Borrow Site)	Moderate	59.28	0.20	59.28	0.20
Potential Irrigated Wetland (Fill of Sutter Pointe and Dunmore Potential Borrow Sites)	Moderate	(283.59)[4]		(283.59)[4]	
Elkhorn Borrow Area Drainage, Irrigation, and Field Ditches (Fill)	Low		<5.0		<5.0
P-6 Drain Stabilization Protection (Fill)	Low		<0.25		<0.25
Total Potential Impacts on Waters of the United States	Minimum Maximum	**70.42** **(354.01)[4]**	**~~22.17~~28.04** **~~27.17~~33.04[5]**	**70.42** **(354.01)[4]**	**29.87** **34.87[5]**

Notes: PGCC = Pleasant Grove Creek Canal; GGS = Giant Garter Snake; RD = Reclamation District

1 Functional value definitions: High = Natural structure and function of biotic community maintained, with minimal changes evident. Moderate = Moderate changes in structure and function of biotic community—i.e., moderate level of disturbance. Low = Severe changes in structure and/or function of biotic community evident—i.e., high level of disturbance. See Section 3.3.7 in Chapter 3.0, "Affected Environment," for additional information.

2 Section 404 of the Clean Water Act and Section 10 of the Rivers and Harbors Act authorizations are required for work on the waterside of the levee.

3 Assessment based on Panhandle Delineation (SPK-2005-01087).

4 Maximum potential temporary impact at Sutter Pointe and Dunmore sites based on preliminary fieldwork and review of aerials. Wetland delineations have not all been verified by USACE.

5 Includes all Elkhorn Borrow Area Drainage, Irrigation, and Field Ditches.

Sources: Data provided by Wood Rodgers in 2008, Mead & Hunt in 2008, and HDR, Inc. in 2008, and compiled by EDAW in 2008 and 2009

PAGES 4.7-3

Based on a design refinement in Reach 5A of the Sacramento River east levee (see Section 2.1, "Changes to the Phase 3 Project," of this FEIR for details), the third paragraph on page 4.7-3 of the Phase 3 DEIS/DEIR (Impact 4.7-a, "Impacts on Jurisdictional Waters of the United States") is revised as follows:

> The Proposed Action, which includes a number of potential borrow sites, would, if all the borrow sites were affected, result in temporary impacts to 354.01 acres and permanent impacts to ~~27.17~~ 33.04 acres of waters of the United States, including wetlands (**Table 4.7-1**). These impacts

would result from construction along the Sacramento River east levee, PGCC west levee, NEMDC west levee, new Elkhorn Canal and GGS/Drainage Canal, and construction activities at the borrow sites and along haul roads.

PAGES 4.7-5 AND 4.7-6

As a result on on-going coordination with resources agencies and design refinements, Mitigation Measure 4.7-a, "Minimize Effects on Jurisdictional Waters of the United States, Complete Detailed Design of Habitat Creation Components and Secure Management Agreements to Ensure Compensation of Waters Filled, and Comply with Section 404, Section 401, Section 10, and Section 1602, Permit Process," is revised as follows:

Mitigation Measure 4.7-a: Minimize Effects on Jurisdictional Waters of the United States, Complete Detailed Design of Habitat Creation Components and Secure Management Agreements to Ensure Compensation of Waters Filled, and Comply with Section 404, Section 401, Section 10, and Section 1602, Permit Processes

Proposed Action and Levee Raise-in-Place Alternative

SAFCA shall implement the measures described below to reduce impacts related to loss or fill of jurisdictional waters of the United States.

- Waters of the United States, including wetlands, shall be identified and the primary engineering and construction contractors shall ensure, through coordination with a qualified biologist(s), that construction is implemented in a manner that minimizes disturbance of canals, ditches, and seasonal wetlands. Temporary fencing shall be used during construction to prevent disturbance of waters of the United States that are located adjacent to construction areas but can be avoided.

- To mitigate for permanent impacts to sensitive aquatic resources, at least 1 acre of aquatic habitat (irrigation/drainage canal) or wetland shall be created for every acre that is lost to ensure no net loss of sensitive aquatic habitat. The mitigation ratio that is ultimately required will be determined by USACE through the Section 404 permitting process. The Phase 3 Project includes construction of approximately 11 acres of canal habitat within the new GGS/Drainage Canal and approximately 4.5 acres within the replaced Elkhorn Canal. The overall program would include approximately 60 acres of new canal-associated habitat, resulting from construction of the new GGS/Drainage Canal and replacement of the Elkhorn and Riverside Canals.

  In addition, construction of approximately 20 acres of wetlands within a 100-acre managed marsh complex would be created in the Fisherman's Lake Area as part of the Phase 4a Project, which is planned to be constructed concurrently with Phase 3 Project. The Phase 4a DEIS/DEIR is scheduled for public release in summer 2009.

- Develop and implement a Mitigation and Monitoring Plan (MMP) and Long-Term Management Plan (LTMP), before construction commences, in coordination with USACE, USFWS, and DFG. The MMP and LTMP shall provide designs of habitat creation components, and performance standards, and management protocols. SAFCA shall also enter into agreements with entities responsible for long-term management of created canals and marsh habitats to ensure that performance standards and long-term management goals are required by the regulatory agencies

with jurisdiction over these resources will be specifically detailed and outlined in the LTMP and MMP. All performance standards and long-term management goals will be in full compliance with ESA and CESA. Such agreements shall be coordinated with USACE, USFWS, and DFG. SAFCA shall secure all such agreements and implement all conditions of the agreements.

- Obtain the following applicable permits prior to the start of construction activities that would affect the resources covered by these permits: an individual permit pursuant to Section 404 of the Clean Water Act and Section 10 of the Rivers and Harbors Act from USACE, Section 401 certification from the Central Valley Regional Water Quality Control Board, and a Section 1602 streambed alteration agreement from DFG. All measures adopted through these permitting processes shall be implemented by SAFCA.

Overall, because the action alternatives would include the creation of waters of the United States that are expected to be more extensive than those filled by the project, and because implementing this mitigation measure including coordination with and issuance of the permits by the aforementioned resource/regulatory agencies, would ensure that no net loss of sensitive aquatic habitats occurs and that new jurisdictional waters would be managed in a manner that minimizes maintenance disturbance and provides the essential functions of the habitats that would be lost, both the Proposed Action and the Levee Raise-in-Place Alternative, with implementation of this mitigation measure, would have a **less-than-significant (beneficial)** impact on the overall acreage and quality of waters of the United States in the Natomas Basin. ***(Similar)***

REVISIONS TO SECTION 4.8, "VEGETATION AND WILDLIFE"

PAGES 4.8-4 AND 4.8-5

In response to Comment Letter S5, Mitigation Measure 4.8-a, "Loss of Woodland Habitats," on page 4.8-4 and 4.8-5 of the Phase 3 DEIS/DEIR is revised as follows:

Mitigation Measure 4.8-a: Minimize Effects on Woodland Habitat, ~~Complete Detailed Design of Woodland Creation and Management Agreements to Ensure Compensation for Loss of Habitat,~~ Implement all Woodland Habitat Conservation Components and Management Agreements, Compensate for Loss of Habitat, and Comply with the DFG Section 1602 Permit Process

Proposed Action and Levee Raise-in-Place Alternative

To reduce impacts on the loss of woodland habitat, SAFCA shall implement the measures described below:

- Native woodland areas shall be identified and the primary engineering and construction contractors shall ensure, through coordination with a qualified biologist retained by SAFCA, that construction is implemented in a manner that minimizes disturbance of such areas to the extent feasible. Temporary fencing shall be used during construction to prevent disturbance of native trees that are located adjacent to construction areas but can be avoided.

- ~~All native trees removed (and not transplanted) shall be replaced with an appropriate number of native plantings, based on the diameter at breast height (dbh) of the removed tree. The exact number of replacement plantings shall be determined in coordination with DFG but is anticipated to be consistent with the following recent DFG requirements: three replacement trees for each removed tree of 4–9 inches dbh, four replacement trees for each removed tree of 9–18 inches dbh, and one replacement tree for each inch of diameter removed of trees greater than 18 inches dbh. The woodland planting sites shall be seeded with native perennial grasses when trees are planted. The site designs shall include open woodland canopy for grassland savannah with edge habitat surrounding small open meadows and inclusions of seasonal wetlands where natural drainage at specific sites is feasible. SAFCA shall develop a detailed woodland planting design and management protocols in coordination with USFWS, DFG, and SCAS (if on Airport property). SAFCA shall also enter into agreements with entities responsible for long-term management of created woodland habitats to ensure that performance standards and long-term management goals are met and provide assurances of adequate funding for habitat creation and management. Such agreements and funding assurances shall be subject to approval of USFWS and DFG. SAFCA shall implement all terms and conditions of the agreements.~~

- SAFCA shall coordinate with USFWS, DFG, and SCAS (if on Airport property) to ensure that all woodland habitat conservation components of the NLIP are created and managed in accordance with the Phase 3 Project description and as described in Section 2.3.3, "Habitat Conservation Components," of the Phase 3 DEIS/DEIR. SAFCA shall prepare a project-specific MMP and programmatic LTMP to ensure the creation and long-term management of these components (see Section 2.3.3.5, "Long-Term Management of Habitat Components") before construction commences. SAFCA shall enter into agreements with the appropriate local entity responsible for long-term management of these created woodland habitats and shall coordinate with USFWS and DFG to ensure that performance standards and long-term management goals that are required by the regulatory agencies with jurisdiction over these resources will be specifically detailed and outlined in the LTMP and MMP. All performance standards and long-term management goals will be in full compliance with ESA and CESA. SAFCA shall implement all terms and conditions of the agreements.

- A Section 1602 streambed alteration agreement from DFG shall be obtained before any trees within a stream zone under DFG jurisdiction are removed, and all terms and conditions of the agreement shall be implemented by SAFCA.

Implementing this mitigation measure, along with the habitat conservation components of the Phase 2 Project, would minimize adverse effects of the Proposed Action on woodland habitat because ~~when this measure is coupled with~~ the amount of landside woodlands that ~~is~~would be~~ing~~ created and preserved as part of the Phase 2 Project along with the Phase 3 Project~~. The result is a net~~ would result in an increase of ~~52.5~~ 34 acres of landside woodlands in the Basin. The habitat conservation components~~, which~~ would

reduce long-term impacts to woodland habitats to a **less-than-significant** level. However, in the short-term, this impact would remain **significant and unavoidable** because replacement plantings would require a minimum of 10 to 15 years before providing important habitat components such as shade and structure ~~to mature~~.

While the woodland restoration and preservation proposed for the Levee Raise-in-Place Alternative may be adequate to offset the removal of landside woodlands, these replacement woodlands would not be adequate to compensate for the extensive loss of mature waterside vegetation. ~~Additional woodland mitigation could be provided through the purchase of credits from an authorized woodland mitigation bank; however, there are currently no such banks in operation along the Sacramento River.~~ Thus, the loss of woodland habitat for the Levee Raise-in-Place Alternative would remain **significant and unavoidable**. ***(Greater)***

PAGE 4.8-6

Due to a Memorandum of Agreement between the Federal Aviation Administration (FAA), U.S. Air Force, U.S. Army, U.S. Environmental Protection Agency (EPA), U.S. Fish and Wildlife Service (USFWS), and the U.S. Department of Agriculture (USDA) that addresses existing and future environmental conditions contributing to aircraft-wildlife collision, SAFCA determined that the planned 10 acres of marsh associated with the GGS/Drainage Canal could result in a hazard to public safety. As a result, the second paragraph of Impact 4.8-b, "Impacts on Wildlife Corridors," under "Proposed Action" on page 4.8-6 of the Phase 3 DEIR/DEIR is revised as follows:

> Under the Proposed Action, a total of approximately 16 acres of canal habitat would be permanently lost due to the filling and relocation of the Elkhorn Canal (5 acres), the redesign and reconfiguration of the Airport West Ditch (9 acres), placing rip rap on the water side of the PGCC for erosion control (1 acre), and the filling and relocation of private irrigation facilities (1 acre). SAFCA proposes to offset this impact by creating 22 acres of new canal habitat~~, 10 acres of associated marsh,~~ and ~~22~~ 32 acres of associated upland habitat.

REVISIONS TO SECTION 4.9, "SPECIAL-STATUS TERRESTRIAL SPECIES"

PAGE 4.9-3

In response to Comment Letter S5, Mitigation Measure 4.9-a, "Conduct Focused Surveys for Special-Status Plants, Minimize Effects, and Develop Detailed Design of Created Habitat and Management Agreements to Ensure Compensation for Loss of Habitat, and Implement all Management Agreements," on page 4.9-3 of the Phase 3 DEIS/DEIR is revised as follows:

> **Mitigation Measure 4.9-a: Conduct Focused Surveys for Special-Status Plants, Minimize Effects, ~~and Develop Detailed Design of Created Habitat and Management Agreements to Ensure Compensation for Loss of Habitat,~~ and Compensate for Loss of Habitat ~~Implement all Management Agreements~~**
>
> **Proposed Action and Levee Raise-in-Place Alternative**
>
> To reduce impacts on special-status plant species, SAFCA shall implement the measures described below.
>
> - Before any ground-disturbing activities begin, a qualified biologist retained by SAFCA shall conduct surveys for special-status plants in appropriate habitat within the project footprint, in accordance with

USFWS and/or DFG guidelines and at the appropriate time of year when the target species would be clearly identifiable. If no special-status plants are found during focused surveys, no further action shall be required.

- If special-status plants are found in the project footprint, areas of occupied habitat shall be identified and the primary engineering and construction contractors shall ensure, through coordination with the biologist, that construction activities are implemented in a manner that minimizes disturbance of these areas (e.g., temporary fencing shall be used during construction to protect all occupied habitat that is located adjacent to construction areas that can be avoided).
- If special-status plants are present in areas that cannot be avoided, SAFCA shall coordinate with USFWS and DFG to determine whether transplanting would be appropriate to further minimize adverse effects. Affected plants may potentially be transplanted to the GGS/Drainage Canal, if feasible. At least 1 acre of irrigation/drainage canal or marsh habitat shall be created for every acre of occupied special-status plant habitat that is lost.
- If special-status plants cannot be avoided, seed shall be collected and propagated at a DFG-approved nursery to provide additional plantings and transplanted during the dormant season if feasible to an approved site. Additionally, a mitigation plan shall be developed and approved by DFG. The plan shall include success criteria and specific requirements for planting, monitoring, and remediation in the event that success criteria cannot be met. Mitigation sites shall be permanently protected and managed in perpetuity.
- ~~SAFCA shall develop detailed design of habitat creation components and management protocols in coordination with and subject to approval of the resource agencies. SAFCA shall also enter into agreements with entities responsible for long-term management of created canals and marsh habitats to ensure that performance standards and long-term management goals are met and provide assurances of adequate funding for habitat creation and management. Such agreements and funding assurances shall be subject to approval of USFWS and DFG. SAFCA shall implement all terms and conditions of the management agreements.~~

Implementing this mitigation measure would reduce the impact on special-status plants to a **less-than-significant** level because SAFCA would conduct protocol-level plant surveys in accordance with applicable regulatory agency (e.g., USFWS, DFG, and CNPS) protocols at the appropriate time of year, ensure no-net-loss of special-status plant species habitat (if plants are present) including collection and propagation of seeds, avoid plant populations (if present) to the maximum extent feasible, and consult with the appropriate regulatory agencies to develop an implementation plan to further minimize impacts. ***(Similar)***

PAGES 4.9-5 AND 4.9-6

In response to Comment Letter S5, Mitigation Measure 4.9-b, "Conduct Focused Surveys for Elderberry Shrubs as Needed, Complete Detailed Design of Woodland/Elderberry Habitat and Management Agreements to Ensure

Adequate Compensation for Loss of Shrubs, Implement all Management Agreements, and Obtain Incidental Take Authorization," on pages 4.9-5 and 4.9-6 of the Phase 3 DEIS/DEIR is revised as follows:

Mitigation Measure 4.9-b: Conduct Focused Surveys for Elderberry Shrubs as Needed, ~~Complete Detailed Design of Woodland/Elderberry Habitat and Management Agreements to Ensure Adequate Compensation for Loss of Shrubs and~~ Implement All Woodland Habitat Conservation Components and all Management Agreements, Ensure Adequate Compensation for Loss of Shrubs, and Obtain Incidental Take Authorization

Proposed Action and Levee Raise-in-Place Alternative

To reduce impacts on valley elderberry longhorn beetle, SAFCA shall implement the measures described below.

- A qualified biologist retained by SAFCA shall conduct focused surveys of elderberry shrubs within 100 feet of the project footprint, in accordance with USFWS guidelines. All elderberry shrubs with potential to be affected by project activities shall be mapped, the number of stems greater than 1 inch in diameter on each shrub that requires removal shall be counted, and these stems shall be searched for beetle exit holes.

- The primary engineering and construction contractors shall ensure, through coordination with the biologist, that construction is implemented in a manner that minimizes disturbance of areas that support elderberry shrubs (e.g., temporary fencing shall be used during construction to protect all elderberry shrubs that are located adjacent to construction areas but can be avoided). Shrubs that require removal shall be transplanted to the woodland creation areas, if feasible. If none of the areas of suitable habitat to be created as part of the project would be available before the impact would occur, alternative transplantation locations (e.g., other SAFCA mitigation areas or TNBC preserves) shall be identified and shall be approved by USFWS.

- The number of replacement elderberry plantings shall be determined based on USFWS guidelines, which require replacement ratios ranging from 1:1 to 8:1 for lost stems at least 1 inch in diameter, depending on the size of the affected stems and presence or absence of beetle exit holes. Associated native species shall be planted at ratios ranging from 1:1 to 2:1 for each elderberry planting.

- SAFCA shall coordinate with USFWS, DFG, and SCAS (if on Airport property) to ensure that woodland habitat conservation components of the NLIP are created and managed as described in Section 2.3.3, "Habitat Conservation Components," in the Phase 3 DEIS/DEIR. SAFCA shall prepare a project-specific MMP and programmatic LTMP to ensure the creation and long-term management of these components (see Section 2.3.3.6, "Long-Term Management of Habitat Components") before construction commences. SAFCA shall enter into agreements with the appropriate local entity responsible for long-term management of these created woodland habitats and shall coordinate with USFWS and DFG to ensure that performance standards and long-term management goals that are required by regulatory agencies with jurisdiction over these resources will be specifically detailed and outlined in the LTMP and MMP. All performance standards and long-term management goals will be in full

compliance with ESA and CESA. SAFCA shall implement all terms and conditions of the management agreements.

- ~~SAFCA shall develop a detailed woodland/elderberry planting design and management protocols in coordination with and subject to approval of the resource agencies. SAFCA shall also enter into agreements with entities responsible for long-term management of created woodland habitats to ensure performance standards and long-term management goals are met and provide assurances of adequate funding for habitat creation and management. Such agreements and funding assurances shall be subject to approval of the resource agencies. SAFCA shall implement all terms and conditions of the management agreements.~~

- USACE shall initiate consultation activities with USFWS under Section 7 of the Federal ~~Endangered Species Act (~~ESA~~)~~, and authorization for take of valley elderberry longhorn beetle under the Federal ESA shall be obtained if it is determined, in consultation with USFWS, that shrub removal is likely to result in such take. All measures subsequently developed through the Section 7 consultation process shall be implemented by SAFCA.

Implementing this mitigation measure would reduce the impact on valley elderberry longhorn beetle to a **less-than-significant** level because protocol-level surveys would be conducted, construction activities would avoid elderberry shrubs to the maximum extent feasible, elderberry shrub replacement would occur in consultation with USFWS, habitat conservation components would be implemented, and USACE would consult with USFWS under Section 7. ***(Similar)***

PAGE 4.9-7

Due to a Memorandum of Agreement between the FAA, U.S. Air Force, U.S. Army, EPA, USFWS, and USDA that addresses existing and future environmental conditions contributing to aircraft-wildlife collision, SAFCA has determined that the planned 10 acres of marsh associated with the GGS/Drainage Canal could result in a hazard to public safety. As a result, Table 4.9-2 on page 4.9-7 of the Phase 3 DEIS/DEIR is revised as follows:

Table 4.9-2
Permanent Impacts of the Phase 3 Project Alternatives on Giant Garter Snake Habitat

Location	No-Action Alternative	Proposed Action and Levee Raise-in-Place Alternative (Acres)
Habitat Impacts		
Canal/ditch and Elkhorn Reservoir habitat near Sacramento River east levee	Unknown, but losses of TNBC preserve habitat and other agricultural habitats in the event of flooding could be substantial	5
Canal habitat near PGCC west levee	Unknown, but losses of TNBC preserve habitat and other agricultural habitats in the event of flooding could be substantial	< 1

Table 4.9-2 Permanent Impacts of the Phase 3 Project Alternatives on Giant Garter Snake Habitat		
Location	**No-Action Alternative**	**Proposed Action and Levee Raise-in-Place Alternative (Acres)**
PGCC (water side)	No impact	1
Airport West Ditch	No impact	9
Rice near PGCC west levee	Unknown, but losses of rice in the event of flooding could be substantial	45[1]
Total Permanent Impacts	**Unknown, but potentially substantial**	**16 canal/ditch; 45 rice**
Habitat Creation in Project Design		
Canal habitat (Aquatic)	0	22
Canal habitat (Associated Upland)	0	~~22~~32
~~Marsh habitat associated with Canal~~	~~0~~	~~10~~
Total Habitat Creation	**0**	**54**

Notes: TNBC = The Natomas Basin Conservancy; PGCC = Pleasant Grove Creek Canal

[1] The Phase 2 ~~Project~~ EIS identified permanent impacts to 72.98 acres of rice, which includes ~~this~~ 45 acres that would be affected as part of the Phase 3 Project. The USFWS programmatic BO is conditioned on the creation of 72.98 acres of managed marsh as part of the Phase 4 Project to offset the overall NLIP's~~project's~~ permanent impacts to rice.

Source: EDAW surveys in 2008; construction data provided by Wood Rodgers, Mead & Hunt, and HDR, Inc. in 2008 and 2009; and compiled by EDAW in 2008 and 2009

PAGE 4.9-8

Due to a Memorandum of Agreement between the FAA, U.S. Air Force, U.S. Army, EPA, USFWS, and USDA that addresses existing and future environmental conditions contributing to aircraft-wildlife collision, SAFCA has determined that the planned 10 acres of marsh associated with the GGS/Drainage Canal could result in a hazard to public safety. As a result, the fourth paragraph on page 4.9-8 of the Phase 3 DEIS/DEIR under Impact 4.9-c, "Impacts on Giant Garter Snake Related to Project Construction Activities," is revised as follows:

> In addition to the currently identified borrow sites listed in **Table 2-2**, the Elkhorn Borrow Area (**Plate 10**) has been identified as an area where additional borrow sites could be used, if needed. Any borrow site developed in the Elkhorn Borrow Area would potentially temporarily convert potential giant garter snake habitat to non-usable habitat (less than 5 acres of irrigation and drainage ditches). As described in Section 2.3.8, "Borrow Material," in selecting borrow sites, consideration would be given to ensure that activities result in minimal adverse impacts to the environment. Beneficial impacts to giant garter snake would include SAFCA's proposed creation of approximately 54 acres of habitat resulting from construction of the new GGS/Drainage Canal, expansion of the existing West Drainage Canal, and relocation of the irrigation canal. This habitat includes approximately 22 acres of aquatic canal habitat (12 acres for the newly constructed GGS/Drainage Canal, 7 acres for the relocated Elkhorn Canal, and 3 acres for the reconfigured West Drainage Canal)~~, approximately 10 acres of marsh habitat associated with the~~

~~GGS/Drainage Canal and West Drainage Canal,~~ and approximately ~~22~~32 acres of associated uplands for all the canals.

PAGE 4.9-9

In response to Comment Letter S5, Mitigation Measure 4.9-c, "Mitigation Measure 4.9-c: Minimize the Potential for Direct Loss of Giant Garter Snake Individuals, Develop Detailed Design of Managed Marsh and New Canals and Management Agreements to Ensure Adequate Compensation for Loss of Habitat, Implement all Management Agreements, and Obtain Incidental Take Authorization," on page 4.9-9 of the Phase 3 DEIS/DEIR is revised as follows:

Mitigation Measure 4.9-c: Minimize the Potential for Direct Loss of Giant Garter Snake Individuals, Implement All Upland and Aquatic Habitat Conservation Components ~~Develop Detailed Design of Managed Marsh and New Canals~~ and Management Agreements to Ensure Adequate Compensation for Loss of Habitat, ~~Implement all Management Agreements,~~ and Obtain Incidental Take Authorization

Proposed Action and Levee Raise-in-Place Alternative

To reduce impacts on the giant garter snake, SAFCA shall implement the measures described below.

- The primary engineering and construction contractors shall ensure, through coordination with a qualified biologist retained by SAFCA, that construction is implemented in a manner that minimizes disturbance of giant garter snake habitat (e.g., temporary fencing shall be used during construction to protect all aquatic and adjacent upland habitat that is located adjacent to construction areas that can be avoided).

- Additional measures consistent with the goals and objectives of the NBHCP shall be implemented to minimize the potential for direct injury or mortality of individual giant garter snakes during project construction. Such measures shall be finalized in consultation with USFWS and DFG, and are likely to include conducting worker awareness training, timing initial ground disturbance to correspond with the snake's active season (as feasible in combination with project needs and minimizing disturbance of nesting Swainson's hawks), dewatering aquatic habitat before fill, conducting preconstruction surveys, erecting fencing around habitat features that can be avoided to ensure that these remain undisturbed by construction vehicles and personnel, conducting biological monitoring during construction, and removing any temporary fill or construction debris and restoring temporarily disturbed areas to their pre-project conditions according to the USFWS's *Guidelines for the Restoration and/or Replacement of Giant Garter Snake Habitat* (USFWS 1997).

- SAFCA shall coordinate with USFWS, DFG, and SCAS (if on Airport property) to ensure that aquatic and upland habitat conservation components of the NLIP are created and managed as described in Section 2.3.3, "Habitat Conservation Components," in the Phase 3 DEIS/DEIR. SAFCA shall prepare a project-specific MMP and programmatic LTMP to ensure the creation and long-term management of these components (see Section 2.3.3.6, "Long-Term Management of Habitat Components") before construction commences. SAFCA shall enter into agreements with the appropriate local entity responsible for long-term management of

these created giant garter snake habitats and shall coordinate with USFWS and DFG to ensure that performance standards and long-term management goals are required by the regulatory agencies with jurisdiction over these resources will be specifically detailed and outlined in the LTMP and MMP. All performance standards and long-term management goals will be in full compliance with ESA and CESA. SAFCA shall implement all terms and conditions of the management agreements.

- ~~SAFCA shall develop detailed design of habitat creation components and management protocols in coordination with and subject to approval of USFWS and DFG. SAFCA shall also enter into agreements with entities responsible for long-term management of created canals and marsh habitats to ensure that performance standards and long-term management goals are met and provide assurances of adequate funding for habitat creation and management. Such agreements and funding assurances shall be subject to approval of USACE, USFWS, and DFG. SAFCA shall implement all terms and conditions of the management agreements.~~

- Authorization for take of giant garter snake under the Federal ESA and CESA shall be obtained. All measures subsequently adopted through the permitting process shall be implemented.

Implementing this mitigation measure would reduce this impact related to giant garter snake to a **less-than-significant** level because construction would be implemented in a manner that reduces loss of habitat and direct mortality, measures that are part of the NBHCP related to giant garter snake would be implemented, ~~a management plan would be created and~~ habitat conservation components of the NLIP would be ~~i~~mplemented in consultation with USFWS and DFG, and take permits would be obtained. ***(Similar)***

PAGES 4.9-13

In response to Comment S5-9 and to provide clarification regarding the proposed habitat conservation components for Swainson's hawk foraging habitat on agricultural lands, Impact 4.9-f, "Impacts on Swainson's Hawk and Other Special-Status Birds," of the Phase 3 DEIS/DEIR is revised as follows:

Impact 4.9-f: Impacts on Swainson's Hawk and Other Special-Status Birds

Proposed Action

Potential adverse effects on the Swainson's hawk would include loss of suitable foraging and nesting habitat and disturbance of nesting pairs during project construction. Other special-status birds, including white-tailed kite, ~~and~~ Cooper's hawk, and northern harrier, could also be similarly affected. The effects on foraging and nesting habitat would result from construction of levees, berms, and maintenance, operation, and utility corridors along the Sacramento River, PGCC, and NEMDC; the construction of the new GGS/Drainage and realigned Elkhorn Canals; reconstruction of RD 1000's Pumping Plant No. 2; and the creation of woodland corridors.

~~**Impacts to Foraging Habitat:** As summarized in **Table 4.9-3**, above, foraging habitat affected by the Proposed Action would be primarily croplands (115 of 184 acres) and grasslands (69 of 184 acres). This impact would be offset by the creation of 297 acres of foraging habitat, of which 60 acres would be croplands and 237 acres would be grasslands. As shown in **Table 4.9-4**, this~~

~~would result in a net increase of 113 acres of foraging habitat. However, due to conversion of land cover types in the project footprint, the composition of this habitat would permanently shift from 62% croplands (and 28% grasslands) to 20% croplands (and 80% grasslands), leading to a decrease in the quality of foraging habitat for Swainson's hawk. Approximately 55 acres (48%) of the total croplands being permanently affected are considered high-quality foraging habitat. The loss of high-quality foraging habitat could force Swainson's hawks to forage farther from the nest or increase competition for prey with other hawks in the area. To offset impacts to this high-quality foraging habitat, SAFCA would preserve approximately 60 acres of land in high-quality foraging habitat within reclaimed borrow sites. This would reduce the permanent impact to foraging habitat by ensuring preservation of field crops with the highest foraging value. The permanent loss of croplands represents 1.4% of the total estimated agricultural lands in the Basin and, therefore, is not considered a substantial reduction of foraging habitat.~~

~~Land cover conversion of the borrow sites would be temporary. Approximately 603 acres of foraging habitat would be temporarily affected by the Phase 3 Project borrow activities and then returned to their prior conditions within approximately 2 years. This would include 240 acres of fallow crop, 97 acres of alfalfa, 143 acres of other crops, and 115 acres of grasslands. Some of these borrow sites have been identified for field crop preservation to offset the impacts to foraging habitat. The selection of sites for field crop preservation lands, whether or not they are used as borrow sites, would be based on cropland parcels that would be suitable for farming alfalfa, hay, or other similar crops (e.g., well-drained, permeable soils) and that are located within reasonable proximity of potential Swainson's hawk nesting habitat. Where borrow sites are identified for field crop preservation, the limit of excavation would be, at minimum, 2 feet above the high water table. Further, these sites would be recontoured to have positive drainage so that the sites can be gravity-drained to collector drains off site to ensure that the root zones would not be saturated. Finally, the foot of topsoil removed and stockpiled prior to borrow removal would be respread over the borrow sites after soil excavation, thereby increasing the depth of soil above the water table.~~

~~In addition to the currently identified borrow sites listed in **Table 2-2**, the Elkhorn Borrow Area (**Plate 10**) has been identified as an area where additional borrow sites could be used, if needed. Any borrow site developed in the Elkhorn Borrow Area would potentially convert foraging habitat for special-status birds to non-foraging habitat temporarily (583 acres of cropland and 11 acres of grassland). As described in Section 2.3.8, "Borrow Material," in selecting borrow sites, consideration would be given to ensure that activities result in minimal adverse impacts to the environment, including habitat for Swainson's hawk and other special-status birds.~~

~~However, if habitat creation/preservation is not effectively implemented to provide foraging habitat for Swainson's hawk or other special-status bird species, an overall adverse effect could occur. This impact is considered **potentially significant**.~~

Impacts to Foraging Habitat: As summarized in **Table 4.9-3** above, foraging habitat permanently affected by the Proposed Action would be primarily croplands (115 of 184 acres) and grasslands (69 of 184 acres). This impact would be offset by the creation of 297 acres of foraging habitat, of which 60 acres would be croplands and 237 acres would be grasslands. As shown in **Table 4.9-4**, this would result in a net increase of 113 acres of foraging habitat. However, due to conversion of land cover types in the project footprint, the composition of this habitat would permanently shift from 62% croplands (and 38% grasslands) to 20% croplands (and 80% grasslands), leading to a decrease in the quality of foraging habitat for Swainson's hawk.

Borrow site activities would result in temporary impacts to Swainson's hawk foraging habitat. Approximately 595 acres of foraging habitat could be temporarily affected by the Phase 3 Project borrow activities, depending on borrow needs, and then returned to their prior conditions within approximately 2 years. This would include 240 acres of fallow crop, 97 acres of alfalfa, 143 acres of other upland crops, and 115 acres of grasslands. Some of these borrow sites have been identified for agricultural preservation to offset the project's impacts to foraging habitat. The selection of sites for agricultural preservation lands, whether or not they are used as borrow sites, would be based on agricultural parcels that would be suitable for farming alfalfa, hay, or other similar crops (e.g., well-drained, permeable soils) and that are located within reasonable proximity of potential Swainson's hawk nesting habitat. Where borrow sites are identified for agricultural preservation, the limit of excavation would be, at minimum, 2 feet above the high water table. Further, these sites would be recontoured to have positive drainage so that the sites can be gravity-drained to collector drains off-site to ensure that the root zones would not be saturated. Finally, the foot of topsoil removed and stockpiled prior to borrow removal would be respread over the borrow sites after soil excavation, thereby increasing the depth of soil above the water table.

In addition to the currently identified borrow sites listed in **Table 2-2**, the Elkhorn Borrow Area (**Plate 10**) has been identified as an area where additional borrow sites could be used, if needed. Any borrow site developed in the Elkhorn Borrow Area would potentially result in temporary conversion of foraging habitat for special-status birds to non-foraging habitat (583 acres of cropland and 11 acres of grassland). As described in Section 2.3.8, "Borrow Material," in selecting borrow sites, consideration would be given to ensure that activities result in minimal adverse impacts to the environment, including habitat for Swainson's hawk and other special-status birds.

The greatest impact to overall foraging habitat value would be the permanent loss of approximately 55 acres of alfalfa and grass hay, which are considered the highest value foraging habitat types for Swainson's hawks in the Central Valley. The loss of alfalfa, grass hay,-and other foraging habitats could result in Swainson's hawks having to forage farther from the nest or increase competition for prey with other hawks in the area. Several studies have documented the importance of hay crops, especially alfalfa for Swainson's hawks (Estep 1989, Estep 2008, and Woodbridge 1998). The characteristics that contribute to their high value include:

- low vegetation structure, which increases prey accessibility;
- relatively large prey populations due to abundant cover and food;
- farming operations, such as weekly irrigation, which increases cover and food for prey; and
- regular mowing, which lowers vegetation structure, disturbs prey and increases accessibility.

To offset impacts to this high-quality foraging habitat, SAFCA would acquire and preserve approximately 60 acres of land (preferably lands used to obtain borrow material as described in Chapter 2.0, "Alternatives") that would be managed specifically to optimize its value as foraging habitat for Swainson's hawk. This would be accomplished by creating habitat types (e.g., agricultural or other vegetation types) that can be managed to provide high-quality foraging habitat for Swainson's hawk throughout the nesting season. Other factors that would contribute to the value of the Swainson's hawk foraging habitat being preserved includes its proximity to other preserved habitat (i.e., larger contiguous parcels of suitable foraging habitat generally provide greater foraging value than smaller parcels) and managing foraging habitat for Swainson's hawk over the long term or in perpetuity. If successful, SAFCA's commitment to preserve high quality foraging habitat in combination with the creation of perennial grasslands would fully mitigate the loss of alfalfa, grass hay, and other foraging habitat types that would result from implementation of the NLIP. However, if habitat creation/preservation is not effectively implemented to provide

foraging habitat for Swainson's hawk or other special-status bird species, an overall adverse effect could occur. This impact is considered **potentially significant.**

PAGES 4.9-16 AND 4.9-17

In response to Comment Letter S5, Mitigation Measure 4.9-f, "Minimize Potential Impacts on Swainson's Hawk and Other Special-Status Birds Foraging and Nesting Habitat, Monitor Active Nests during Construction, Develop and Implement a Management Plan in Consultation with DFG, Obtain Incidental Take Authorization, and Implement Mitigation Measure 4.8-a, "Minimize Effects on Woodland Habitat, Complete Detailed Design of Woodland Creation and Management Agreements to Ensure Compensation for Loss of Quantity and Quality of Habitat, Implement all Agreements, and Comply with the DFG Section 1602 Permit Process"," on pages 4.9-16 and 4.9-17 of the Phase 3 DEIS/DEIR is revised as follows:

Mitigation Measure 4.9-f: Minimize Potential Impacts on Swainson's Hawk and Other Special-Status Birds Foraging and Nesting Habitat, Monitor Active Nests during Construction, Implement All Upland and Agricultural Habitat Conservation Components and ~~Develop and Implement a Management Plan in Consultation with DFG, Obtain Incidental Take Authorization, and Implement Mitigation Measure 4.8-a, "Minimize Effects on Woodland Habitat, Complete Detailed Design of Woodland Creation and~~ Management Agreements to Ensure Compensation for Loss of Quantity and Quality of Foraging Habitat, Obtain Incidental Take Authorization, Implement Mitigation Measure 4.8a, "Minimize Effects on Woodland Habitat, ~~Complete Detailed Design of Woodland Creation and Management Agreements to Ensure Compensation for Loss of Habitat,~~ Implement all Woodland Habitat Conservation Components and Management Agreements, Compensate for Loss of Habitat, and Comply with the DFG Section 1602 Permit Process,"

Proposed Action and Levee Raise-in-Place Alternative

SAFCA and its primary contractors for engineering design and construction shall ensure that the following measures are implemented to avoid, minimize, and compensate for potential project effects on Swainson's hawks and other special-status birds:

- The primary engineering and construction contractors shall ensure, through coordination with a qualified biologist retained by SAFCA, that construction is implemented in a manner that minimizes disturbance of potential nesting habitat for special-status birds through the following activities:
  - The biologist shall conduct preconstruction surveys to identify active special-status bird nests near construction areas.
  - Surveys for nesting birds shall be conducted before project activities are initiated during the nesting season (March 1–~~July 31~~ September 15). Surveys shall be conducted in accordance with standardized protocols and NBHCP requirements. Removal of potential nesting habitat shall be conducted during the non-nesting season, to the extent feasible and practicable, to minimize the potential for loss of active nests.
  - If an active nest is found, the biologist shall determine an appropriate buffer that minimizes potential for disturbance of the nest, in coordination with DFG. No project activities shall commence within the buffer area until a qualified biologist confirms that the nest is no longer active or the birds are not dependent on it. Monitoring shall be conducted during construction and by a qualified biologist to ensure

that project activity does not result in detectable adverse effects on the nesting pair or their young. The size of the buffer may vary, depending on the nest location, nest stage, construction activity, and monitoring results. If implementation of the buffer becomes infeasible or construction activities result in an unanticipated nest disturbance, DFG shall be consulted to determine the appropriate course of action.

- The primary engineering and construction contractors shall ensure, through coordination with a qualified biologist retained by SAFCA, that staging areas and access routes are designed to minimize disturbance of known Swainson's hawk nesting territories through the following activities:

  - The biologist shall conduct preconstruction surveys to identify active nests within ~~0.25~~ .5 mile of construction areas, in accordance with DFG guidelines. Surveys shall be conducted in accordance with NBHCP requirements and *Recommended Timing and Methodology for Swainson's Hawk Nesting Surveys in California's Central Valley* (Swainson's Hawk Technical Advisory Committee 2000).

  - If an active nest is found, an appropriate buffer that minimizes the potential for nest disturbance shall be determined by the biologist, in coordination with DFG. No project activities shall commence within the buffer area until a qualified biologist confirms that the nest is no longer active or the birds are not dependent on it. Monitoring shall be conducted during construction and by a qualified biologist to determine whether project activity results in detectable adverse effects on the nesting pair or their young. The size of the buffer may vary, depending on the nest location, nest stage, construction activity, and monitoring results. If implementation of the buffer becomes infeasible or construction activities result in an unanticipated nest disturbance, DFG shall be consulted to determine the appropriate course of action.

- ~~SAFCA shall develop and implement a plan to address management of grassland habitats that are created as part of the proposed project to ensure that the performance standard of no net loss of sensitive habitat is met. The management plan shall, at a minimum, establish specific success criteria for habitat creation, specify remedial measures to be undertaken if success criteria are not met (e.g., supplementary plantings and additional monitoring), and describe short- and long-term maintenance and management of the features (described in Chapter 2.0, "Alternatives," Section 2.3.3, "Conservation Components").~~

- ~~Long-term protection of the created features and funding for their management shall be provided through appropriate mechanisms to be determined by SAFCA, DFG, and other entities cooperating in implementation of the proposed project.~~

- SAFCA shall coordinate with USFWS, DFG, and SCAS (if on Airport property) to ensure that woodland, upland and agricultural habitat conservation components of the NLIP are created and managed as

described in Section 2.3.3, "Habitat Conservation Components," in the Phase 3 DEIS/DEIR. SAFCA shall prepare a project specific MMP and programmatic LTMP to ensure the creation and long-term management of these components (see Section 2.3.3.6, "Long Term Management of Habitat Components") before construction commences. SAFCA shall enter into agreements with the appropriate local entity responsible for long-term management of these created Swainson's hawk habitats and shall coordinate with USFWS and DFG to ensure that performance standards and long-term management goals that are required by the regulatory agencies with jurisdiction over these resources will be specifically detailed and outline in the LTMP and MMP. All performance standards and long-term management goals will be in full compliance with ESA and CESA. SAFCA shall implement all terms and conditions of the management agreements.

- ~~The management plan for the grassland habitat creation components of the project shall be reviewed and approved by USFWS and DFG before project implementation.~~ Authorization for take of Swainson's hawk under CESA shall be obtained. All measures subsequently adopted through the permitting process shall be implemented.

Implementation of this mitigation measure as well as Mitigation Measure 4.8-a, would minimize adverse effects of the Proposed Action on Swainson's hawk. This measure, ~~C~~coupled with the amount of land side woodlands that are being created and preserved~~,~~ as part of the Phase 2 Project, ~~this measure~~ would result in a net increase in potential nesting habitat (landside woodlands). In addition, approximately 60 acres of high quality foraging habitat would be preserved in the Basin. The creation and preservation of nesting and foraging habitat in the Basin would reduce long-term and overall impacts to Swainson's hawk to a **less-than-significant** level. However, in the short-term, this impact would remain **significant and unavoidable** because replacement plantings would likely require a minimum of 10 to 15 years before providing important habitat components such as structure and shade. ~~because of the time required for replacement woodlands to reach maturity, short-term temporal impacts to nesting habitat would remain **significant and unavoidable.**~~

Implementation of this mitigation measure as well as Mitigation Measure 4.8-a, would minimize long-term, adverse effects of the Levee Raise-in-Place Alternative on Swainson's hawk, but would not reduce them to a less-than-significant level. While the woodland restoration and preservation proposed for the Levee Raise-in-Place Alternative may be adequate to offset the removal of landside woodlands, these replacement woodlands would not be adequate to compensate for the extensive loss of mature waterside vegetation, therefore, ~~However, because it is uncertain whether the new woodlands would be adequate to compensate for the extensive loss of waterside riparian habitat and the potential extensive loss of Swainson's hawk nest sites on the water side of the Sacramento River east levee and because in the short-term replacement plantings would require 10 to 15 years to mature,~~ this impact would remain **significant and unavoidable.** ***(Greater)***

REVISIONS TO SECTION 4.12, "TRANSPORTATION AND CIRCULATION"

PAGE 4.12-3

To provide clarification and additional detail regarding hauling routes, the third full paragraph on page 4.12-3 of the Phase 3 DEIS/DEIR (Impact 4.12-a, "Temporary Increase in Traffic on Local Roadways") is revised as follows:

> Haul trips for borrow material are anticipated to average 950–1,100 trips per day for the Sacramento River east levee improvements (Reaches 5A–9B) and 100–200 trips per day for the PGCC west levee improvements. Hauling on Elkhorn Boulevard could exceed the ITE threshold during the a.m. or p.m. peak hour for use of the Pacific Terrace borrow site. Construction on the NEMDC west levee would use off-road haul routes from the East Side and Twin Rivers borrow sources; Sorento Road would not be used for hauling of earthen material for NEMDC construction. However, the anticipated three-month closure of sections of East Levee Road during construction of the cutoff wall could increase traffic on Sorento Road during peak hours.

PAGES 4.12-4 AND 4.12-5

In response to Comments L2-1 and L5-4, Mitigation Measure 4.12-a, "Prepare and Implement a Traffic Safety and Control Plan for Construction-Related Truck Trips," on pages 4.12-4 and 4.12-5 of the Phase 3 DEIS/DEIR is revised as follows:

> **Mitigation Measure 4.12-a: Prepare and Implement a Traffic Safety and Control Plan for Construction-Related Truck Trips**
>
> **Proposed Action** Before the start of construction in each construction season, SAFCA and its primary contractors for engineering and construction shall develop a coordinated construction traffic safety and control plan to minimize the simultaneous use of roadways by different construction contractors for material hauling and equipment delivery to the extent feasible and to avoid and minimize potential traffic hazards on local roadways during construction. Upon selection of borrow sites within the Elkhorn Borrow Area, the traffic safety and control plan shall reflect affected roadways. Items (a) through (e) of this mitigation measure, as listed below shall be integrated as terms of the construction contracts.
>
> (a) The plan shall outline phasing of activities and the use of multiple routes to and from off-site locations to minimize the daily amount of traffic on individual roadways. SAFCA shall ensure that the construction contractors enforce the plans throughout the construction periods.
>
> (b) The construction contractors shall develop traffic safety and control plans for the local roadways that would be affected by construction traffic. Before the initiation of construction-related activity involving high volumes of traffic, the plan shall be submitted for review by Caltrans and the agencies of the local jurisdictions (Sutter County, Sacramento County, and/or City of Sacramento) having responsibility for roadway safety at and between project sites. The plan shall call for the following elements:

- posting warnings about the potential presence of slow-moving vehicles;
- using traffic control personnel when appropriate; and
- placing and maintaining barriers and installing traffic control devices necessary for safety, as specified in Caltrans's *Manual of Traffic Controls for Construction and Maintenance Works Zones* and in accordance with city/county requirements (Caltrans 1996).

The contractor shall train construction personnel in appropriate safety measures as described in the plan and shall implement the plan. The plan shall include the prescribed locations for staging equipment and parking trucks and vehicles. Provisions shall be made for overnight parking of haul trucks to avoid causing traffic or circulation congestion.

(c) All operations shall limit and expeditiously remove, as necessary, the accumulation of project-generated mud or dirt from adjacent public streets at least once every 24 hours if substantial volumes of soil have been carried onto adjacent paved public roadways during project construction.

(d) Construction of project features along the Sacramento River east levee shall be accommodated through the creation of temporary haul roads along the landside of the adjacent levee and berm footprint. Garden Highway shall not be used for earthen materials hauling activities.

(e) A Transportation Management Plan shall be prepared and submitted to Caltrans District 3 to cover any points of access from the state highway system for haul trucks and other construction equipment.

(f) Before the start of the first construction season, SAFCA shall coordinate with Sacramento and Sutter Counties and the City of Sacramento to address maintenance and repair of affected roadways resulting from increased truck traffic.

(g) Before project construction begins, SAFCA shall provide notification of project construction to all appropriate emergency service providers in Sutter County, Sacramento County, and/or the City of Sacramento and shall coordinate with providers throughout the construction period to ensure that emergency access through construction areas is maintained.

(h) Before the start of construction, SAFCA and its primary contractors shall coordinate with Sacramento and Sutter Counties regarding any closures of Garden Highway.

Implementation of this mitigation measure would reduce the level of impact, but not to a less-than-significant level. However, given the high amount of hauling required for the Proposed Project and the Levee Raise-in-Place Alternative, and the limited number of roadways in the project vicinity that would be suitable for hauling between borrow sites and project construction sites, it is possible that the volume of traffic during some periods may still exceed ITE thresholds despite the implementation of this measure. Because

no other feasible mitigation measures are available to fully reduce this impact to a less-than-significant level, this impact would remain **significant and unavoidable**.

PAGE 4.12-6

To provide clarification and additional detail regarding potential impacts on Sorento and East Levee Roads, the first paragraph on page 4.12-6 of the Phase 3 DEIS/DEIR (Impact 4.12-b, "Temporary Increase in Traffic Hazards on Local Roadways," under "Proposed Action") is revised as follows:

> Pavement sections on the rural Sacramento and Sutter County roadways in the project area were designed to carry low-volume traffic. The high-volume truck traffic during construction would accelerate wear and tear on West Elverta Road between the Dunmore borrow site and the Sacramento River east levee and on West Elkhorn Boulevard between the Pacific Terrace borrow site and the Sacramento River east levee. Similarly, haul routes that would be used to access selected borrow sites within the Elkhorn Borrow Area could potentially affect West Elkhorn Boulevard, School House Road, and/or Walnut Road. The approximately three-month closure of sections of East Levee Road during construction on the NEMDC west levee could increase the volume of traffic on alternative roads, such as Sorento Road. Besides shortening the life of pavement sections, high-volume truck traffic and additional traffic from residents using alternative travel routes could cause road damage, such as cracks and potholes, which could create road hazards for other motorists.

PAGE 4.12-7

In response to Comment O4-17, the fourth paragraph on page 4.12-7 of the Phase 3 DEIS/DEIR (Impact 4.12-c, "Temporary Disruption of Emergency Service Response Times and Access," under "Proposed Action") is revised as follows:

> The Proposed Action would result in increased traffic on local roadways associated with construction trips. In addition, temporary road closures associated with levee improvements could cause or contribute to temporary increases in traffic levels as traffic is detoured or slowed on some local roadways and SR 99/70. Increased traffic congestion could interfere with the use of main roadways for emergency evacuation routes. Garden Highway is the primary access for homes and businesses located on the water side of the levee. Temporary construction closures, including an approximately 8–12-week closure of Garden Highway at the I-5 Bridge and the approximately three-month closure of sections of East Levee Road along the NEMDC west levee, would interfere with emergency access to these residences and businesses (see also Section 4.2, "Land Use, Socioeconomics, and Population and Housing"). Because the Proposed Action could result in delays in emergency service response times, this impact is considered **potentially significant**.

REVISIONS TO SECTION 4.13, "AIR QUALITY"

PAGE 4.13-9

In response to Comment L1-1, the first bulleted item under "Construction in Sacramento County" on page 4.13-9 of the Phase 3 DEIS/DEIR (Mitigation Measure 4.13-a, "Implement Applicable District-Recommended Control Measures to Minimize Temporary Emissions of ROG, NO_X, and PM_{10} during Construction") is revised as follows:

Mitigation Measure 4.13-a: Implement Applicable District-Recommended Control Measures to Minimize Temporary Emissions of ROG, NO_X, and PM_{10} during Construction

- SAFCA shall submit a construction emissions dust control plan(s) to SMAQMD that reduces fugitive dust emissions by at least 85% (or shall provide calculations based on SMAQMD-approved methodologies showing that emissions would be reduced to less than 100 tons per year assuming a conservative reduction of 75% with typical mitigation) ~~and shall receive approval of the plan(s) (or revised calculations) before groundbreaking~~. All grading operations shall be suspended when fugitive dust levels exceed levels specified by SMAQMD rules. SAFCA and its primary construction contractors shall ensure that dust is not causing a nuisance beyond the property line of the construction site.

PAGE 4.13-11 AND 4.13-12

In response to Comments L1-3 and L1-4, the eighth and ninth bulleted items under "All Project Construction" for Mitigation Measure 4.13-a, "Implement Applicable District-Recommended Control Measures to Minimize Temporary Emissions of ROG, NO_X, and PM_{10} during Construction" on pages 4.13-11 and 4.13-12 of the Phase 3 DEIS/DEIR is revised as follows and one additional bulleted item is added:

- Idling time for all heavy-duty equipment shall be limited to ~~10~~5 minutes.

- ~~Diesel-fueled construction equipment that will operate on the project site for more than 40 hours shall be equipped with diesel particulate filters (DPFs) that meet ARB "Level 3" verification standards.~~ Install ARB-certified Level 3 diesel particulate filters (DPF) on a minimum of 15% of the total number of off-road (non-street legal) diesel-powered construction equipment pieces with an engine size equal to or greater than 50 horsepower (hp) throughout the duration of the project. For fleets with 6 or fewer total applicable equipment pieces, a DPF shall be installed on a minimum of one engine. All DPFs shall be kept in working order and maintained in operable condition according to manufacturer's specifications. ~~A list of currently verified DPF technologies~~At the time of this writing, a list of ARB-certified Level 3 diesel particulate filters (DPF) can be found at http://www.arb.ca.gov/diesel/verdev/level3/level3.htm.

- Install Level 3 ARB-certified DPF that are functional and kept in working order to meet manufacturer's specifications throughout the duration of the project on at least 15% of the total pieces of off-road (non-street legal) construction equipment on the project site over 50 horsepower (hp) (a minimum of one diesel particulate filter for fleets with 6 or less total pieces).

REVISIONS TO SECTION 4.15, "RECREATION"

PAGES 4.15-2 AND 4.15-3

In response to Comments O3-3 and O3-4, Mitigation Measure 4.15-a, "Prepare and Implement a Bicycle Detour Plan for the Ueda Trail, Provide Construction Period Information on Recreational Facility Closures and Detours, Provide Detours for Bicycle Facilities, and Coordinate with Recreation Agencies to Allow Them to Repair Damage to Recreational Facilities," on pages 4.15-2 and 4.15-3 of the Phase 3 DEIS/DEIR is revised as follows:

Mitigation Measure 4.15-a: Prepare and Implement a Bicycle Detour Plan for all bicycle trails and on-street bicycle routes, including the Ueda Parkway Trail and Garden Highway, Provide Construction Period Information on Recreational Facility Closures and Detours, Provide Detours for Bicycle Facilities, and Coordinate with Recreation Agencies to Allow Them to Repair Damage to Recreational Facilities

Proposed Action and Levee Raise-in-Place Alternative

SAFCA shall implement the following measures to reduce temporary, short-term construction impacts on recreational opportunities in the project area:

- Before the start of construction, prepare a bicycle detour plan for all bicycle paths and on-street bicycle routes, including the Ueda Parkway Bicycle Trail and Garden Highway, in consultation with the County and/or City of Sacramento Bicycle and Pedestrian Coordinator as applicable. The detour plan shall include posted signs clearly indicating closure points, detour routes, roadway markings to designate temporary bike lanes, and informational signs to notify motorists to share the roads with bicyclists. Signs shall be posted at major entry points for bicycle trails and routes to notify users of closure points and detours. The detour plan shall be in place before the start of construction and shall be maintained and implemented throughout the construction period.

- Provide construction period information on recreational facility closures and detours.

- Upon completion of the levee improvements, coordinate with the City and/or County (where applicable) for the City and/or County (where applicable) to restore access and repair any construction related damage to recreational facilities, including the Ueda Parkway bicycle trail.

Implementing this mitigation measure would reduce the temporary impact from construction-related disruption to bicycle trails and the boat launch facility under the Proposed Action and the Levee Raise-in-Place Alternative to a **less-than-significant** level because construction-related damage would be repaired, access restored, and detour routes, roadway markings to designate temporary bike lanes, and informational signs would be provided. ***(Similar)***

REVISIONS TO SECTION 4.17, "UTILITIES AND SERVICE SYSTEMS"

PAGE 4.17-4

In response to Comment L5-6, Mitigation Measure 4.17-b, "Verify Utility Locations, Coordinate with Utility Providers, Prepare and Implement a Response Plan, and Conduct Worker Training with Respect to Accidental Utility Damage," on page 4.17-4 of the Phase 3 DEIS/DEIR is revised as follows:

Mitigation Measure 4.17-b: Verify Utility Locations, Coordinate with Utility Providers, Prepare and Implement a Response Plan, and Conduct Worker Training with Respect to Accidental Utility Damage

Proposed Action and Levee Raise-in-Place Alternative

Before construction begins, SAFCA and its primary contractors shall coordinate with USACE, the CVFPB, and applicable utility providers to implement orderly relocation of utilities that need to be removed or relocated. Power pole relocations shall be coordinated with SMUD and SACDOT to avoid conflicts with the SACDOT-proposed bike/pedestrian path. Existing main electrical power transmission lines and poles on the water side of the existing Garden Highway levee that do not need to be relocated or replaced to accommodate the project may be left in place. No new main electrical power transmission lines and poles shall be installed on the water side of Garden Highway. Consistent with sound engineering practices that prioritize the following, individual service lines shall: (1) use existing configurations and

facilities, and (2) any new poles shall be placed on the land side of Garden Highway, subject to the approval of USACE, the CVFPB, and any other regulatory public agencies and utility companies.

Notification of any potential interruptions in service shall be provided to the appropriate agencies and affected landowners.

Before the start of construction, utility locations shall be verified through field surveys and the use of the Underground Service Alert services. Any buried utility lines shall be clearly marked in the area of construction on the construction specifications in advance of any earthmoving activities.

Before the start of construction, a response plan shall be prepared to address potential accidental damage to a utility line. The plan shall identify chain of command rules for notification of authorities and appropriate actions and responsibilities to ensure the safety of the public and workers. Worker education training in response to such situations shall be conducted by the contractor. The response plan shall be implemented by SAFCA and its contractors during construction activities.

Utility relocations shall be staged to minimize interruptions in service.

Additionally, upon borrow site selection within the Elkhorn Borrow Area, further verification of utility locations, coordination with utility providers, preparation and implementation of a response plan, and any required construction worker training with respect to accidental utility damage shall be completed before any earth-moving activities take place.

Implementing this mitigation measure would reduce the impact from disruption of utility services to a **less-than-significant** level because SAFCA would coordinate with utility service providers and consumers to minimize interruptions to the maximum extent feasible and a response plan to address service interruptions would be prepared and implemented. ***(Similar)***

4.5 REVISIONS TO CHAPTER 5.0, "CUMULATIVE AND GROWTH-INDUCING IMPACTS, AND OTHER STATUTORY REQUIREMENTS"

To reflect revisions in the report by Luhdorff & Scalmanini Consulting Engineers (**Appendix A** of the FEIR), the analysis of cumulative groundwater impacts is revised as follows:

- **Groundwater:** The evaluation of potential groundwater impacts prepared by Luhdorff & Scalmanini Consulting Engineers (LSCE) investigated the impacts of the Proposed Action, in combination with existing and projected land and water use changes in the Natomas Basin and on the Basin's groundwater budget (see **Appendix B2** for the full report). The impacts of the Proposed Action include reduction in irrigated lands covered by the footprint of the proposed levee improvements, increase in recharge from the proposed canal improvements, and changes in land use and irrigation practices following excavation of soil and reclamation of the potential borrow sites. Without the Proposed Action, the simulation results show a reduction in groundwater storage of 4,971 acre-feet per year (afy) in the Natomas Basin. With the Proposed Action, the decrease in groundwater storage would be slightly smaller (~~4,248~~ 3,376 afy). Subsurface outflow from the Natomas Basin to the east would decrease slightly (from 21,738 afy to ~~21,118~~ 20,731 afy) as a result of the Proposed Action. Overall, the Proposed Action would have a small positive impact on groundwater supplies in the Natomas

Basin and a small negative impact on groundwater east of the Natomas Basin based on existing conditions.

The results of the 2030 simulation without the Proposed Action show a positive change in groundwater storage in the Natomas Basin of 1,572 afy. With the Proposed Action, the results indicate that, on average, SAFCA's construction activities would have a positive effect on groundwater levels in the Natomas Basin, resulting in an additional increase in storage of 348 afy (to 1,920 afy). The proposed cutoff walls would cause a small increase in groundwater outflow (from 1,200 to ~~1,238~~ 1,216 afy). Overall, the cumulative impact of the Proposed Action on future groundwater conditions is predicted to be negligible. The cumulative contribution of the Levee Raise-in-Place Alternative to cumulative impacts on groundwater would be similar to that of the Proposed Action. Therefore, neither the Proposed Action nor the Levee Raise-in-Place Alternative would result in a cumulatively considerable contribution to a significant cumulative impact.

4.6 REVISIONS TO CHAPTER 8.0, "REFERENCES"

Based on clarifications made to Section 2.3.3.3, "Rice and Field Crop Preservation," and Impact 4.9-f, "Impacts on Swainson's Hawk and Other Special-Status Bird," (see above under "Revisions to Chapter 2.0, "Alternatives," and Revisions to Section 4.9, "Special-Status Terrestrial Species"), the following references are added:

Estep, J.A. 1984. Diurnal Raptor Eyrie Monitoring Program. California Department of Fish and Game, Nongame Wildlife Investigations. Project Report W-65-R-1, Job No. II-2.0. Sacramento, CA

Estep, J.A. 2008 (March). *The Distribution, Abundance, and Habitat Associations of the Swainson's Hawk (Buteo swainsoni) in Yolo County*. Prepared for Yolo Natural Heritage Program, Woodland, CA. Prepared by Estep Environmental Consulting. Sacramento, CA.

Woodbridge, B. 1998. Swainson's Hawk (*Buteo swainsoni).* In *The Riparian Bird Conservation Plan: A Strategy for Reversing the Decline of Riparian-Associated Birds in California. California Partners in Flight.* Available: http://www.prbo.org/calpif/htmldocs/species/riparian/swainsons_hawk.htm.

To correct a reference within Mitigation Measure 4.5, "Implement Standard Best Management Practices, Prepare and Implement a Stormwater Pollution Prevention Plan, and Comply with National Pollutant Discharge Elimination System Permit Conditions," (see above under "Revisions to Section 4.5, "Water Quality"), the following reference is added:

Lahontan Regional Water Quality Control Board. 2007 (December 14). *Truckee River Basin Stormwater Management Program, Program Year 2007-2012*. Prepared by Placer County Department of Public Works, Auburn, CA. Available: <http://www.placer.ca.gov/Departments/Works/~/media/dpw/npdes/documents/TruckeeRiverBasinSWMP.ashx>. Accessed April 2009.

Based on text additions made to Impact 4.6-a, "Loss of Fish or Aquatic Habitat through Increased Sedimentation and Turbidity or Releases of Contaminants," (see above under "Revisions to Section 4.6, "Fisheries"), the following reference is added:

Laughlin, J. 2005. *Effects of Pile Driving on Fish and Wildlife.* Presentation to National Academy of Sciences–Transportation Research Board.

4.7 REVISIONS TO APPENDIX H, "CONSTRUCTION DETAILS"

PAGE H-1 THROUGH H-3

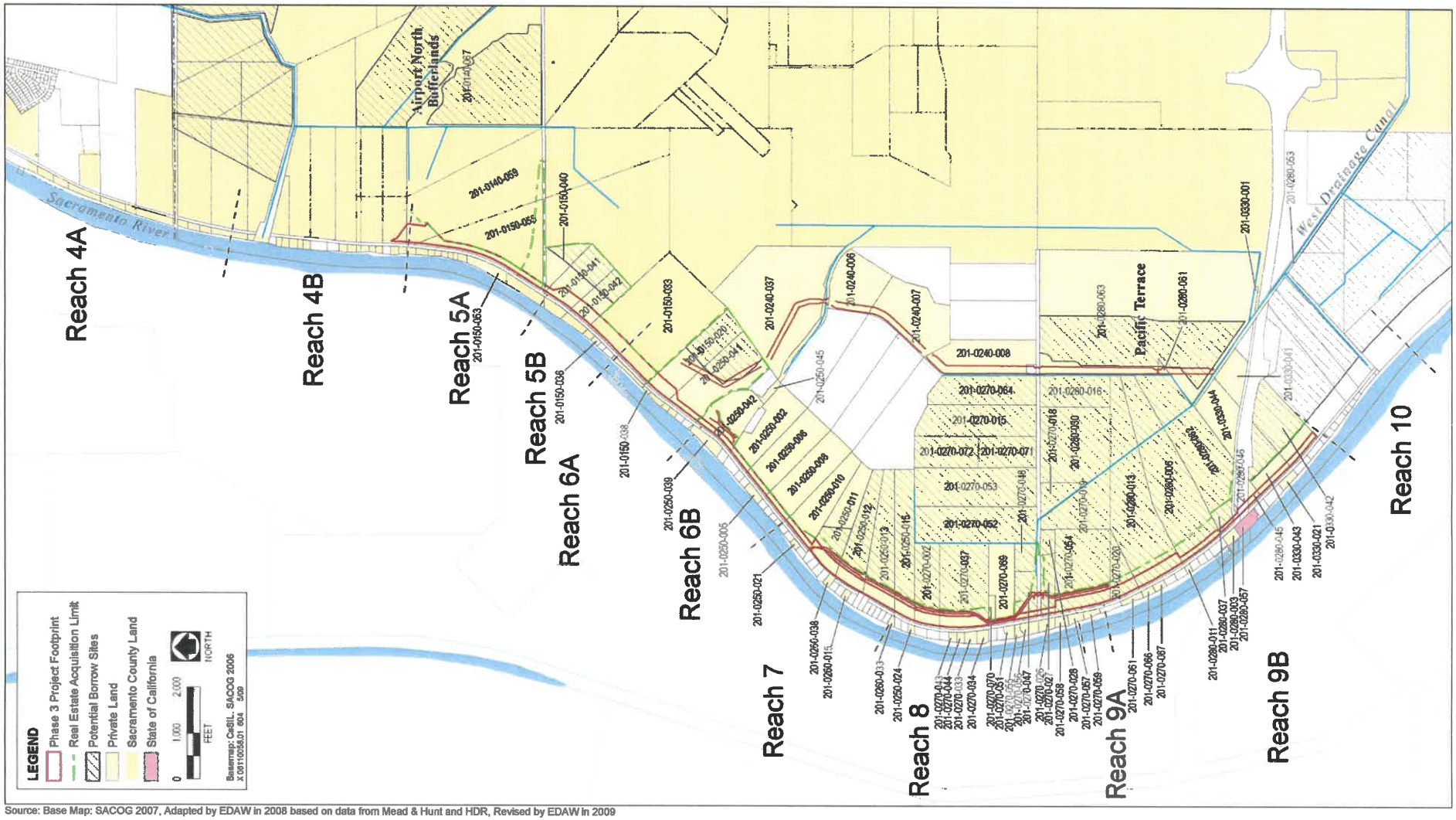
To provide clarification regarding which parcels are affected by proposed levee improvements along the Sacramento River east levee, APN 201-0270-0048 has been added to Table H-1:

Table H-1 Land Ownership by Parcel Number in the Phase 3 Project Footprint	
Drainage Outlets along the Sacramento River (Reaches 5A–9B)	
County of Sacramento	201-0150-036, 201-0150-038, 201-0150-053
Natomas Central Mutual Water Company	201-0250-039
Private Landowner	201-0250-005
Private Landowner	201-0250-021
Private Landowner	201-0250-024
Private Landowner	201-0260-015
Private Landowner	201-0270-026
Private Landowner	201-0270-033
Private Landowner	201-0270-061
Private Landowner	201-0280-003
Private Landowner	201-0280-011
GGS/Drainage Canal	
Citiland, Inc.	201-0240-006, 201-0240-007
Clinical Associates of Erie, Inc.	201-0330-035
Natomas Central Mutual Water Company	201-250-045
Pacific Terrace, LLC	201-0280-061, 201-0280-063
Reclamation District 1000	201-0280-053, 201-0330-001
Private Landowner	201-0150-020
Private Landowner	201-0240-008
Private Landowner	201-0240-037
Private Landowner	201-0250-041
Private Landowner	201-0330-041
Private Landowner	201-0330-044
Natomas East Main Drainage Canal	
Twin Rivers Unified School District	201-0320-018, 201-0320-019
Alice and Marie Krumenacher	201-0320-025
Private Landowner	201-0540-073
Private Landowner	214-0010-011
Private Landowner	226-0010-002
Private Landowner	226-0010-003
Private Landowner	226-0010-004
Private Landowner	226-0020-003
Private Landowner	226-0020-004
Private Landowner	226-0020-005
Pleasant Grove Creek Canal	
Brookfield	35-080-021
Private Landowner	35-080-022
Private Landowner	35-120-007
Private Landowner	35-150-005
Private Landowner	35-160-006
Private Landowner	35-160-038
Private Landowner	36-120-003
Sacramento River East Levee Reaches 4B–8 and/or Elkhorn Canal Relocation	
County of Sacramento	201-0140-059, 201-0150-033, 201-0150-055, 201-0280-046

Table H-1 Land Ownership by Parcel Number in the Phase 3 Project Footprint	
Natomas Center Mutual Water Company	201-0250-042
South Sutter, LLC	201-0250-015, 201-0270-037, 201-0270-037
Teal Bend, LP	201-0250-002, 201-0250-006, 201-0250-008, 201-0250-010
Private Landowner	201-0150-020
Private Landowner	201-0150-041
Private Landowner	201-0150-042
Private Landowner	201-0270-054
Private Landowner	201-0270-069
Private Landowner	201-0270-070
Private Landowner	201-0250-011
Private Landowner	201-0250-012
Private Landowner	201-0250-013
Private Landowner	201-0250-041
Private Landowner	201-0270-020
Private Landowner	201-0270-027
Private Landowner	201-0270-047
Private Landowner	201-0270-0048
Private Landowner	201-0150-040
Private Landowner	201-0280-006
Private Landowner	201-0280-013
Private Landowner	201-0280-062
Private Landowner	201-0330-045
Private Landowner	201-0330-043
Private Landowner	201-0330-042
Potential Borrow Sites	
Airport north bufferlands	201-0140-067, 201-0010-015, 201-0130-032, 201-0020-018
Brookfield	35-080-021
Dunmore	201-0120-031
Lower Woodland Corridor	201-0250-011, 201-0250-012, 201-0250-013, 201-0250-015, 201-0270-002, 201-0270-037, 201-0270-054, 201-0270-020, 201-0280-013
Krumenacher	201-0320-025, 201-0320-024
Pacific Terrace	201-0280-063
Private Landowner	201-0250-011, 201-0250-012, 201-0250-013
Private Landowner	201-0150-040, 201-0150-041, 201-0150-042
Private Landowner	201-0150-020, 201-0250-041
RD 1001	33-0280-025
South Sutter, LLC	201-0250-015, 201-0270-002, 201-0270-037
Sutter Pointe	35-0230-019, 35-0230-021, 35-0230-031, 35-0240-017, 35-0240-033
Twin Rivers Unified School District	201-0320-018, 201-0320-019
Notes: GGS = Giant Garter Snake; RD = Reclamation District Source: Data compiled by EDAW in 2008 from information provided by SAFCA	

PAGE H-7

To clarify which parcels would be subject to real estate acquisition under the proposed project, Exhibit H-1b has been revised to show a maximum real estate acquisition limit.



Source: Base Map: SACOG 2007, Adapted by EDAW in 2008 based on data from Mead & Hunt and HDR, Revised by EDAW in 2009

Land Ownership in the Phase 3 Project Footprint

Plate H-1b

PAGE H-20

To provide clarification regarding East Levee and Sorento Roads, the first paragraph of Section 4, "Natomas East Main Drainage Canal West Levee" on page H-20 of Appendix H, "Construction Details" to the Phase 3 DEIS/DEIR is revised as follows:

> A cutoff wall would be constructed along the levee to a depth of up to 80 feet from the levee crown along the NEMDC west levee between Elkhorn Boulevard and Northgate Boulevard. To provide a working platform, at a minimum, the gravel operating road surfacing would be removed and stockpiled for later reuse. East Levee Road and Ueda Bikeway asphalt pavement would be removed for construction of the cutoff wall. Depending on the equipment used to construct the wall, the levee may be degraded between 5–10 feet to provide additional working width. From the NEMDC Stormwater Pumping Station to Northgate Boulevard, approximately 21,000 linear feet of cutoff wall would be constructed up to a depth of 80 feet. East Levee Road, including the intersection with Sorento Road, would be closed for approximately three months during construction of the cutoff wall. Alternative neighborhood access would be provided for residents north of the NEMDC Pumping Station whose driveways connect to East Levee Road. Following completion of the cutoff wall, the levee crown would be reconstructed and the operating road surface restored to gravel roadway or asphalt pavement depending on the existing road surface. This operation is anticipated to require three headings working two back-to-back 12-hour shifts per day; 24-hours-per-day operation would be required to complete the cutoff wall before the flood season. A 6-day work week (Monday through Saturday) with maintenance on Sunday is expected, with a total of 75 working days to complete cutoff wall installation. If the cutoff wall is constructed with a CB mix, up to 167,000 cy of excess soil from the excavation of the trench would be used to construct the levee improvement between Elkhorn Boulevard and the NEMDC Stormwater Pump Station.

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In response to Comment Letter S5, the first bulleted item under Section 6.1, "Alignment," on page H-29 of Appendix H, "Construction Details," to the Phase 3 DEIS/DEIR is revised as follows:

> **Cross Section with Bench-Types A and B.** This typical cross section has a 10-foot bottom width and 3H:1V side slopes with managed water levels of 4.5 feet +/- 0.5 feet. In this reach, a bench (Type A = 15 feet wide; Type B = 50 feet wide) would be included on one side of the low-flow channel. The bench area would be planted with perennial grasses. ~~would have a maintained water depth of 3-12 inches. Tules would be planted on the sloped banks and bench and would typically be inundated with water during summer for enhancement of giant garter snake habitat.~~ Overbank areas would have the potential for flooding during 10-year or greater storm events. A 20-foot-wide operation and maintenance corridor would be constructed on each side of the canal.

PAGES H-29 THROUGH H-31

To provide clarification and additional detail regarding the Airport West Ditch, the following paragraph is added to the end of Section 7, "Airport West Ditch Reconfiguration," of Appendix H, "Construction Details," to the Phase 3 DEIR/DEIR:

> Modification of the Airport West Ditch would entail flattening the bank slopes along approximately 8,200 feet of the ditch, from the existing northern extent to the bend located near Meister Way. The banks would be flattened to 5H:1V, extending the width of the ditch from 35 to 105 feet-wide (top-of-bank to top-of-bank), and a 15 foot-wide operations and maintenance roadway would be constructed. The Airport West Ditch would remain 7 feet-deep, allowing for

continued drainage from Airport drainage pipes. Additionally, the proposed reconfiguration includes rerouting drainage from Jacob's Slough and the Reservoir Road Ditch to discharge into the new GGS/Drainage Canal instead of the Airport West Ditch. As a result, the only source of water entering the Airport West Ditch would come from the Airport drainage system.

PAGE H-32

To provide clarification and additional detail, the third paragraph on page H-32 under Section 8.1, "Layout," of Appendix H, "Construction Details," to the Phase 3 DEIR/DEIR is revised as follows:

> The replacement outfall structure would be constructed close to the location of the original Pumping Plant No. 2 outfall structure. The concrete outfall structure would have a footprint of approximately 21 by 21 feet. A sheet pile cofferdam would be utilized to isolate and dewater an area of approximately 23 by 23 feet for the instream construction area of outfall. Construction of the cofferdam and dewatering would occur during an in-water work window when sensitive fish species are least likely to be present (e.g., July 1–October 31). Further, a fish rescue plan would be developed and implemented during cofferdam construction and dewatering activities to avoid and/or minimize the potential disturbance and/or potential fish stranding.

PAGE H-35

To provide clarification and additional detail, Section 9, "Prichard and Elkhorn Pumping Plant Modifications," on page H-35 of Appendix H, "Construction Details," to the Phase 3 DEIR/DEIR is revised as follows:

> Because the Basin is surrounded by levees, all excess drainage within the Basin must be pumped out. In general, water is pumped into the Basin using NCMWC facilities and drainage within the Basin is pumped to the river via RD 1000's drainage system and pumping plants. Because the discharge pipes are required to cross the levee above the new "200-year" design flood elevation, the existing gate structure for the NCMWC Elkhorn Pumping Plant would need to be removed. The existing gate structure for the NCMWC Prichard Pumping Plant would also need to be removed. The existing pumps at both pumping plants would require modification or replacement to allow similar performance after the levee improvements and pipe raising. The superstructure at Prichard Pumping Plant would require retrofitting or other rehabilitation to accommodate the new pipes. Some localized dredging of sedimentation using hand pumps and divers within the Sacramento River may be required for installation of the new pumps. Any in-water work, including dredging in localized areas would be conducted during an in-water work window when sensitive fish species are least likely to be present (e.g., July 1–October 31). For removal of the manifold structure, the pump house, the gate structures, use of a backhoe, pneumatic hammers, and a front-end loader and haul truck would likely be required. The material would be wasted and removed from the site or salvaged and returned to NCMWC. For modifications to the pumps, the pumps would be pulled from the pump platform and replaced with new pumps.
>
> As discussed in Chapter 5.0, "Cumulative and Growth-Inducing Impacts, and Other Statutory Requirements," the demolition of the Prichard and Elkhorn Pumping Plants and the removal of the intake pipes are part of the American Basin Fish Screen and Habitat Improvement Project (ABFS), which would include a replacement pumping facility on the Sacramento River, near the existing plant locations. The timing and extent of construction at these sites under the NLIP depend on the following two scenarios:
>
> - If construction of the ABFS is completed first, the demolition of the plants would be completed and the pipes through the levee would be removed.

- If the ABFS is not completed first, the cutoff wall would be installed along the Sacramento River east levee and the pipes would be raised and the pumps and motors modified so that that these plants could continue to operate. After the ABFS is constructed and operational, the pipes and pumps would be removed.

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APPENDIX A

Groundwater Impact Analysis

(updated from the 11/14/08 version included in the Phase 3 DEIS/DEIR)

Evaluation of Potential Groundwater Impacts Due to Proposed Construction for Natomas Levee Improvement Program

prepared for:

Sacramento Area Flood Control Agency
(SAFCA)

prepared by:

Luhdorff & Scalmanini,
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May 4, 2009

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Acronyms and Abbreviations

AFB	Air Force Base
af	acre-feet
af/ac/yr	acre-feet per acre per year
af/ft^2	acre-feet per square foot
afy	acre-feet per year
CVIGSM	Central Valley Integrated Groundwater and Surface Water Model
DWR	California Department of Water Resources
EIR	Environmental Impact Report
EIS	Environmental Impact Statement
ET	evapotranspiration
FAA	Federal Aviation Agency
ft	feet
ft/day	feet per day
ft/ft	feet per foot
GGS	giant garter snake
GPS	Global Positioning System
HEC	Hydrologic Engineering Center
HDR	HDR Engineering, Inc.
IGSM	Integrated Groundwater and Surface Water Model
lf	linear feet
LSCE	Luhdorff & Scalmanini, Consulting Engineers
M&H	Mead & Hunt
M&I	municipal and industrial
MBK	MBK Engineers
msl	mean sea level (based on NAVD88)
MW	Montgomery Watson
MWH	Montgomery Watson Harza
NARIGSM	North American River Integrated Groundwater and Surface Water Model
NAVD	North American Vertical Datum
NBC	Natomas Basin Conservancy
NBHCP	Natomas Basin Habitat Conservation Plan
NCC	Natomas Cross Canal
NCMWC	Natomas Central Mutual Water Company
NEMDC	Natomas East Main Drainage Canal
NGVD	National Geodetic Vertical Datum
NLIP	Natomas Levee Improvement Project
pers. comm.	personal communication
PGCC	Pleasant Grove Creek Canal
RD 1000	Reclamation District No. 1000
SACIGSM	Sacramento County Integrated Groundwater and Surface Water Model
SAFCA	Sacramento Area Flood Control Agency

Acronyms and Abbreviations (continued)

SCS	Soil Conservation Service
SIA	Sacramento International Airport
URS	URS Corporation
USACE	U.S. Army Corp of Engineers
VVA	Valley View Acres
WRIME	Water Resources & Information Management Engineering

1.0 Introduction

The Sacramento Area Flood Control Agency (SAFCA) requested that Luhdorff and Scalmanini, Consulting Engineers (LSCE) conduct an investigation of the potential groundwater impacts of levee improvements proposed by SAFCA along portions of the levees surrounding the Natomas Basin. These include the Sacramento River East Levee, the Natomas Cross Canal (NCC) South Levee, the Pleasant Grove Creek Canal (PGCC) West Levee, the Natomas East Main Drainage Canal (NEMDC) and Steelhead Creek West Levee, and the American River North Levee. Most of the proposed levee improvements will have no effect on groundwater, but there are potential effects due to land use changes, slurry cutoff walls, new or relocated canals, and borrow site excavation. LSCE (2008a) prepared a preliminary evaluation on the effects of proposed Sacramento River East Levee slurry cutoff walls in a previous report entitled *Evaluation of Potential Groundwater Impacts Due to Proposed Sacramento River East Levee Improvements with Emphasis on Reaches 2 and 3*. The information in this report updates and supercedes the contents of the previous report.

This report includes detailed water budgets prepared for the Natomas Basin to evaluate the groundwater impacts of all proposed SAFCA construction activities. The water budgets are partially based on the results of two existing numerical groundwater flow models that together simulate the North and South American Subbasins (including the Natomas Basin) in Sutter, Placer, and Sacramento Counties. Water Resources and Information Management Engineering, Inc. (WRIME) updated these models in 2007-2008 to better reflect existing and predicted future land and water use in the Natomas Basin. Some of the groundwater budget results summarized below are based on the 2030 simulations, which are summarized in LSCE (2008b). A groundwater budget for proposed SAFCA construction activities was calculated separately and was used to evaluate the cumulative impacts of these activities on existing and future groundwater conditions in the Natomas Basin and the North American Subbasin.

1.1 Report Revisions

This is a revised version of the report submitted to SAFCA on November 14, 2008. Revisions to this and other reports prepared for the Natomas Levee Improvement Project (NLIP) Phase 3 Project Environmental Impact Report (EIR)/Environmental Impact Statement (EIS) were necessary due to a requirement by the U.S. Army Corps of Engineers (USACE) that all elevations be converted from the NGVD 1929 vertical datum to the NAVD 1988 vertical datum. Revisions based on the datum change were made to one table and 13 figures in the report.

Other changes to the report were made to reflect updated plans for slurry cutoff walls surrounding the Natomas Basin. As of April 2009, planned mitigation for levee seepage calls for additional cutoff walls along a number of reaches the Sacramento River East Levee, the PGCC West Levee, the NEMDC West Levee, and the American River North Levee. However, many of these planned cutoff walls are shallower than those previously proposed.

Changes to the analysis of potential slurry cutoff wall impacts were also necessitated by recent revisions to a groundwater flow model prepared by Kleinfelder, Inc. (Kleinfelder) to estimate seepage beneath the Sacramento River East Levee with and without slurry cutoff walls. That analysis was originally summarized in a report entitled *Evaluation of Cutoff Walls Impact on Groundwater Recharge, Sacramento River East Levee, Natomas Levee Improvement Project, Sacramento and Sutter Counties, California*. (Kleinfelder, December 19, 2007). The revised report is dated April 21, 2009. The analysis of the potential groundwater impacts of slurry cutoff walls in this report is partially based on results of the 2009 Kleinfelder model.

1.2 Project Description

The analysis of groundwater impacts in this report relies on project descriptions for proposed SAFCA construction activities obtained from a variety of sources. These include the Draft and Final EIR for the NLIP prepared by EDAW (2007a and 2007b) and the Draft EIS prepared by USACE (2008). Design and engineering work for most of these projects is still in progress, so assumptions were made about the most likely configuration of each project. In cases where even preliminary project descriptions were not available, a conservative option was selected for analysis. Assumptions about many of these projects were provided primarily via personal communications (pers. comm.) with David Rader of EDAW and Marieke Armstrong of Mead & Hunt (M&H). Other information was provided by Wood Rodgers and the engineering team at Kleinfelder.

1.2.1 Levee Improvements

Groundwater impacts from proposed levee improvements are primarily limited to the potential effects of land use changes and slurry cutoff walls. Slurry cutoff walls and seepage berms are proposed mitigation measures to reduce problems of excess seepage beneath the levees, but no direct groundwater impacts are expected from seepage berms because they would be above the water table. The slurry cutoff walls are intended to reduce seepage beneath the levees, and impacts resulting from this reduction are addressed in this report. The location of the five levees discussed below are shown in **Figure 1-1**. A total of about 29 miles of slurry cutoff walls is currently proposed.

Sacramento River East Levee – Levee improvements will require land use changes, including removal of 20 acres of rice, 175 acres of field crops, and five acres of orchard. Slurry cutoff walls are proposed for 12 reaches (total of 10.1 miles) of the 18.1 mile length of the East Levee. These cutoff walls will range in depth from about 14 to 115 feet, with an average depth of about 65 feet.

Natomas Cross Canal South Levee – Proposed land use changes along the NCC South Levee will require removal of about five acres of rice fields. Slurry cutoff walls are being constructed for the entire length (about 5.4 miles) of the NCC. These cutoff walls are projected to be about 70 feet deep. Approximately 5,400 lineal feet (lf) of cutoff wall was installed in 2007, and another 3,600 lf was planned to be installed in 2008.

Pleasant Grove Creek Canal West Levee – The PGCC West Levee is about 3.3 miles long, and slurry cutoff walls ranging in depth from 20 to 50 feet are currently proposed for about

14,000 lf of the levee. Proposed land use changes along the PGCC West Levee would require removal of about 50 acres of rice fields.

Natomas East Main Drainage Canal West Levee – The NEMDC and Steelhead Creek West Levee is about 13.3 miles long. Improvements to the NEMDC West Levee are in the early planning stages, but slurry cutoff walls are being considered for about 8.7 miles of the levee. The estimated depths of these cutoff walls are range from 30 to 45 feet for the North NEMDC and 30 to 53 feet for the South NEMDC. Land use changes due to NEMDC levee improvements have not been evaluated, but irrigated agriculture is limited to the northern portion of the levee and effects are expected to be minimal.

American River North Levee – The American River North Levee is about 2.2 miles long in the Natomas Basin. Plans for improvements to this levee are in the very early planning stages, but slurry cutoff walls are under consideration for the entire length of the levee. Proposed cutoff walls would have an estimated depths of approximately 35 feet for Reaches 1 and 2 and 80 feet for Reaches 3 and 4. There is no irrigated agriculture in this area to be affected by levee improvements.

1.2.2 Canal Improvements

SAFCA is planning to construct one new canal in the Natomas Basin and relocate or improve three existing canals. This construction will necessitate land use changes, including the loss of irrigated agricultural land. Although seepage from existing canals has not been quantified, it is considered to be a significant contributor to groundwater recharge in the Natomas Basin. The new and relocated canals will be unlined and will result in an overall increase in the rate of canal seepage. The proposed locations of new and existing canals discussed below are shown on **Figure 1-1**.

Giant Garter Snake/Drainage Canal – SAFCA plans to construct a new Giant Garter Snake (GGS) and Drainage Canal east and roughly parallel to the Sacramento River East Levee. The GGS/Drainage Canal will be about 4.4 miles long and 50 feet wide at the waterline, and will be unlined. A total of 45 acres of the land where the GGS/Drainage Canal will be constructed is currently planted to field crops.

West Drainage Canal – The GGS/Drainage Canal begins at the terminus of the West Drainage Canal. A number of improvements to the West Drainage Canal are planned, including rerouting of about 4,700 lf of the existing canal. The overall length of the canal will increase from about 3.6 to 3.9 miles, and the average width at the waterline will increase from 30 to 72 feet.

Elkhorn Canal – The Elkhorn Canal, which is located east of the Sacramento River East Levee and northwest of the Sacramento International Airport (SIA), is about 3.8 miles long and 16 feet wide. SAFCA plans to relocate this canal to make room for levee improvements. The relocated canal will be about 4.2 miles long and 32 feet wide. Approximately one mile of the existing Elkhorn Canal is lined with concrete, and about 6,000 lf of the relocated canal is proposed to be lined. In addition, two sections of the relocated canal (total of about 3,950 lf), primarily through the Teal Bend Golf Course, would be piped.

Riverside Canal – This canal, which is located east of the Sacramento River East Levee in the southwestern corner of the Natomas Basin is about 3.7 miles long and seven feet wide. SAFCA plans to relocate the Riverside Canal to accommodate levee construction, and the new canal would be about 3.9 miles long and ten feet wide.

1.2.3 Borrow Sites

SAFCA will require several borrow sites in the Natomas Basin to obtain sufficient soil for the proposed levee and canal improvements. The locations of these borrow sites are shown on **Figure 1-1**.

Airport North Bufferlands – The Airport North Bufferlands borrow site consists of 737 acres owned by the SIA and located north of the airport. Approximately 630 acres of this site that had previously been planted to rice have recently been removed from rice cultivation or other land uses that would attract water fowl at the request of the Federal Aviation Agency (FAA) and is currently fallow. SAFCA plans to remove about four to six feet of borrow material and restore the site to non-irrigated grassland.

Brookfield Property – The Brookfield property consists of 353 acres at the northern tip of the Natomas Basin. Approximately 325 acres of this property is currently planted to rice, and SAFCA plans to restore it to rice cultivation after removing the borrow material. The current crop mix is about 50% regular rice and 50% wild rice (Jack DeWit, pers. comm., July 8, 2008). Up to six feet of soil will be excavated, including one foot of topsoil that will be stockpiled and replaced after borrow operations are complete. The property is currently irrigated with groundwater, but SAFCA plans to provide the infrastructure so that most of the property can be irrigated with surface water after removal of borrow material. Engineering work is still in progress, but SAFCA estimates that about 80 percent of the property would be irrigated with surface water in the future after reclamation is complete.

Fisherman's Lake – The Fisherman's Lake borrow site is located at the northern end of the existing Fisherman's Lake in the southwestern portion of the Natomas Basin. Engineering work has not been completed for this site, but SAFCA estimates that about 100 acres of land currently planted to rice would be used for borrow material and would be restored to managed marsh.

1.3 Potential Impacts

The purpose of this report is to evaluate the potential groundwater impacts of SAFCA's proposed construction activities. These potential impacts can be grouped into three general categories:

1) Changes in groundwater recharge. These will occur due to land use changes and canal improvements. Specifically, the conversion of land from irrigated to non-irrigated land uses will reduce groundwater recharge, and canal construction and widening will increase groundwater recharge.
2) Changes in groundwater flow. Groundwater flow beneath the levees surrounding the Natomas Basin will be reduced due to the proposed slurry cutoff walls. Reductions in groundwater flow will generally be in the form of:
    a) Reduced groundwater recharge from the Sacramento and American Rivers;
    b) Reduced subsurface inflow from the north beneath the NCC; or

c) Reduced subsurface outflow to the east beneath the PGCC and NEMDC.

3) Changes in groundwater pumping.

Other potential groundwater impacts include:

- Groundwater quality degradation in the Natomas Basin due to reduced inflow of good quality recharge from the River and reduced groundwater outflow; and
- Impacts to the yield of wells located along levees where the cutoff walls would be constructed.

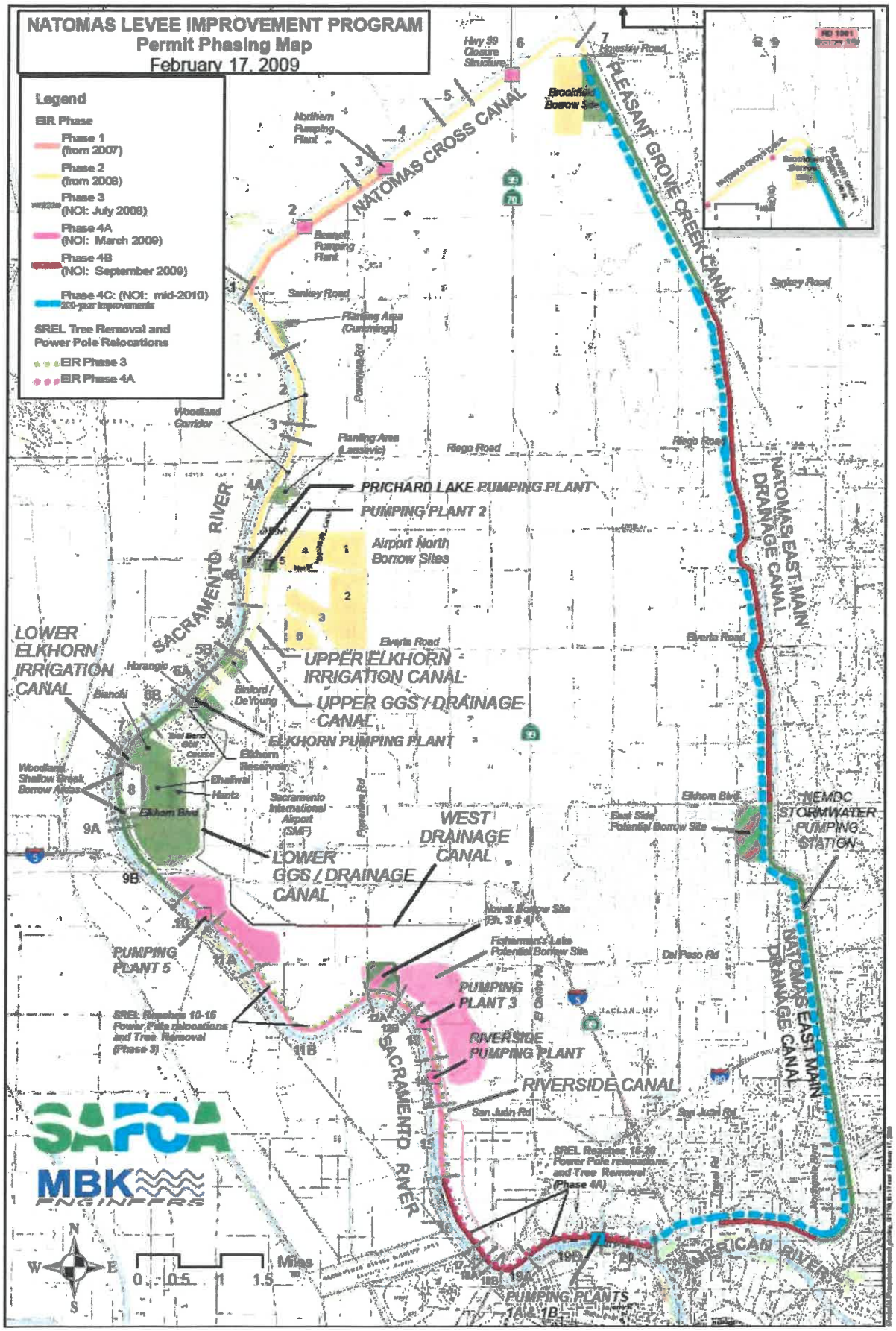

Figure 1-1
Proposed SAFCA Construction Locations for Natomas Levee Improvement Program

2.0 Hydrogeologic Conditions

2.1 Land Use and Water Supply

The Natomas Basin was used as the primary study area for the water budgets discussed below. As shown on **Figure 1-1**, the Natomas Basin is located on the east side of the Sacramento River, between the rural community of Pleasant Grove and the City of Sacramento, in Sutter and Sacramento counties. It consists of about 54,400 acres of agricultural and urban land surrounded by the Sacramento River on the west, the NCC on the north, the PGCC and the NEMDC on the east, and the American River on the south. Except for the SIA and the Teal Bend Golf Course, urban development in the area is primarily limited to the southeast corner of the Natomas Basin at present. This is expected to change in the future as several large developments are in the planning stages.

The Natomas Basin is surrounded by 42 miles of levees, which are maintained by Reclamation District No. 1000 (RD 1000). RD 1000 also operates and maintains a large drainage system within its boundaries to recirculate or dispose of agricultural and urban runoff. This system includes seven large pumping plants and 180 miles of canals and ditches.

Land use in the Natomas Basin is primarily agricultural, with rice being the primary crop. Approximately 28,700 acres were irrigated in 2004, and rice accounted for about 79 percent of the total. Other crops include alfalfa, clover, and oat hay; tomatoes and sugar beets; and crops such as wheat and safflower that are rotated with rice and tomatoes. Most of the agricultural land is irrigated by surface water diverted from the Sacramento River by Natomas Central Mutual Water Company (NCMWC). Much of the information provided below is based on the NCMWC Draft Groundwater Management Plan (2002) and the Integrated Water Resources Management Plan (American States Water Company, et al., 2006).

NCMWC operates three primary river diversions on the Sacramento River. Water is also diverted at two locations from the NCC. Water diverted from the NCC flows from north to south, while water diverted from the River flows generally from west to east, then south. NCMWC's surface water diversions average about 100,000 acre-feet per year (afy). This includes an estimated 10,000 afy diverted during the fall and winter to reflood fields for rice straw decomposition.

NCMWC completed the installation of a tailwater recirculation system in 1986 so that drainage water can be reused during the irrigation season to improve Sacramento River water quality, reduce river diversions, and increase overall efficiency. The recirculation system recaptures tailwater for re-use either directly to fields or back into the main irrigation canals. In recent years, NCMWC has relied heavily on recycled tailwater to supplement its Sacramento River entitlement. Tailwater is recycled partly because it cannot be discharged back to the Sacramento River due to water quality regulations. During a normal irrigation season, all agricultural drainage water is recirculated during the rice growing season, which typically ends in August.

The NCMWC Draft Groundwater Management Plan contains an estimate of 30,000 afy of recycled tailwater (NCMWC, 2002).

Approximately 3,300 acres of agricultural land are irrigated primarily with groundwater. This includes the entire northeastern portion of the Natomas Basin, which is not served by the existing NCMWC surface water distribution systems. The total groundwater pumpage in the Natomas Basin was estimated to be about 24,500 af in 2004 (LSCE, 2008b). Most of this was agricultural pumpage and included about 18,500 af in Sutter County and 6,000 af in Sacramento County.

The Natomas Basin Conservancy (NBC) currently owns over 4,000 acres of land in the Natomas Basin. The NBC began land acquisitions after completion of the Natomas Basin Habitat Conservation Plan (NBHCP) by the U.S. Fish and Wildlife Service and the California Department of Fish and Game in 1997. The NBHCP specified that lands be acquired for habitat conservation as mitigation for the effects of urban development in the Natomas Basin on endangered species and other wildlife. Under the terms of the NBHCP, NBC will ultimately acquire about 8,750 acres of land to mitigate the loss of approximately 17,500 acres slated for development. Most of the NBC mitigation lands have historically been planted to rice, and NBC plans to keep 50 percent of the lands in rice production and convert 25 percent to managed marsh and another 25 percent to upland habitat. As of 2004, approximately 475 acres had been converted to managed marsh.

Irrigated acreage within the Natomas Basin has decreased in recent years as more land has been converted to urban uses. Land use estimates indicate that the acreage irrigated with surface water decreased by about 4.7 percent per year between 1996 and 2006 (American States Water Company, et al., 2006). NCMWC land use data indicate that the amount of irrigated shareholder lands decreased by about 5.2 percent per year between 2004 and 2007.

2.2 Groundwater Basin and Subbasin Description

The Natomas Basin does not represent a groundwater basin or subbasin as defined by the California Department of Water Resources (DWR). It is located within the North American Subbasin, which is part of the Sacramento Valley Groundwater Basin. The North American Subbasin is located along the eastern edge of the Sacramento River Valley and encompasses about 351,000 acres in Sutter, Placer, and Sacramento counties. The North American Subbasin is bounded by the Bear River on the north, the Feather and Sacramento Rivers on the west, the American River on the south, and the approximate edge of the alluvial aquifer in the Sierra Nevada foothills on the east. The North American Subbasin and adjacent groundwater subbasins are shown on **Figure 2-1**.

2.3 Geology of the Natomas Basin

Prior to development, groundwater in the northern portion of the North American Subbasin flowed to the west and southwest from the Sierra Nevada toward the Feather and Sacramento Rivers. Most wells in the subbasin pump groundwater from either the volcanic Mehrten Formation or the overlying alluvial deposits, which have a westerly dip toward the axis of the valley. The following summary of geologic conditions in the Natomas Basin is based primarily

on the *Feasibility Report, American Basin Conjunctive Use Project* (DWR, 1997). This summary focuses on the shallow aquifers that could potentially be impacted by the proposed slurry cutoff walls.

The thickness of the fresh water-bearing deposits in the Natomas Basin increases from about 1,100 feet in the northeast to over 2,000 feet in the southwest. These deposits can be divided into upper and lower aquifer systems. The division between the two aquifer systems is inexact due to data limitations and the difficulty in accurately determining formation contacts. DWR (1997) indicates that the upper aquifer system consists of saturated Laguna Formation and younger sediments that collectively extend to a depth of 200 to 300 feet. For purposes of this study, the upper zone is defined as the upper 300 feet of the aquifer system, and the lower zone is assumed to extend from a depth of 300 feet to the base of fresh water.

The upper aquifer system in the Natomas Basin generally appears to be unconfined or semi-confined due to the presence of clay and silt confining layers within and underlying the upper zone. Sands and gravels in the upper zone are generally thin and laterally discontinuous, and there are thick sequences of fine-grained strata between the more permeable aquifer materials.

The youngest geologic units in the Natomas Basin are flood basin deposits and alluvium. Laterally extensive exposures generally occur along the western margin, adjacent to and within the active channels of the Sacramento River. The flood basin deposits are predominantly fine-grained sediments that have accumulated in flood basins along the major rivers of the Sacramento Valley. The flood basin deposits consist primarily of silt and clay, which yield little water to wells. The flood basin deposits also contain local lenses of sand and gravel deposited by the migrating ancestral river channels. These lenses have high permeabilities and can yield large quantities of groundwater to wells. The thickness of the flood basin deposits in the subbasin ranges up to 100 feet (Olmstead and Davis, 1961).

The alluvium consists primarily of sand, gravel, and silt, with minor amounts of clay, deposited in Recent geologic time (last 10,000 years) by the Sacramento River. Although the alluvium is highly permeable, it is too thin to represent a significant groundwater source. Most high-yield wells completed in the recent alluvium also draw groundwater from underlying formations.

Underlying the alluvium, the Riverbank and Modesto formations of Pleistocene age consist of a heterogeneous mixture of silt, sand, gravel, and clay. The units exhibit large variability in grain size over short distances, both laterally and vertically. The maximum combined thickness of the two units is 50 to 75 feet in the subbasin. On average, these units have moderate permeability but contain some coarser zones with high permeability (Olmstead and Davis, 1961).

The Laguna Formation of Pliocene age and the Turlock Lake Formation of early Pleistocene-age underlie the Riverbank and Modesto formations. Both formations consist primarily of a heterogeneous mixture of interbedded silt, clay, and sand. They contain a few gravel lenses, which are poorly sorted and have relatively low permeability. In general, these two formations are more fine-grained than overlying units, although it is difficult to determine subsurface contacts from drillers' logs. Wells completed in clean Laguna Formation sands and gravels can

produce significant quantities of groundwater. The combined thickness of the two units in the subbasin is probably less than 200 feet.

The lower aquifer system consists of non-marine, Mehrten Formation deposits and includes a smaller percentage of coarse-grained sediments. However, individual coarse-grained zones in the lower aquifer are typically thicker than in the upper aquifer. In some areas, the lower aquifer is further divided into two distinct units. The upper unit is comprised of gray to black andesitic sand and associated lenses of stream gravel containing andesitic cobbles and boulders interbedded with thicker blue or brown clay. The lower unit has been described as a dense, hard, gray tuff breccia. It is composed of angular pieces and blocks of andesite in a cemented matrix of andesite, devitrified lapilli, and ash derived from volcanic eruptions in the Sierra Nevada. Based on information from DWR monitoring wells, the Mehrten Formation is at least 900 feet thick near the Sacramento Airport, and the typical lower unit gray tuff does not occur at that location. The lower zone exhibits more confinement than the upper zone but is still considered to be semi-confined. There is a delayed response to imposed stresses in the upper aquifer, indicating hydraulic interconnection between these water-bearing strata.

2.4 Aquifer Hydraulic Conductivity

The ability of an aquifer to transmit water is measured by its hydraulic conductivity (which is closely related to permeability) and saturated thickness; the product of these two parameters is commonly known as aquifer transmissivity. The hydraulic conductivity of alluvial aquifer materials varies over many orders of magnitude, with fine-grained materials (clay and silt) at the bottom of the range and coarse-grained materials (sand and gravel) at the top. Most groundwater flow occurs through sand units, which are much more common in the subsurface than gravels. The hydraulic conductivity of sands is highly variable, depending on grain size, sorting, and cementation.

Long-term, constant-rate pumping tests are the preferred method for estimating hydraulic conductivity and other aquifer properties. Other field methods include short-term pumping tests and slug tests. If borehole logs are available, equations that estimate hydraulic conductivity based on grain-size distribution can be used in the absence of test data. The most common of these is the Kozeny-Carman equation (Kozeny, 1927 and Carman, 1937 and 1956) which has been used by Kleinfelder and URS Corporation (URS) to estimate the hydraulic conductivity of geologic materials beneath the east levee.

As further discussed below, the hydraulic conductivity of sand units underlying the levees is a primary input and the source of greatest uncertainty for models used to estimate seepage beneath the levees. A summary of hydraulic conductivity estimates for the Natomas Basin is provided in **Table 2-1**. The estimates vary by more than an order of magnitude, from 14 to 488 feet per day (ft/day), with a mean of 116 ft/day and a median of 51 ft/day. Values at the low end of the range were estimated by Kleinfelder using the Kozeny-Carman equation, and the highest value was estimated from a short-term pumping test. LSCE estimated a hydraulic conductivity of 36 ft/day based on an aquifer test conducted in the Paulson well in southern Sutter County (LSCE, 2008b).

Groundwater flow models that encompass the North American Subbasin also have relatively high hydraulic conductivities in the Natomas Basin. Hydraulic conductivity estimates used in

numerical groundwater flow models are typically adjusted during the calibration process. A groundwater flow model of the Sacramento Valley developed by DWR (1978) used hydraulic conductivity estimates of 51 to 139 ft/day for the upper layer of the model in the Natomas Basin. The groundwater models discussed in Chapter 4 have hydraulic conductivities in the upper layer ranging from 33 to 118 ft/day in the Natomas Basin.

Table 2-1
Hydraulic Conductivity Estimates in Natomas Basin

Estimated By	Location	Hydraulic Conductivity (ft/day)	Material Type	Source
Kleinfelder (2007)[1]	-	14	Sand with 3-7% silt	Kozeny-Carman equation
	-	28	Sand with 0-2% silt	Kozeny-Carman equation
URS (2007)[2]	STA 217+00	56	Sand to silty-sand	Kozeny-Carman equation
		283	Gravel	Kozeny-Carman equation
LSCE	Bianchi Wells 1 and 2	33-49	Sand to silty-sand	Estimated from specific capacity
	Lennar Westlake Well 1	488	Fine to coarse sand with gravel	2-hour pump test (11/21/00) in well perforated 112-132 ft.
	Lennar Paulson Well	36	Sand to silty-sand	36-hour pump test (7/3/07) in well perforated 185-397 ft.
DWR (1978)[3]	Node 37 (Sutter County)	51	Mixed	Sacramento Valley groundwater flow model
	Node 43 (Sacramento County)	139	Mixed	Sacramento Valley groundwater flow model
WRIME	Sutter County portion of Natomas Basin	86-118	Mixed	Layer 1 of North American River IGSM model
	Sacramento County portion of Natomas Basin	33-53	Mixed	Layer 1 of Sacramento County IGSM model
Average		**116**		
Median		**51**		

1. Kleinfelder, Inc. 2007. Basis of Design Report, Sacramento River East Levee Reaches 1 Through 4B (Draft)
2. URS Corporation, 2007. Preliminary Geotechnical Reevaluation Report, Sacramento River East Levee (Draft)
3. DWR. 1978. Evaluation of Groundwater Resources: Sacramento Valley

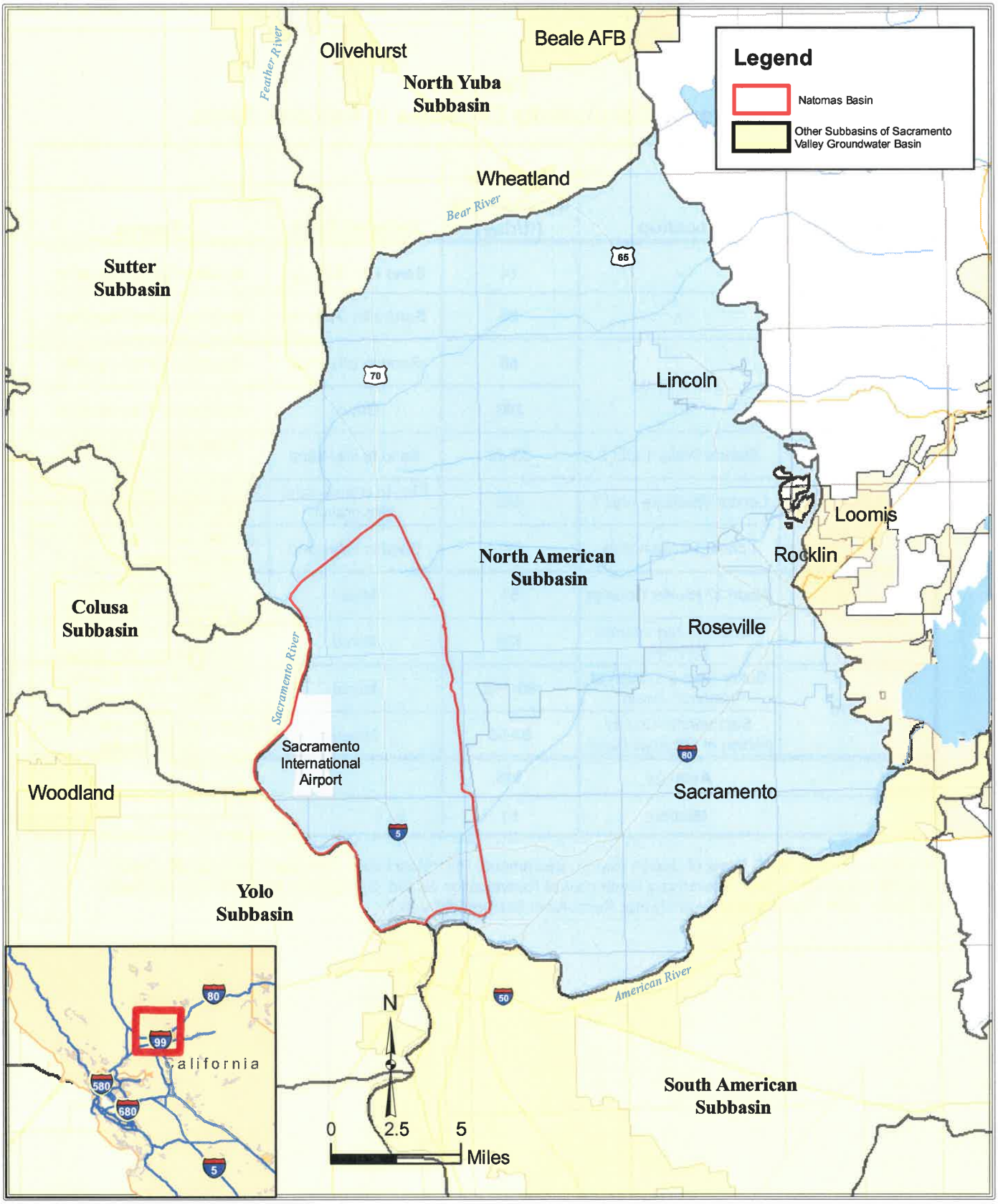

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Figure 2-1
Location of North American Subbasin and Adjoining Subbasins of the Sacramento Valley Groundwater Basin

3.0 Groundwater Levels and Flow

3.1 Sacramento River East Levee Piezometers

DWR has conducted groundwater level monitoring at a number of wells in the Natomas Basin since 1948. DWR monitored approximately 20 wells in 2003 but only 7 wells in 2007. In addition to the wells monitored by DWR, a series of shallow piezometers was constructed along the Sacramento River East Levee in the Natomas Basin to collect groundwater level data for previous investigations of seepage beneath the levee. A total of 38 piezometers has been installed along the levee since 1991, and at least some groundwater level data are available for 27 of these. Groundwater elevations measured in these piezometers have been plotted in order to determine the location and seasonal fluctuations of gaining and losing reaches along the Sacramento River East Levee. The 27 piezometers with water level data include four installed by Kleinfelder in 1998, 13 installed by USACE in 2001, and ten installed by Kleinfelder in 2004. The construction of the piezometers is summarized in **Table 3-1**, and the piezometer locations are shown on **Figure 3-1**. The piezometers range in depth from 12 to 90 feet, but most are between 25 and 50 feet deep. Many of the piezometers are paired based either on depth (shallow vs. deep) or location (closer to the River vs. further away). The latter pairings are particularly useful to show the direction and magnitude of the hydraulic gradient near the River.

Water level measurements at the piezometers have been intermittent, resulting in varying periods of record for water level data between 1999 and 2007. Data from the USACE piezometers are the most useful because the wellhead elevations have been surveyed and manual water level measurements are available. The USACE piezometers have a period of record from January 2002 to October 2003.

The Kleinfelder piezometers were not surveyed at the time of installation, and those installed in 1998 have a short period of record (December 2005 to April 2006). The piezometers installed by Kleinfelder in 2001 have a longer period of record (October 2004 to July 2006). There are no manual measurements available for these piezometers, however, and some of the transducer data are questionable as discussed below. The Kleinfelder piezometers were surveyed by LSCE on February 28 and 29, 2008 using survey-grade Global Positioning System (GPS) equipment with a vertical accuracy of at least one inch. The survey results are shown in **Table 3-1**. No bollards were installed to protect these piezometers, and two of them (PZ-4 and PZ-7) had been destroyed (apparently by farm equipment) by the time of the survey.

Data from the shallow levee piezometers were combined with other water level data to prepare contour maps of equal groundwater elevation for the North American Subbasin and more detailed maps for the Natomas Basin. The contour maps were prepared prior to the GPS survey of the Kleinfelder piezometers; therefore, data from these piezometers were not used to create the contour maps. Hydrographs were also prepared showing groundwater elevations in 23 piezometers and estimated stage in the Sacramento River adjacent to the piezometers. These contour maps and hydrographs were used to evaluate gaining and losing conditions along the

Sacramento River and to estimate the hydraulic gradient between the River and the shallow aquifer.

3.2 Groundwater Elevation Contour Maps

Groundwater elevations and flow directions in the study area are illustrated on groundwater elevation contour maps. DWR (1997) includes spring water level contour maps for the years 1950, 1960, 1965, 1970, 1977, 1980, 1985, 1990, and 1992. As noted by DWR, groundwater generally flowed in a southwesterly direction (from the foothills toward the axis of the valley) under pre-development conditions. Groundwater levels began to decline during the 1940s (or earlier), and the 1960 water level contour map shows three pumping depressions. From north to south, these were located east of Nicolaus, near Pleasant Grove, and near the eastern edge of the Natomas Basin along the Sutter-Sacramento County line. By 1965, the pumping depression east of Nicolaus had largely disappeared, but the pumping depression near Pleasant Grove had deepened and merged with that along the eastern edge of the Natomas Basin. The 1980 DWR contour map shown on **Figure 3-2** indicates that, by 1980, the pumping depression southeast of Pleasant Grove had deepened to about –30 feet msl and merged with a deeper pumping depression beneath McClellan Air Force Base (AFB) in Sacramento County. These pumping depressions are centered about three miles east of the eastern edge of the Natomas Basin. Note that elevations shown on **Figures 3-2** and **3-3** are based on the NGVD 1929 vertical datum. These are copies of historical water level contour maps that cannot be converted to a newer datum. All other elevations in this report are based on the NAVD 1988 datum.

A fall 1997 groundwater elevation contour map for all of Sacramento County prepared by the Sacramento County Water Resources Division and reproduced in NCMWC (2002) is shown on **Figure 3-3**. This contour map indicates that the McClellan AFB pumping depression was linked with two other pumping depressions centered beneath the City of Elk Grove and east of the City of Galt. The Elk Grove pumping depression is the largest and deepest of the three, with a groundwater elevation below –70 feet msl at the center. The Pleasant Grove and McClellan AFB pumping depressions are located in the North American Subbasin; the other two depressions are located in the South American Subbasin.

The DWR and Sacramento County groundwater elevation contour maps were developed using data from wells of variable and often unknown perforated intervals. These composite maps must be considered approximations that do not reflect the fact that groundwater elevations can be significantly different in wells of different depths. Hydrographs of DWR's multiple-completion monitoring wells show that deeper wells in the area typically have lower groundwater elevations than shallower wells because most groundwater pumping occurs from deeper zones, which are more confined. Upper zone groundwater elevation contour maps were prepared for this study, as discussed below.

Water level data for wells completed in the upper zone in the North American Subbasin were evaluated to select recent periods with sufficient data for contouring purposes. Because the primary focus of this investigation is on groundwater flow in the Natomas Basin, contour maps were prepared for periods for which data from the USACE levee piezometers (the only piezometers with surveyed wellhead elevations prior to 2008) were available, and spring and fall

contour maps were prepared for 2003. Two versions of the 2003 contour maps were created, one showing the entire subbasin and another showing a more detailed view of the Natomas Basin. Data from about 90 wells were used to prepare each map. The subbasin-scale groundwater elevation contour maps have a contour interval of ten feet; the more detailed maps have a two-foot contour interval. The periods selected for groundwater elevation contour maps, area of coverage, and the number of wells used for each map are as follows:

- **Figure 3-4:** Spring 2003 (North American Subbasin),
- **Figure 3-5**: Spring 2003 (Natomas Basin),
- **Figure 3-6**: Fall 2003 (North American Subbasin),
- **Figure 3-7**: Fall 2003 (Natomas Basin).

The spring 2003 groundwater elevation contour map for the North American Subbasin (**Figure 3-4**) shows that the direction of groundwater flow in the upper zone in most of the subbasin is toward the pumping depression centered in the McClellan AFB area, which had a minimum elevation of about –40 feet msl based on data from McClellan AFB monitoring wells. The northeastern portion of the subbasin is the only area where the groundwater flow direction was not toward the McClellan AFB pumping depression on **Figure 3-4**. The direction of groundwater flow in the northeastern area is toward the Bear and Feather Rivers, which indicates that both rivers were gaining in the spring of 2003. A gaining reach occurs when groundwater levels are higher than the river stage, creating a gradient for groundwater to flow to the river. Losing conditions occur when the river stage is higher than groundwater levels adjacent to the river, which results in recharge from the River to the aquifer.

The Sacramento River west of the Natomas Basin appeared to be a losing reach in spring 2003. Groundwater elevations shown on **Figure 3-4** range from about 20 feet msl in the northern and northwestern portions of the Natomas Basin to about –15 feet msl in the southeastern corner. The direction of groundwater flow was easterly toward the McClellan AFB pumping depression. The hydraulic gradient was relatively flat especially in the northern half of the study area (about three ft/mile) but became much steeper along the eastern edge (up to 20 ft/mile).

In order to provide additional detail on groundwater elevations and flow directions in the Natomas Basin, the spring 2003 water level data were re-contoured with a contour interval of two feet. The resulting map, shown on **Figure 3-5**, confirms that the direction of groundwater flow was easterly across most of the Natomas Basin. All reaches of the Sacramento River appeared to be losing in the spring of 2003, but the magnitude of the hydraulic gradient near the River gradually increases from north to south. In the northern portion of the Natomas Basin, the hydraulic gradient for flow away from the River was less than three ft/mile. In the southern portion, the easterly hydraulic gradient increased to about nine ft/mile.

The fall 2003 groundwater elevation contour map shown on **Figure 3-6** is generally similar to the spring 2003 map, and the direction of groundwater flow was essentially the same during both periods. Comparison of the two contour maps indicates that fall groundwater levels along the Sacramento River were five to ten feet lower than in the spring, but levels at these two times were similar in the eastern portion of the Natomas Basin. Fall 2003 groundwater levels were

also similar to spring levels in the McClellan AFB pumping depression but were about ten feet lower than in the spring in the pumping depression in southwestern Placer County.

Figure 3-7 shows fall 2003 groundwater levels in the Natomas Basin re-contoured with a contour interval of two feet. Although groundwater levels in fall 2003 were lower along the Sacramento River than in the spring, the general direction of groundwater flow was still easterly in most of the study area. The only exception is the northern portion of the Natomas Basin where the direction of groundwater flow was to the south-southwest parallel to the Sacramento River. These reaches of the River appear to be neutral (no significant gain or loss) in fall 2003. Losing conditions prevailed in the southern reaches, but the gradient for flow away from the River was less steep than in the spring.

3.3 Hydrographs of Groundwater Levels and River Stage

Water level hydrographs were prepared for the shallow piezometers along the Sacramento River East Levee in order to evaluate seasonal variations in gaining and losing conditions. In addition to groundwater elevation data from the levee piezometers, river stage estimates are also shown on the hydrographs. Under separate contract for SAFCA, MBK Engineers (MBK) used stage data from the Verona, Bryte, and I Street gages (**Figure 3-8**) to estimate the daily average stage at each piezometer location based on a linear interpolation (Mike Archer, MBK, pers. comm., January 22, 2008). One source of error in the stage estimates is that tidal effects at the Bryte and I Street gages do not propagate upstream to the Verona gage. However, MBK checked the estimates against stage profiles simulated with a calibrated Hydrologic Engineering Center (HEC) surface water model, and concluded that the stage estimates were reasonable.

Hydrographs of groundwater elevations in the shallow piezometers and estimated Sacramento river stage are shown from north to south on **Figures 3-9** through **3-16**. Where piezometers are paired based on distance from the River, data from both piezometers are plotted on the same hydrograph using different symbols. As discussed above, losing conditions occur when groundwater elevations are lower than river stage. For the paired piezometers, a gradient away from the River indicates losing conditions, while a gradient toward the River indicates gaining conditions. The groundwater level data are color coded on the hydrographs, with data showing losing conditions plotted in red and data showing gaining conditions plotted in blue. For the piezometers with surveyed elevations, stage estimates can also be compared with measured groundwater elevations to indicate gaining or losing conditions at unpaired piezometer locations. The groundwater level data plotted on these hydrographs are also color coded to show gaining or losing conditions. Uncertainty in the data is highlighted by the fact that a number of hydrographs show gaining conditions in the spring and fall of 2003 even in the southern half of the Natomas Basin, while the groundwater elevation contour map (**Figure 3-8**) shows losing conditions in this area.

During the winter when the river stage is high, all hydrographs show losing conditions and steep gradients for groundwater flow away from the River. The results are much more variable during the rest of the year when the river stage is lower. Hydraulic gradients are relatively flat during periods of low stage, and gradient reversals appear to be common. Gaining conditions are most likely to occur during the summer and fall when the river stage is lowest. There is more

uncertainty about the determination of gaining or losing conditions during the summer and fall because groundwater levels and river stage are similar during these periods. There is also uncertainty during periods of rapidly declining stage because groundwater levels decline at a slower rate than river stage. Continuous data would be needed during these periods to accurately determine the fluctuations between gaining and losing conditions.

Gaining and losing reaches vary by both location and time. URS (2003) indicated that river stage was approximately nine to ten feet above groundwater levels at high stage and one to three feet below groundwater levels at low stage at the northernmost USACE piezometer (2F-01-15N). At the southernmost USACE piezometer (2F-01-19S), river stage was approximately four to five feet above groundwater levels at high stage and one to 1.5 feet below groundwater levels at low stage. For USACE paired piezometers 2F-01-26N and 28N, URS noted that groundwater levels were about 1.25 feet higher in the piezometer closer to the River during high stage and generally similar during low stage. For paired piezometers 2F-01-68N and 69N, URS indicated that groundwater levels were about three feet higher in the piezometer closer to the River during high stage and generally similar during low stage. URS also noted that groundwater levels tended to lag river stage by several days (URS, 2003). The individual hydrographs are discussed below.

Figure 3-9 shows hydrographs of the northernmost piezometers. This includes USACE piezometer 2F-01-15N in Reach 2 and paired Kleinfelder piezometers PZ-7 and PZ-8 in Reach 4a. The hydrograph of 2F-01-15N shows losing conditions during periods of high stage in the winter and spring and gaining conditions during the rest of the year. This is the deepest of the levee piezometers with a screened interval of 80 to 90 feet. This makes the comparison with river stage less valid, but there are no nearby shallow piezometers to show the head difference between shallow and deeper zones. Paired piezometers PZ-7 and PZ-8 show losing conditions during a limited period of record (intermittent from October 13, 2004 to July 12, 2006). The fact that the groundwater elevations were notably lower than the stage estimates for all periods suggests inaccuracies in either the stage estimates, the wellhead elevation, or the water level measurements. The indication of consistently losing conditions should be considered questionable since most other piezometers show a mix of gaining and losing conditions.

Figure 3-10 shows hydrographs of paired USACE piezometers 2F-01-26N and 28N in Reach 4b and paired Kleinfelder piezometers PZ-5D and PZ-6D in Reach 6b. Both piezometer pairs show generally losing conditions during the winter and spring and consistently gaining conditions during the summer and fall. The continuous transducer data from the Kleinfelder piezometers clearly show losing conditions at high stage and gaining conditions at low stage during the winter and spring. This effect is especially noticeable from December 2004 to May 2005 but also occurred during the winter and spring of 2005-2006.

Figure 3-11 show hydrographs of unpaired USACE piezometers 2F-01-51N in Reach 8 and 2F-01-49N in Reach 9a, and **Figure 3-12** show hydrographs of unpaired USACE piezometers 2F-01-56N in Reach 9b and 2F-01-62N in Reach 11b. Compared against estimated river stage, all four piezometers show mostly losing conditions except during periods of rapidly fluctuating stage in the spring and periods of very low stage during the fall. The spring of 2003 was the longest period of gaining conditions during the 22-month period of record.

Figure 3-13 shows hydrographs of paired Kleinfelder PZ-3 and PZ-4 and USACE piezometers 2F-01-68N and 69N in Reach 11b. Piezometers PZ-3 and PZ-4 show losing conditions based on groundwater level data during the entire period of record (October 13, 2004 to October 7, 2006). As for piezometers PZ-7 and PZ-8, the fact that the groundwater elevations were notably lower than the stage estimates for all periods suggests inaccuracies in either the stage estimates, the wellhead elevation, or the water level measurements. The indication of consistently losing conditions should be considered questionable since most other piezometers show a mix of gaining and losing conditions. The data from paired USACE piezometers 2F-01-68N and 69N in Reach 11b are more similar to piezometers in other reaches, with losing conditions occurring during periods of high stage and a mixture of gaining and losing conditions during the rest of the year. Gaining conditions occurred primarily in the spring of 2002 and during periods of lowest stage.

Figure 3-14 shows hydrographs of unpaired USACE piezometers 2F-01-05S in Reach 13 and 2F-01-15S in Reach 15 compared with estimated stage. Most of the data from 2F-01-05S appear to be questionable, with low groundwater levels in the spring and higher levels during the summer, especially in 2002. The data from USACE piezometer 2F-01-15S in Reach 13 track the estimated stage much more closely, but the estimated stage appears to be low relative to the groundwater levels. In particular, the indication of gaining conditions during almost all of 2002 is probably incorrect. The stage estimates appear to be more accurate from December 2002 through October 2003, with losing conditions during periods of high or rising stage and gaining conditions during periods of low or declining stage.

Figure 3-15 shows hydrographs of unpaired USACE piezometers 2F-01-17S and 2F-01-19S in Reach 16 compared with estimated stage. Both piezometers have similar hydrographs, and the estimated stage tracks the groundwater data closely. The hydrographs generally show losing conditions during periods of high or rising stage and gaining conditions during periods of low or declining stage.

Figure 3-16 shows hydrographs of paired Kleinfelder piezometers in Reaches 18b and 19a. The transducers in Kleinfelder piezometers PZ-1 and PZ-2 were not working during most of the monitoring period. Almost all of the data that were collected in January and June-August 2005 show gaining conditions, which is inconsistent with the other piezometers. Water level measurements in paired Kleinfelder piezometers LMW-1 and LMW-4 were made manually, but the measurements made prior to January 2006 appear to be too high when compared with the estimated stage. The measurements made from December 2005 to April 2006 appear to be more reasonable but were made only during periods of high stage. The groundwater level data indicate losing conditions throughout this period.

Depths to water measured in the USACE piezometers located on the land side levee toe typically range from about six feet during the winter to about 18 feet during the summer and fall. This represents a seasonal fluctuation of only about 12 feet. Similarly high groundwater levels and small seasonal fluctuations have been observed at DWR's multiple-completion wells elsewhere in the Natomas Basin. The small seasonal fluctuations are due to a combination of the buffering effect of recharge from the River and from rice fields throughout the Natomas Basin and the fact that most pumping is from deeper zones. Recharge from rice irrigation in the summer months

keeps shallow groundwater levels high and is a primary factor in the gaining conditions observed at many of the levee piezometers during periods of low stage.

3.4 Hydraulic Gradient Estimates

The differences in hydraulic head between the paired piezometers and also between the unpaired piezometers and the estimated River stage are tabulated in **Table 3-2**, and these head differences were used to estimate the hydraulic gradient. Losing conditions are indicated by positive head differences and hydraulic gradients, and negative values indicate gaining conditions. Head differences were calculated for the entire period of record and range from about –3 feet to more than 11 feet. For paired piezometers that have been surveyed, head differences were calculated based on both groundwater data and stage estimates.

Average annual head differences and hydraulic gradients were calculated for each individual or paired piezometer based on the most recent 12-month period for which data are available. Due to the problems with some of the piezometer data discussed above, hydraulic gradients were not calculated for USACE piezometer 2F-01-15S and Kleinfelder piezometers PZ-1, PZ-2, LMW-1, and LMW-4. For the two sets of paired USACE piezometers, gradients were estimated by comparing the estimated stage with head in the piezometer closest to the River. Because more data were available from the USACE piezometers during the winter and spring, an average hydraulic gradient was calculated for each month. The monthly gradients were then averaged to determine the average hydraulic gradient for the 12-month period.

As shown in **Table 3-2**, the minimum hydraulic gradient at each piezometer location ranged from –0.0098 to 0.0003 ft/ft, with an average of –0.0039 ft/ft. The minimum hydraulic gradient was negative at all but one site, which indicates gaining conditions. The maximum hydraulic gradient ranged from 0.0054 to 0.0239 ft/ft, with an average of 0.0161 ft/ft. The magnitude of the average maximum hydraulic gradient (0.0239 ft/ft) is more than twice as large as the average minimum gradient (–0.0098 ft/ft) because the gradient is steeper during periods of high stage.

Average monthly hydraulic gradients were calculated for 13 piezometer locations (individual or paired), and an average annual gradient was calculated by averaging the monthly values. As shown in **Table 3-2**, the average annual hydraulic gradient at each piezometer ranged from 0.0006 to 0.0089 ft/ft. All of the average annual hydraulic gradients were positive, which indicates that all reaches exhibited losing conditions over the 12-month period. Although the groundwater elevation contour maps show steeper gradients in the southern portion of the Natomas Basin, there are too many sources of error in the gradient estimates to allow quantification of these spatial variations.

The average annual hydraulic gradient for all piezometers shown in **Table 3-2** was 0.0032 ft/ft or about 17 ft/mile. This represents the estimated average annual gradient for seepage loss from the River to the shallow aquifer based on a combination of piezometer data and estimated stage. This gradient is almost twice as steep as the maximum gradient east of the Sacramento River shown on the spring and fall 2003 groundwater elevation contour maps for the Natomas Basin (**Figures 3-5** and **3-7**). The groundwater contour maps are based on groundwater data only and have too large a scale to show the gradient between these closely spaced piezometers. The

steeper gradient near the River calculated above is also due to the low permeability of the riverbed and the fact that the greatest head differences between surface water and groundwater occur during periods of high stage.

Table 3-1
Construction of Sacramento River East Levee Piezometers in Natomas Basin

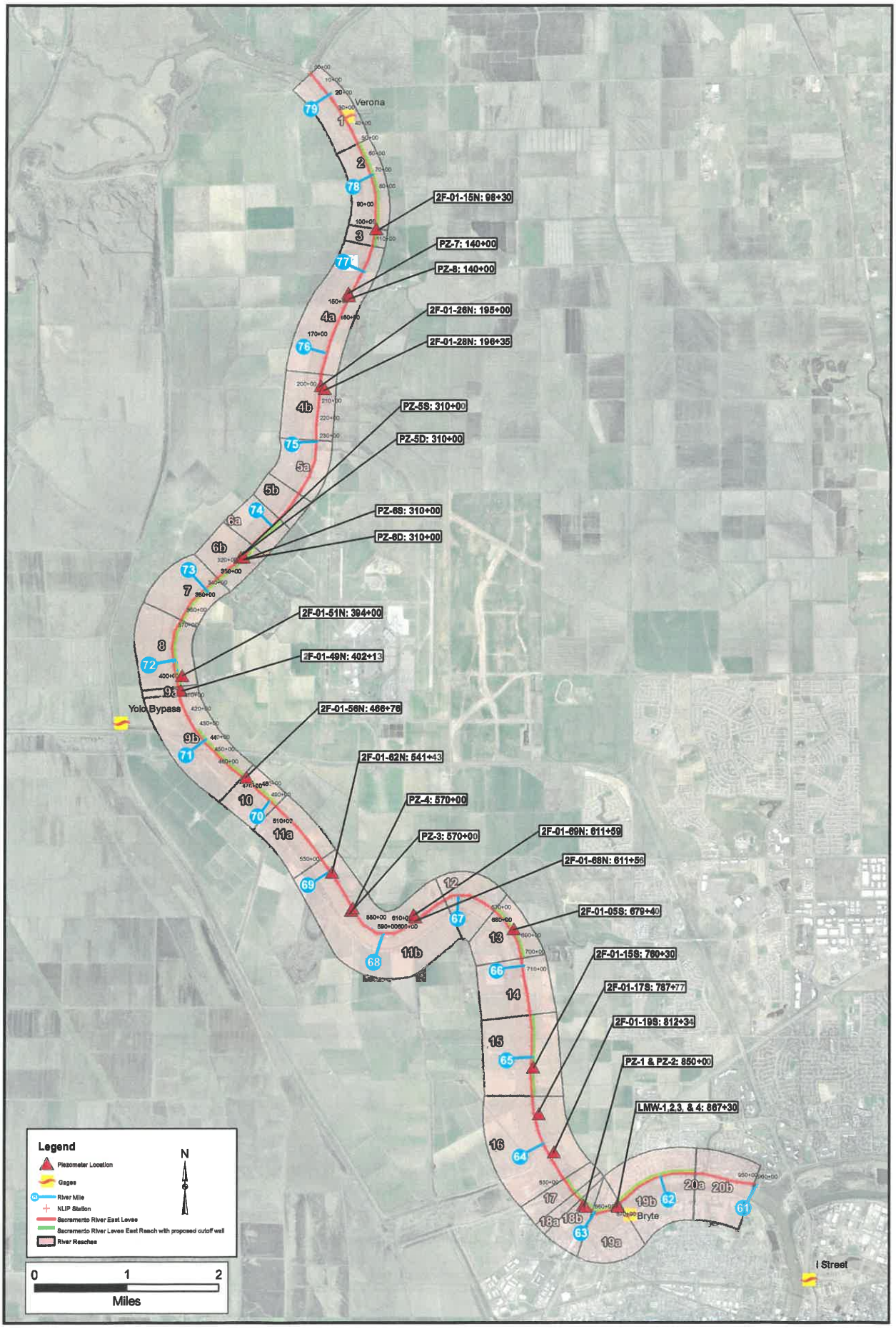
Well ID	NLIP Station	River Mile (Approx)	Levee Mile (Approx)	Land Side Offset (Approx.) (ft)	Ground Surface Elevation (ft msl)[1]	Wellhead Elevation (ft msl)[1]	Screened Interval (ft)	Northing (ft)[2]	Easting (ft)[2]	Installed By	Date Drilled
2F-01-15N	98+30	76.8	1.9	0	27.38	29.18	80 - 90	2037443	6678210	USACE	2001
2F-01-26N	195+00	74.9	3.7	0	28.44	31.26	45 - 46	2028392	6675030	USACE	2001
2F-01-28N	196+35	74.9	3.7	250	29.79	31.03	38 - 48	2028227	6675252	USACE	2001
2F-01-51N	394+00	71.0	7.5	200	25.66	25.36	30 - 37	2011639	6667053	USACE	2001
2F-01-49N	402+13	70.9	7.6	0	27.67	27.29	40 - 60	2010756	6666969	USACE	2001
2F-01-56N	466+76	69.7	8.8	100	25.43	27.79	30 - 40	2005770	6670729	USACE	2001
2F-01-62N	541+43	68.2	10.3	50	27.16	29.34	33 - 43	2000269	6675756	USACE	2001
2F-01-68N	611+56	67.0	11.6	50	24.95	24.78	30 - 40	1997685	6680572	USACE	2001
2F-01-69N	611+59	67.0	11.6	200	23.99	23.79	26 - 36	1997813	6680474	USACE	2001
2F-01-05S	679+40	65.9	12.9	100	24.03	23.50	25 -35	1996993	6686228	USACE	2001
2F-01-15S	760+30	64.3	14.4	0	26.78	29.33	25 - 35	1988983	6687344	USACE	2001
2F-01-17S	787+77	63.7	14.9	100	21.81	21.56	30 - 40	1986284	6687689	USACE	2001
2F-01-19S	812+34	63.2	15.4	250	22.55	25.16	35 - 45	1984077	6688570	USACE	2001
LMW-1	867+30	62.2	16.5	Land Side	23.28	40.06	20 - 25	1980996	6692226	Kleinfelder	Oct. 1998
LMW-4	867+30	62.2	16.5	Water Side	22.28	40.36	20 - 25	1980918	6692285	Kleinfelder	Oct. 1998
LMW-2	867+30	62.2	16.5	Land Side	20.68	40.06	40 - 45	1980996	6692226	Kleinfelder	Oct. 1998
LMW-3	867+30	62.2	16.5	Water Side	21.88	40.36	40 - 45	1980918	6692285	Kleinfelder	Oct. 1998
PZ-7[3]	140+00	76.1	2.7	0	23.78	-	32 - 33	2033745	6676601	Kleinfelder	Oct. 2004
PZ-8	140+00	76.1	2.7	100	21.88	23.91	32 - 33	2033576	6676663	Kleinfelder	Oct. 2004
PZ-5S	310+00	72.7	5.9	0	36.28	37.71	11 - 12	2018478	6670369	Kleinfelder	Oct. 2004
PZ-5D	310+00	72.7	5.9	0	36.28	37.71	34 - 35	2018478	6670369	Kleinfelder	Oct. 2004
PZ-6S	310+00	72.7	5.9	100	32.48	33.78	12 - 13	2018489	6670533	Kleinfelder	Oct. 2004
PZ-6D	310+00	72.7	5.9	100	32.48	33.78	30.5 - 31.5	2018489	6670533	Kleinfelder	Oct. 2004
PZ-3	570+00	67.8	10.8	0	27.28	28.56	29.5 - 30.5	1998067	6676831	Kleinfelder	Oct. 2004
PZ-4[3]	570+00	67.8	10.8	100	25.68	-	32 - 33	1998216	6676951	Kleinfelder	Oct. 2004
PZ-1	850+00	62.5	16.1	0	23.28	25.81	32 - 33	1981001	6690265	Kleinfelder	Oct. 2004
PZ-2	850+00	62.5	16.1	100	21.48	24.11	31 - 32	1980925	6690401	Kleinfelder	Oct. 2004

1. Vertical datum = NAVD88
2. Horizontal datum = NAD83, California State Plane Zone 2.
3. Destroyed.

Table 3-2
Hydraulic Gradients Along Sacramento River East Levee Based on Groundwater Elevations in Shallow Piezometers and Estimated Stage

Reach	NLIP Station	Monitoring Location		Distance[1] (ft)	Period of Record	Period for Annual Average	Head Difference (ft)[2]			Hydraulic Gradient (ft/ft)[2]		
		River Side	Land Side				Min	Max	Annual Average[3]	Min	Max	Annual Average[3]
2	98+30	River	2F-01-15N	370	01/07/02 - 10/28/03	11/01/02 - 10/31/03	-2.70	8.83	0.47	-0.0073	0.0239	0.0013
4a	140+00	PZ-7	PZ-8	100	10/13/04 - 07/05/06	08/01/05 - 07/31/06	-0.35	1.31	0.89	-0.0035	0.0131	0.0089
4b	195+00	2F-01-26N	2F-01-28N	220	01/07/02 - 10/28/03	11/01/02 - 10/31/03	-0.40	1.26	0.20	-	-	-
	196+35	River	2F-01-26N	260		11/01/02 - 10/31/03	-0.35	5.40	1.29	-0.0014	0.0208	0.0050
6b	310+00	PZ-5D	PZ-6D	100	10/14/04 - 07/12/06	08/01/05 - 07/31/06	-0.42	2.03	0.37	-0.0042	0.0203	0.0037
8	394+00	River	2F-01-51N	600	01/07/02 - 10/28/03	11/01/02 - 10/31/03	-1.83	9.92	1.82	-0.0030	0.0165	0.0030
9a	402+13	River	2F-01-49N	260	01/07/02 - 10/28/03	11/01/02 - 10/31/03	-1.47	6.28	0.99	-0.0057	0.0241	0.0038
9b	466+76	River	2F-01-56N	330	01/07/02 - 10/28/03	11/01/02 - 10/31/03	-1.34	4.98	0.77	-0.0041	0.0151	0.0023
11b	541+43	River	2F-01-62N	300	01/07/02 - 10/28/03	11/01/02 - 10/31/03	-2.95	3.45	0.33	-0.0098	0.0115	0.0011
	570+00	PZ-3	PZ-4	100	10/13/04 - 10/07/06	10/01/05 - 09/30/06	0.03	1.54	0.60	0.0003	0.0154	0.0060
	611+56	2F-01-68N	2F-01-69N	160	01/07/02 - 10/28/03	11/01/02 - 10/31/03	-0.53	2.94	0.44	-	-	-
	611+59	River	2F-01-68N	500		11/01/02 - 10/31/03	-1.95	7.13	0.54	-0.0039	0.0143	0.0011
13	679+40	River	2F-01-05S	520	03/05/02 - 09/30/03	10/01/02 - 09/30/03	-2.14	10.71	2.30	-0.0041	0.0206	0.0044
15	760+30	River	2F-01-15S	270	01/07/02 - 10/28/03	11/01/02 - 10/31/03	-0.97	1.92	-0.11	-	-	-
16	787+77	River	2F-01-17S	370	01/07/02 - 10/28/03	11/01/02 - 10/31/03	-0.76	2.90	0.29	-0.0020	0.0078	0.0008
	812+34	River	2F-01-19S	550	01/07/02 - 10/28/03	11/01/02 - 10/31/03	-0.97	2.96	0.32	-0.0018	0.0054	0.0006
18b	850+00	PZ-1	PZ-2	100	01/20/05 - 08/19/05	01/20/05 - 08/19/05	-1.21	1.06	-0.78	-	-	-
19a	867+30	LMW-4	LMW-1	100	02/03/99 - 04/24/06	11/01/05 - 10/31/06	-1.73	8.86	1.80	-	-	-
						Average	**-1.22**	**4.64**	**0.70**	**-0.0039**	**0.0161**	**0.0032**

1. Approximate distance between paired piezometers or between unpaired piezometers and Sacramento River.
2. Positive head differences and gradients indicate losing conditions (flow away from the River); negative values indicate gaining conditions.
3. The annual average was calculated from monthly averages to adjust for seasonal variations in the measurement frequency.



FILE: \public\SAFCA\GIS\Wells and Levee Location map.mxd DATE: 1/30/2008 4:01:06 PM

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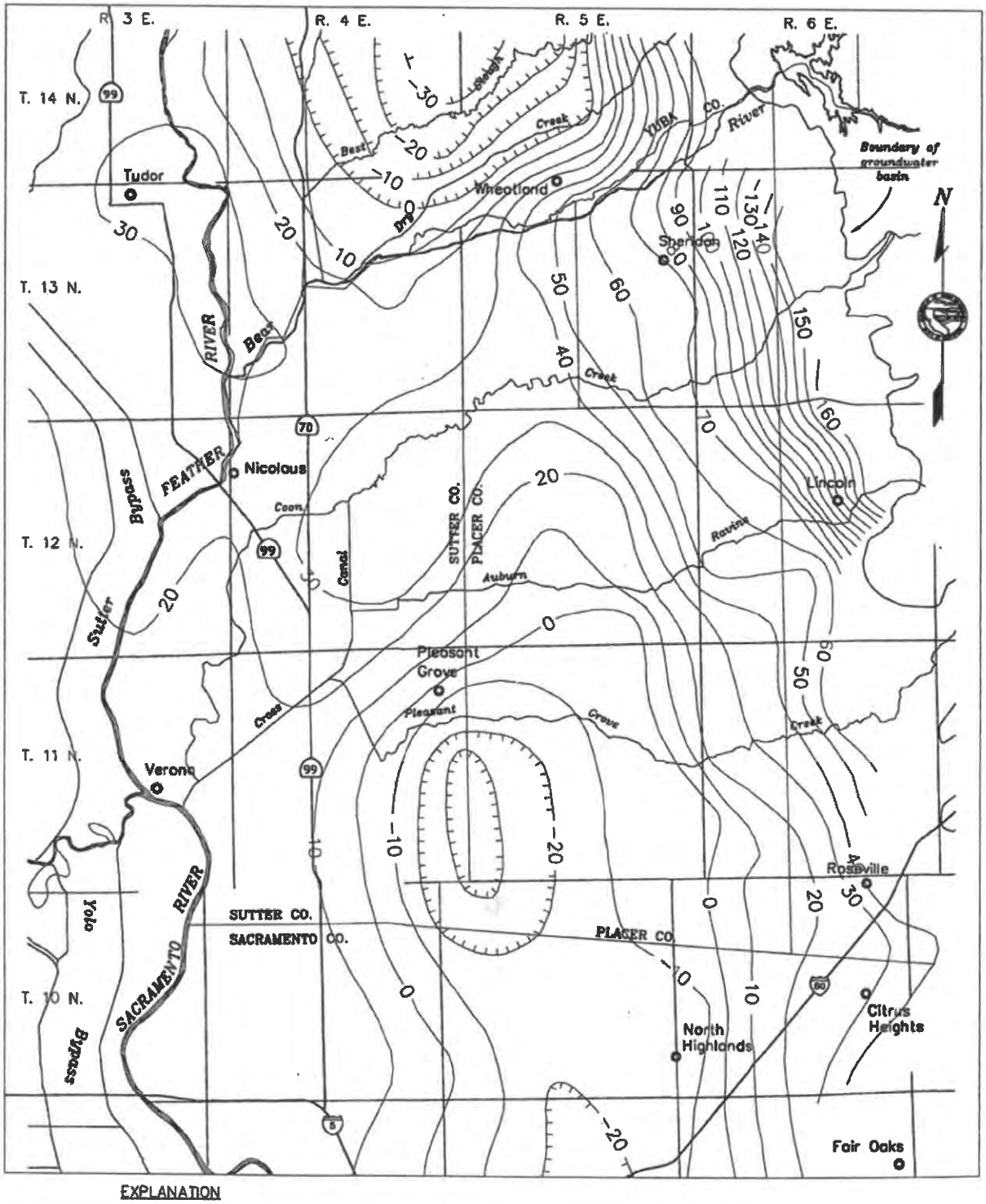
Figure 3-1
Piezometer Locations Along Sacramento River East Levee in Natomas Basin



FILE: \\server_pe2900\Public\Sutter Pointe 07-1-012\GIS\Figure 4-4 Spring 1980 GWE contours.mxd Date: 4/3/2009

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Figure 3-2
Spring 1980 Groundwater Elevation Contours
Multiple Zone Wells in North American Subbasin

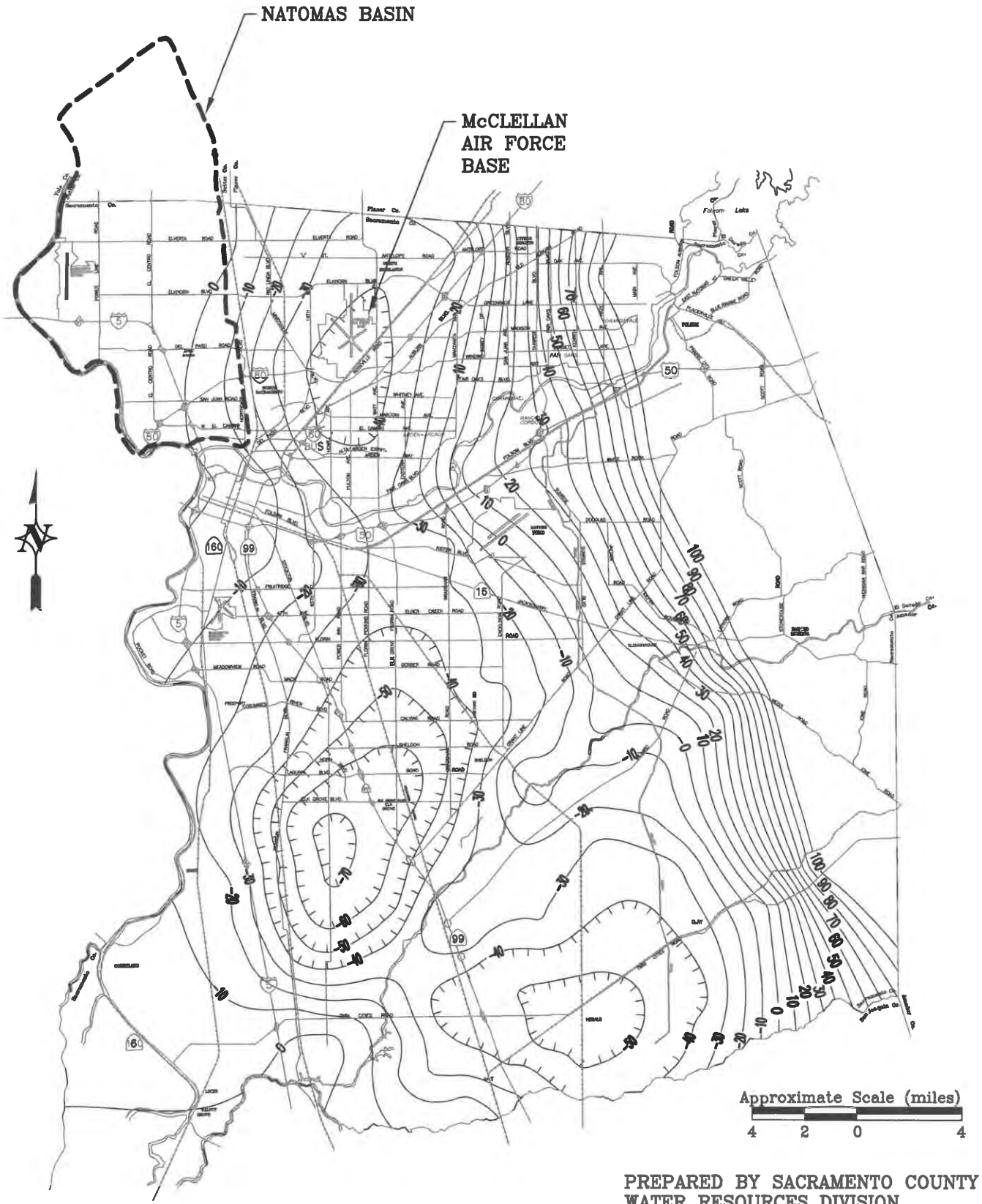

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Figure 3-3
Fall 1997 Groundwater Elevation Contours
Multiple Zone Wells in Sacramento County

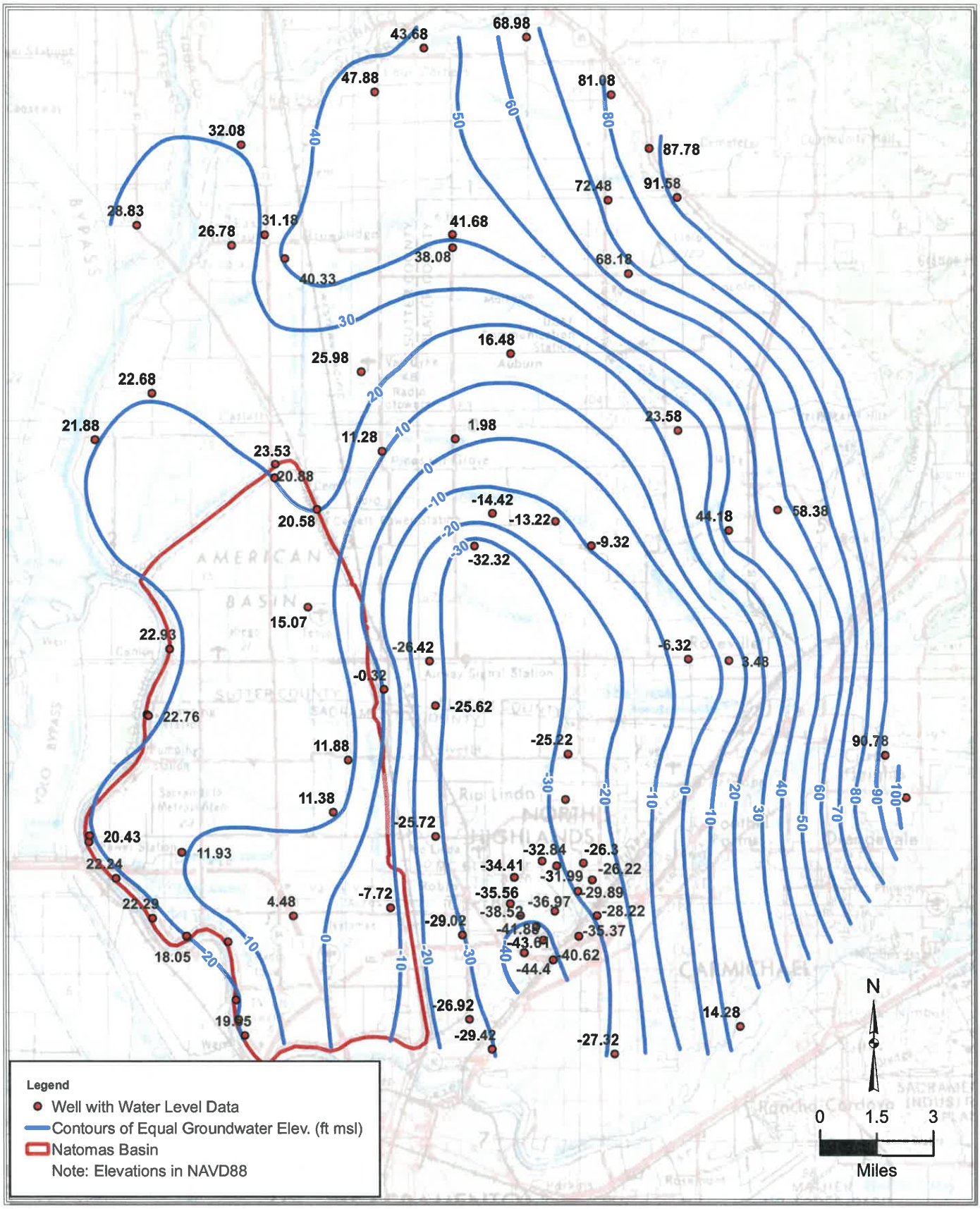

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Figure 3-4
Spring 2003 Groundwater Elevations Contours for Uppper Zone Wells in North American Subbasin

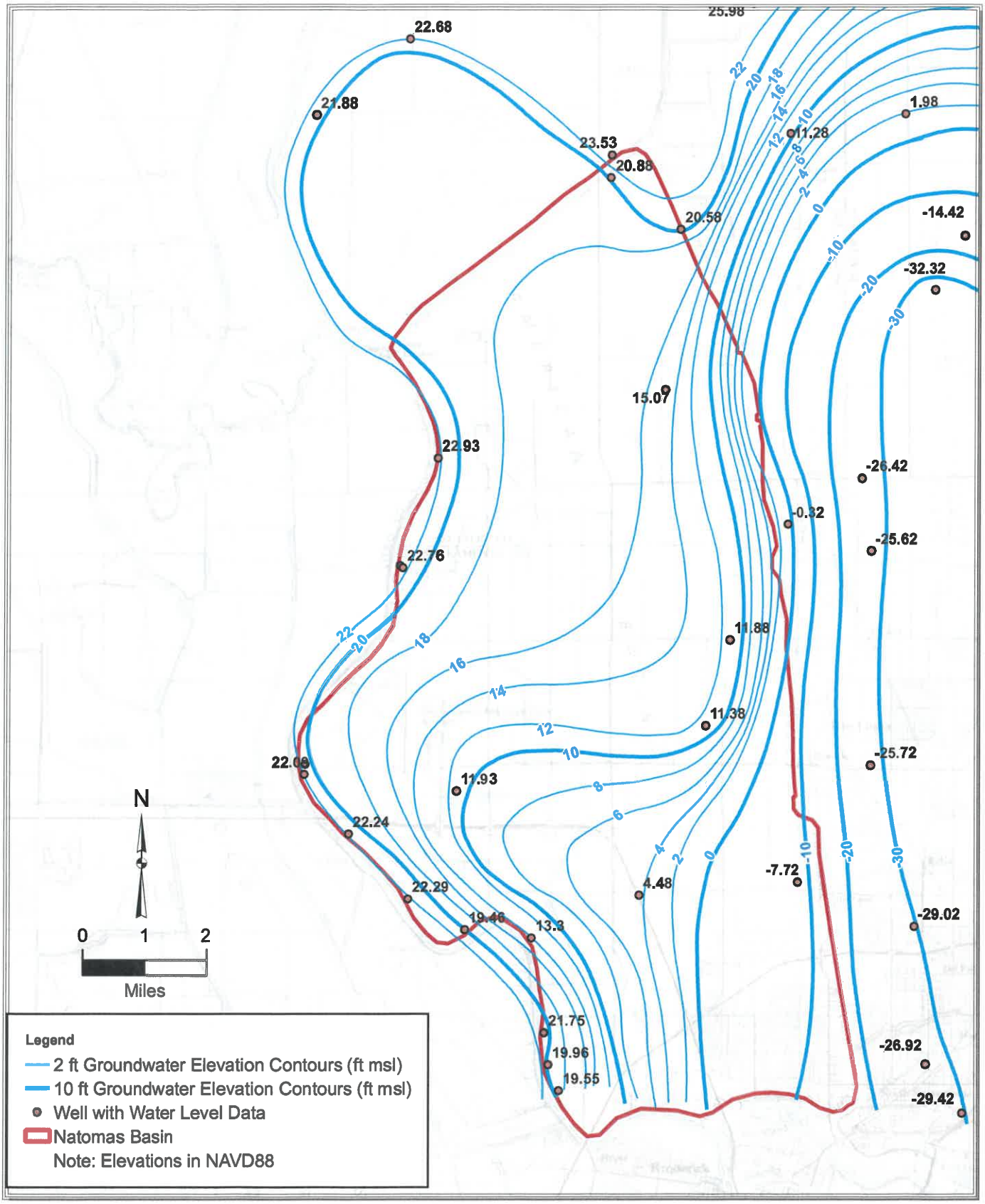

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Figure 3-5
Spring 2003 Groundwater Elevation Contours for Upper Zone Wells in Natomas Basin

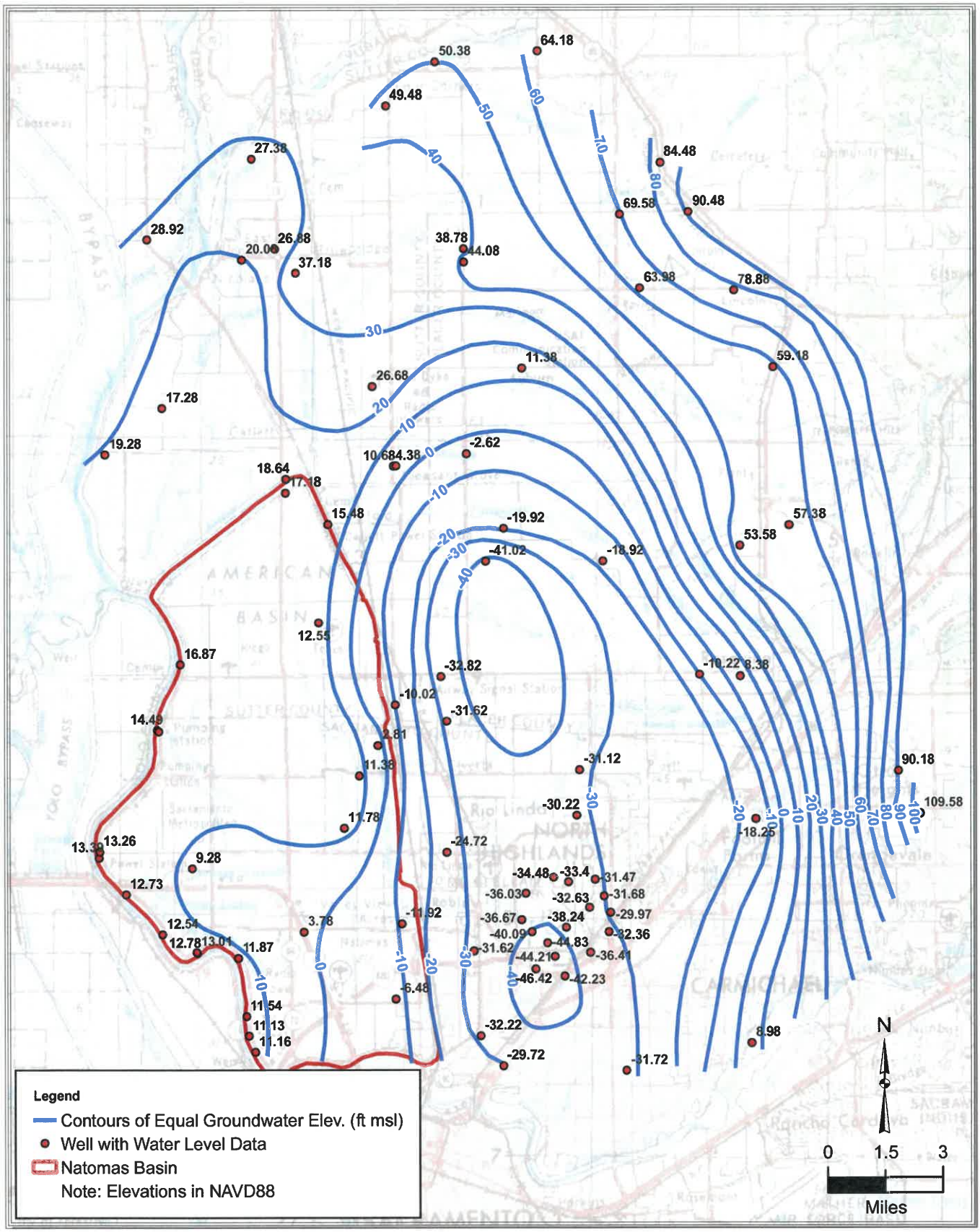

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Figure 3-6
Fall 2003 Groundwater Elevations Contours for Upper Zone Wells in North American Subbasin

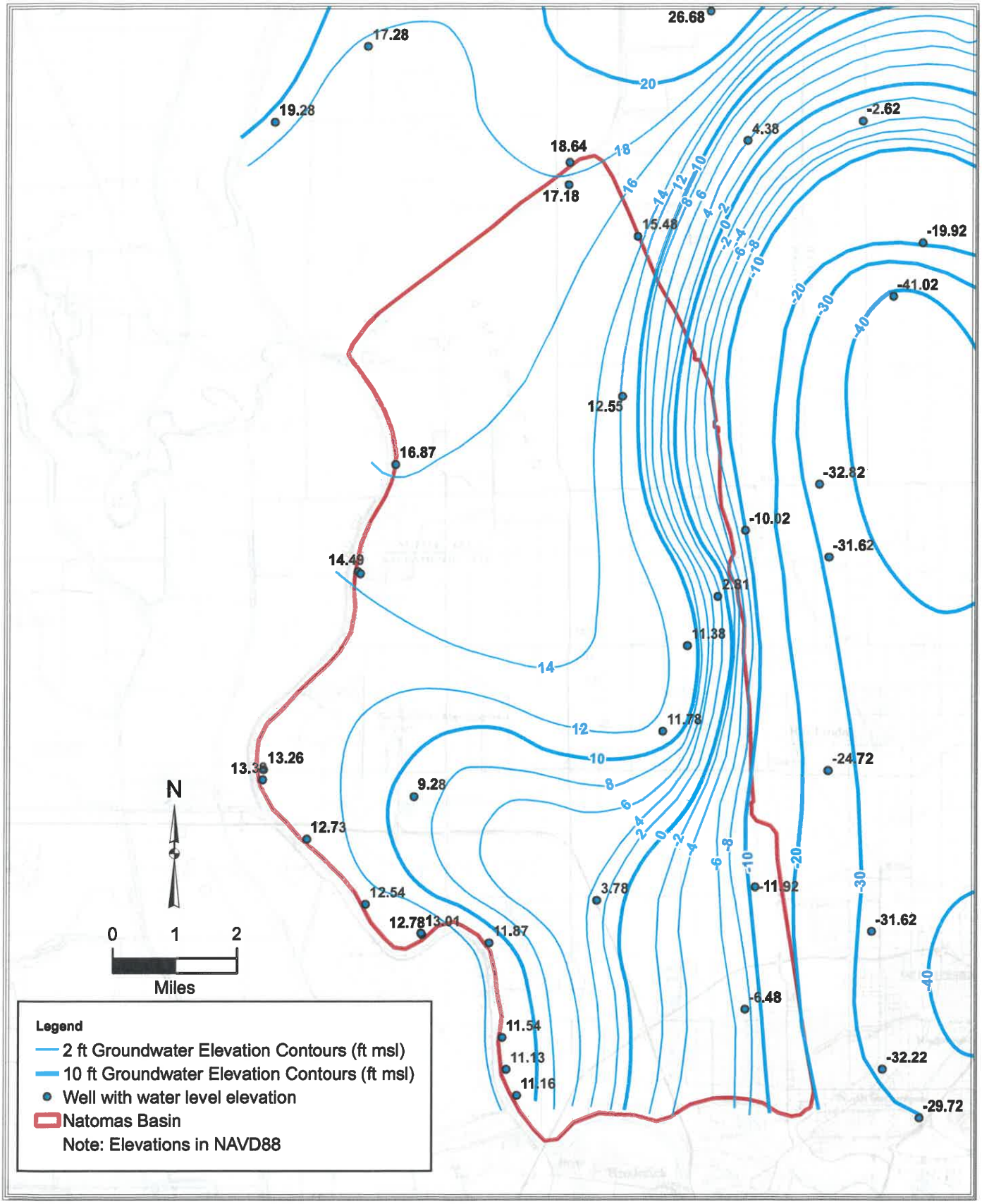

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Figure 3-7
Fall 2003 Groundwater Elevation Contours for Upper Zone Wells in Natomas Basin

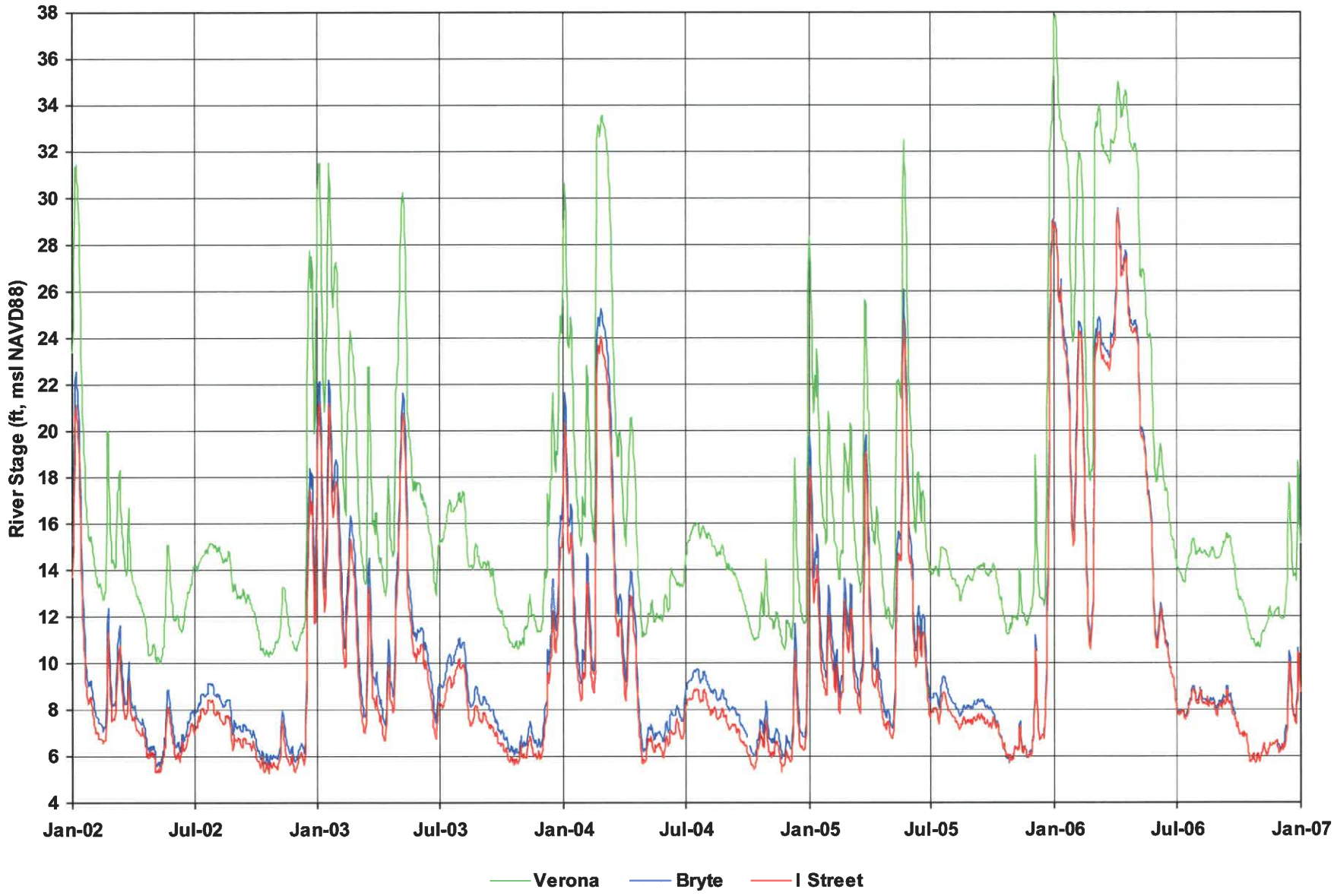

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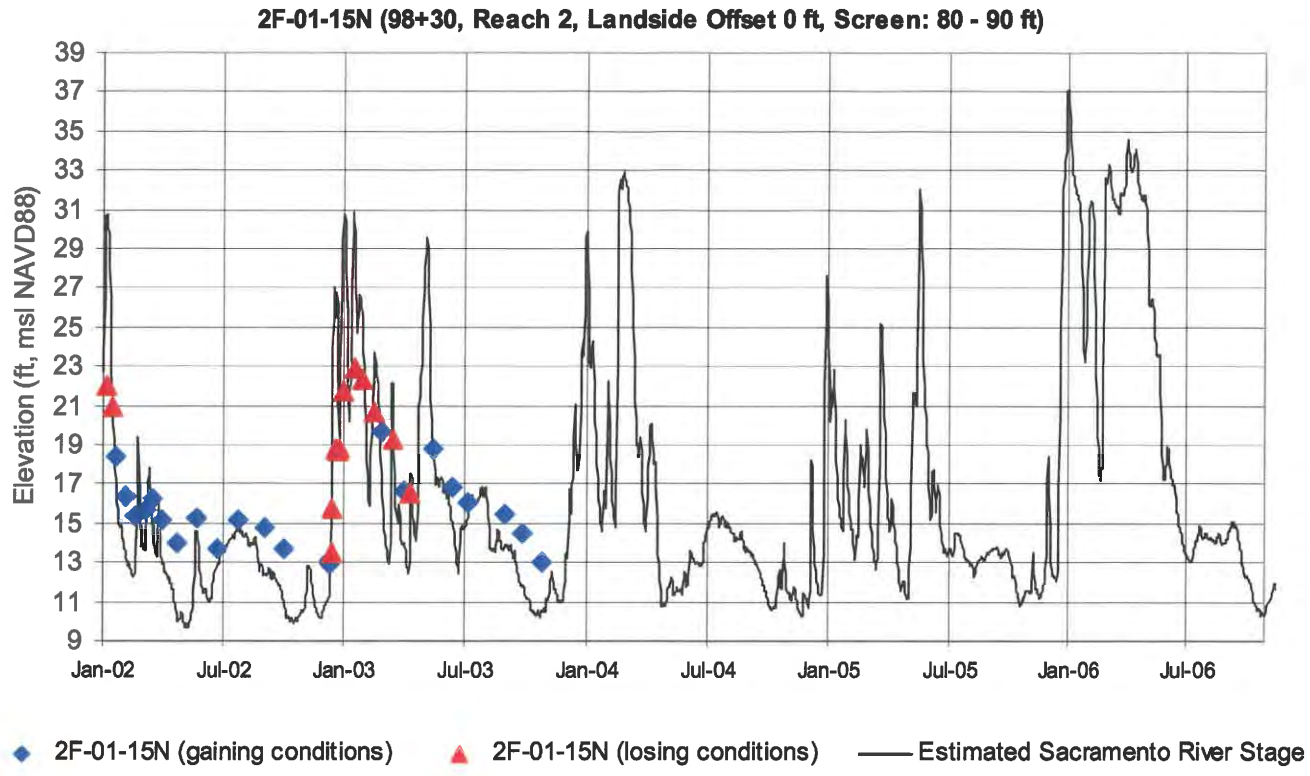
Figure 3-8
Hydrographs of Sacramento River Stage at the Verona, Bryte, and I Street Gages



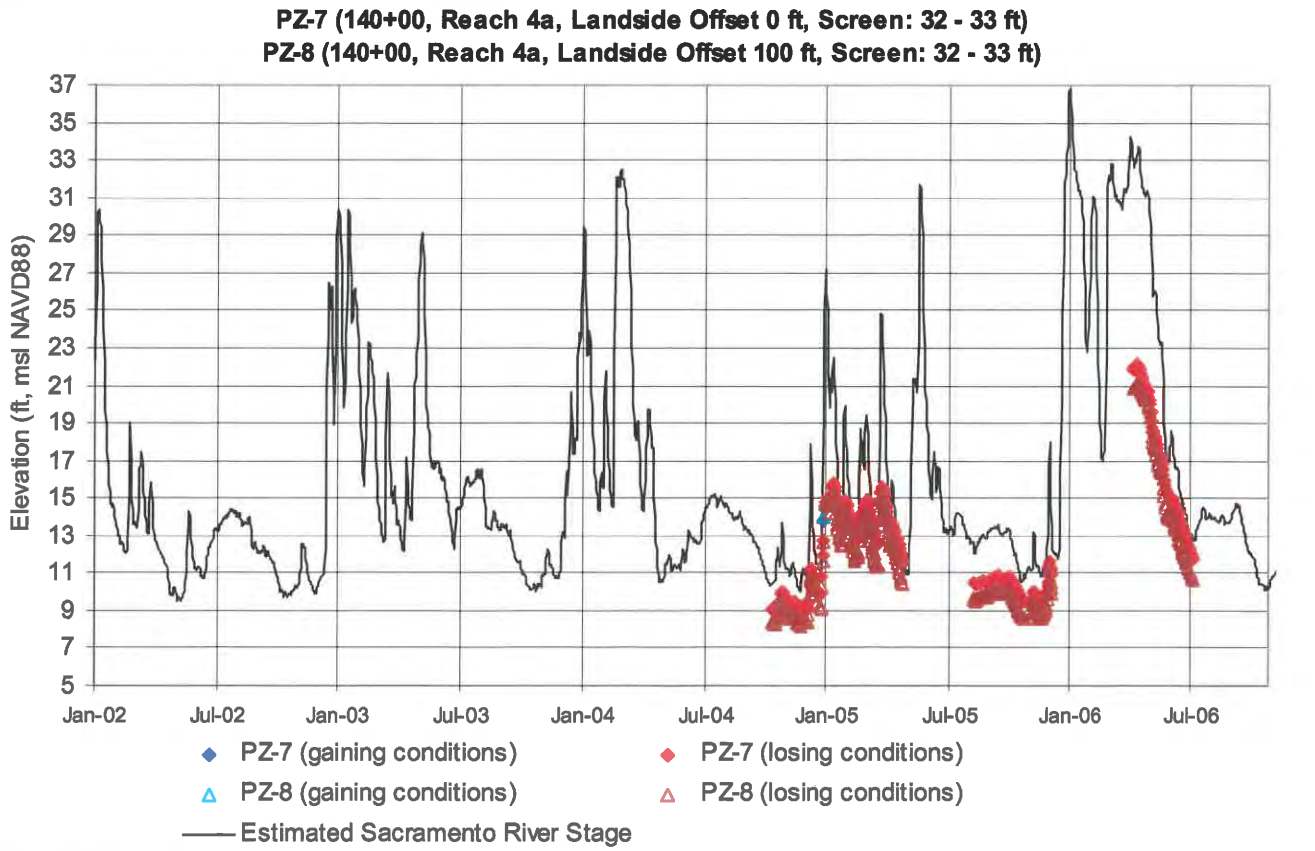


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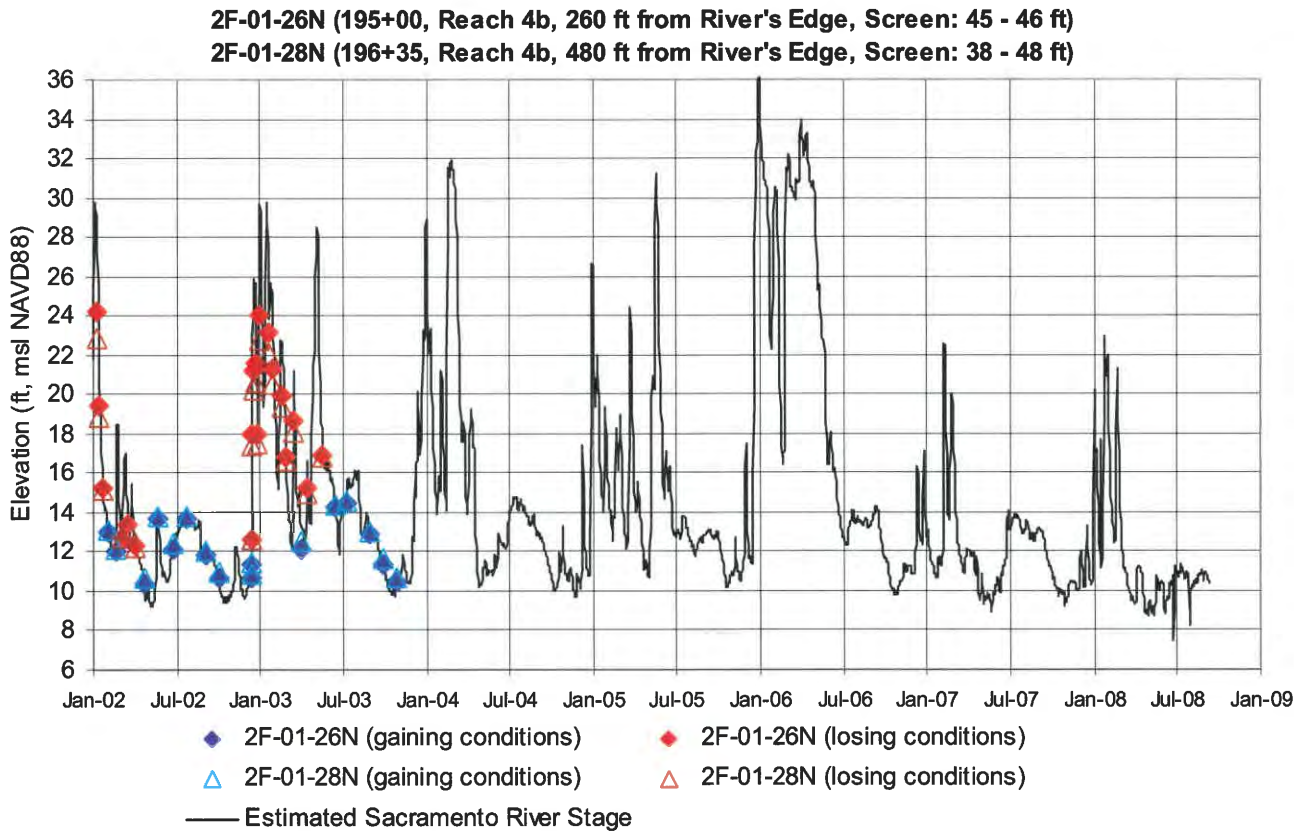
Figure 3-9
Hydrographs of Groundwater Elevations in Levee Piezometers and Estimated Stage in Reaches 2 and 4a



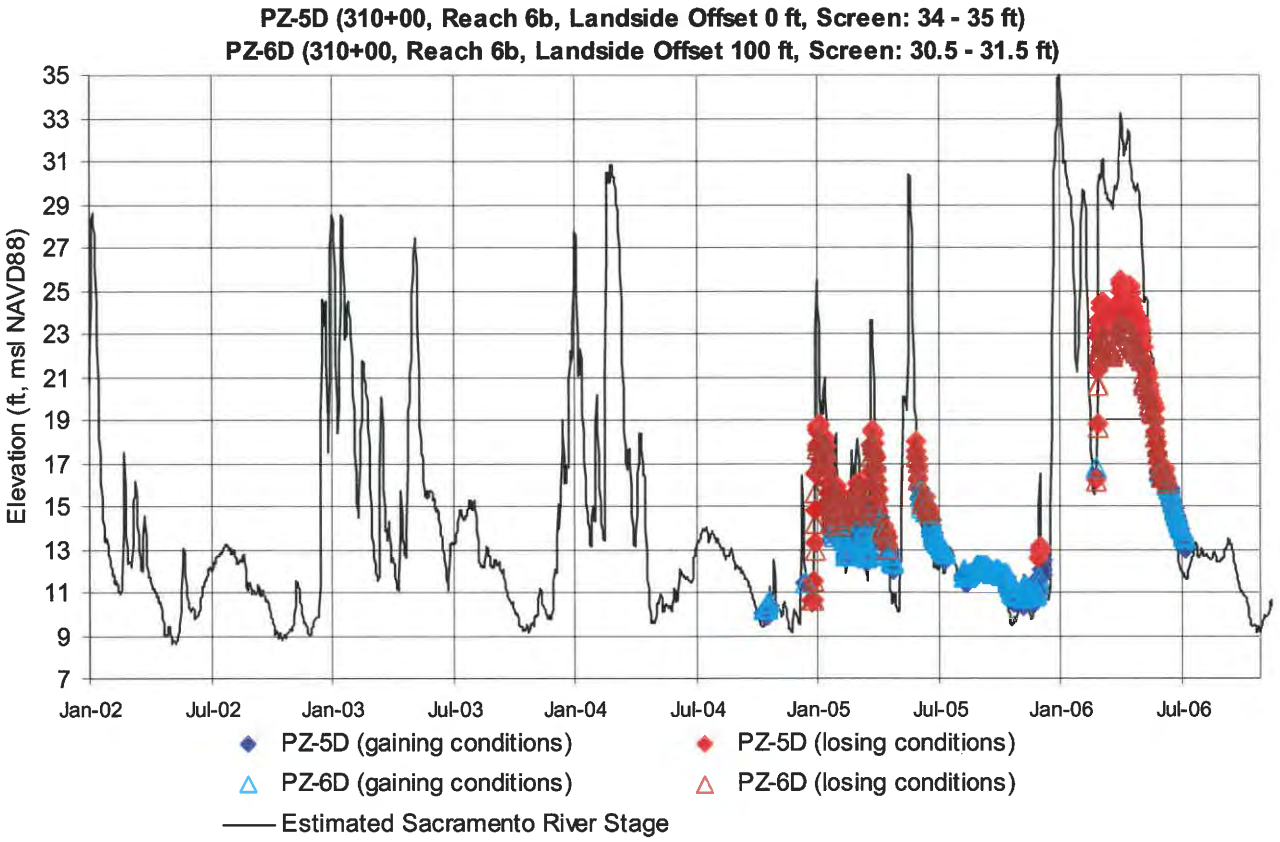


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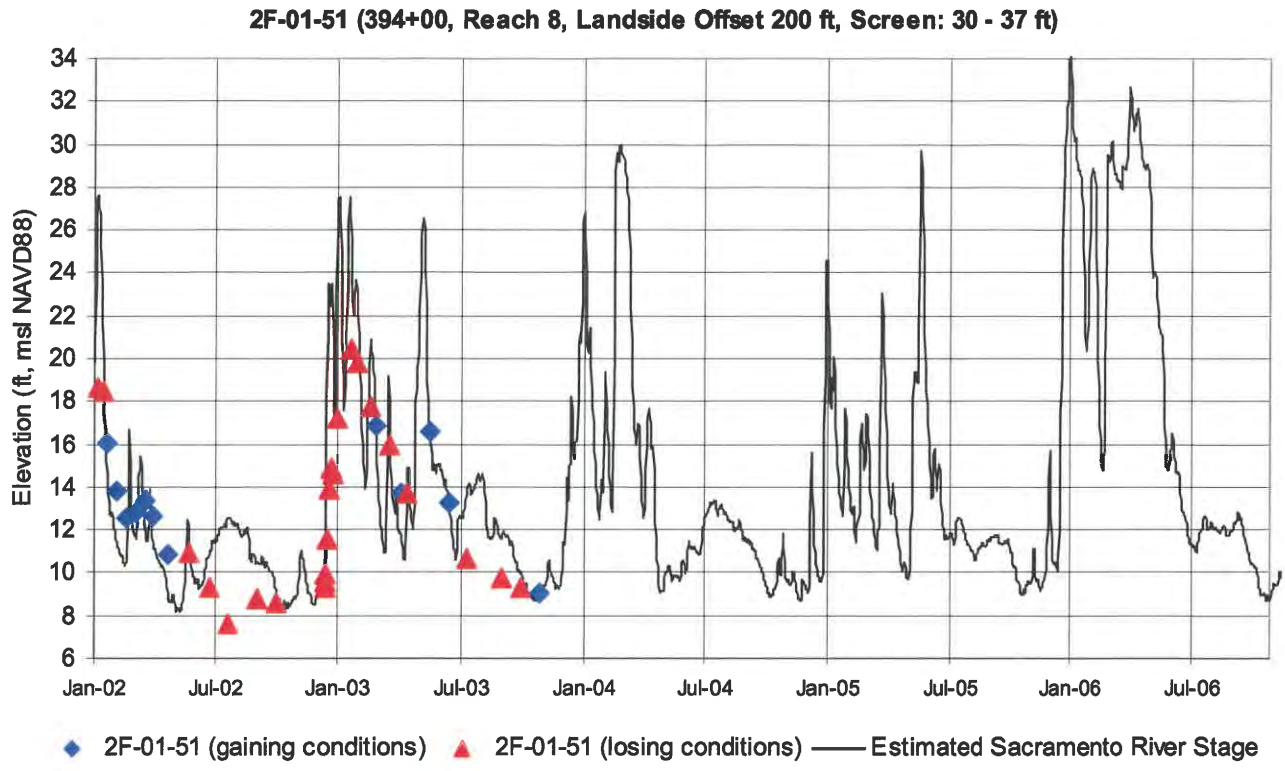
Figure 3-10
Hydrographs of Groundwater Elevations in Levee Piezometers and Estimated Stage in Reaches 4b and 6b



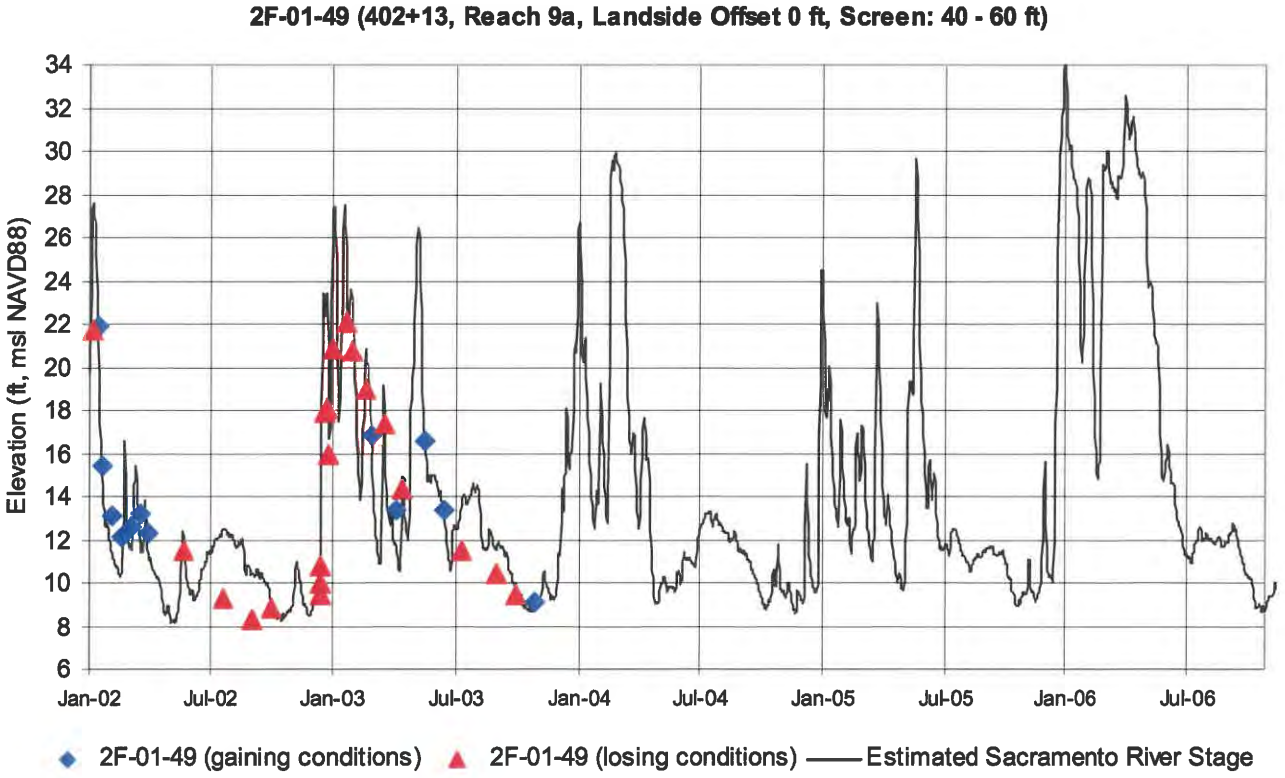


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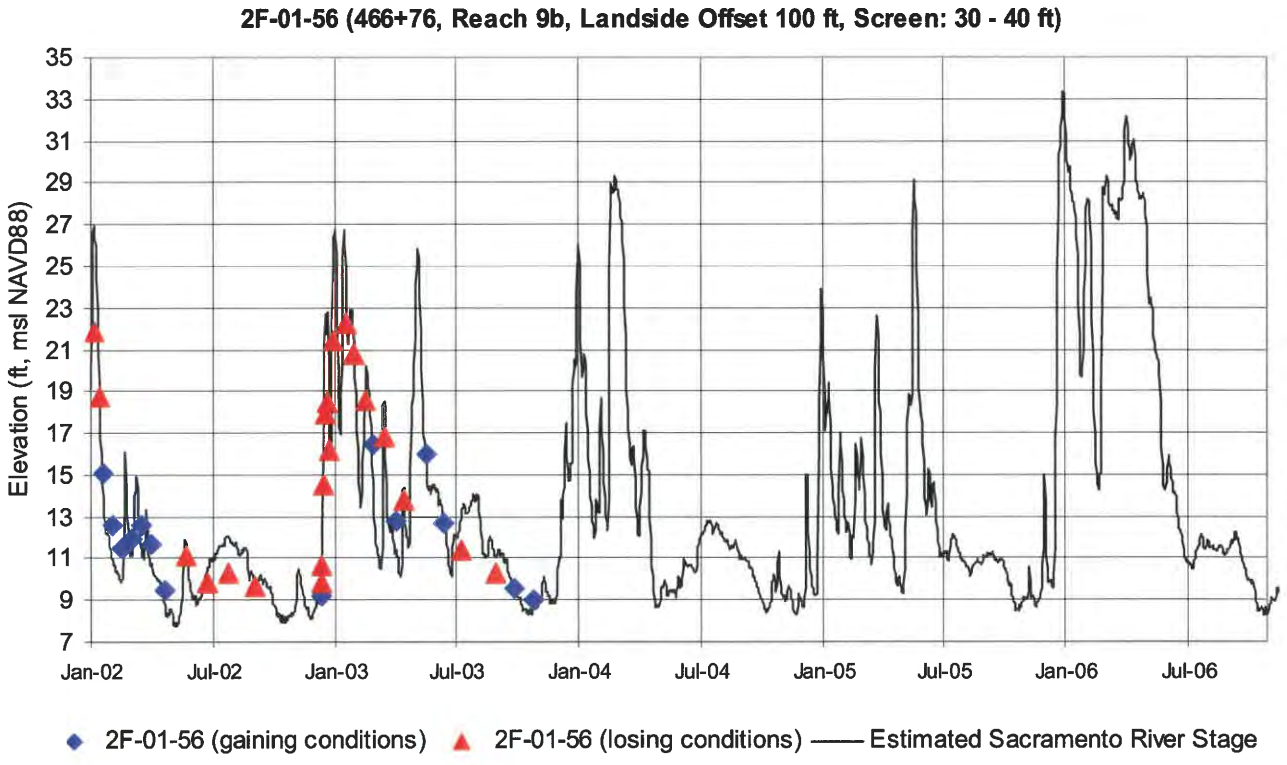
Figure 3-11
Hydrographs of Groundwater Elevations in Levee Piezometers and Estimated Stage in Reaches 8 and 9a



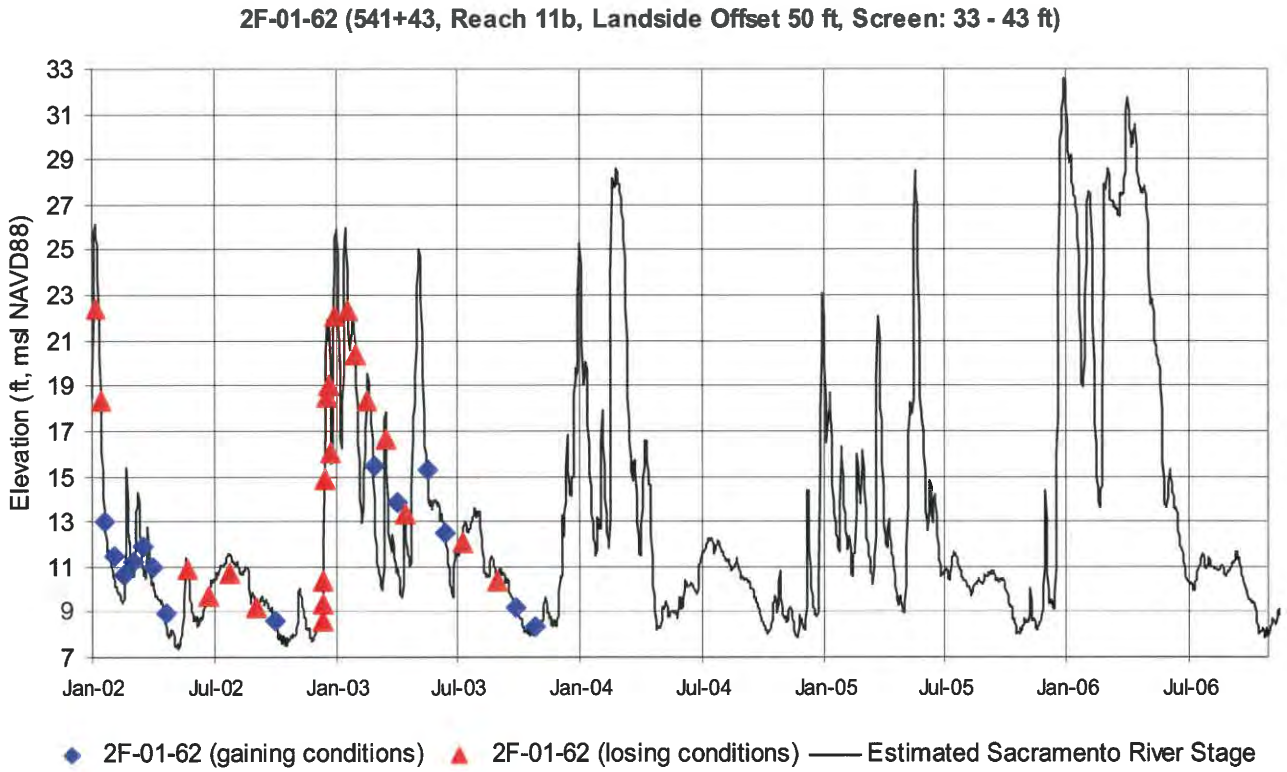


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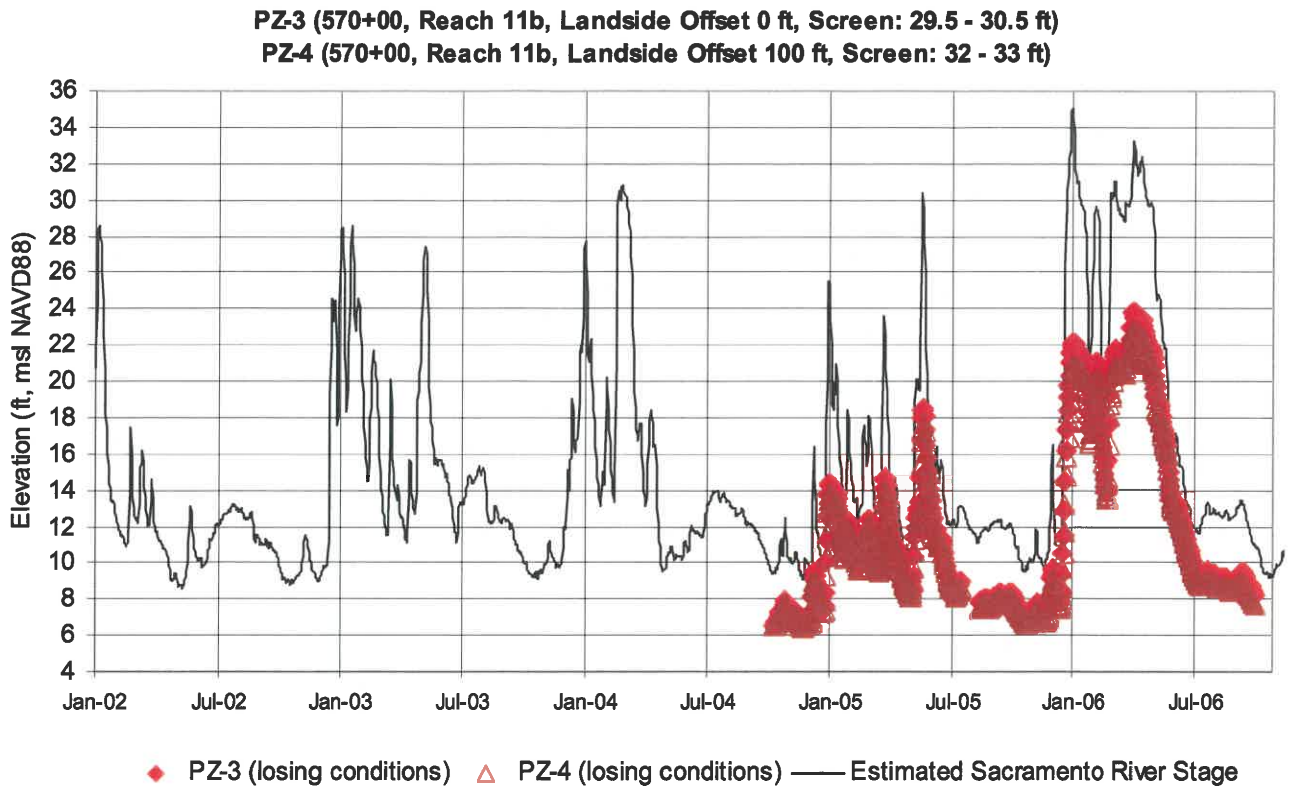
Figure 3-12
Hydrographs of Groundwater Elevations in Levee Piezometers and Estimated Stage in Reaches 9b and 11b



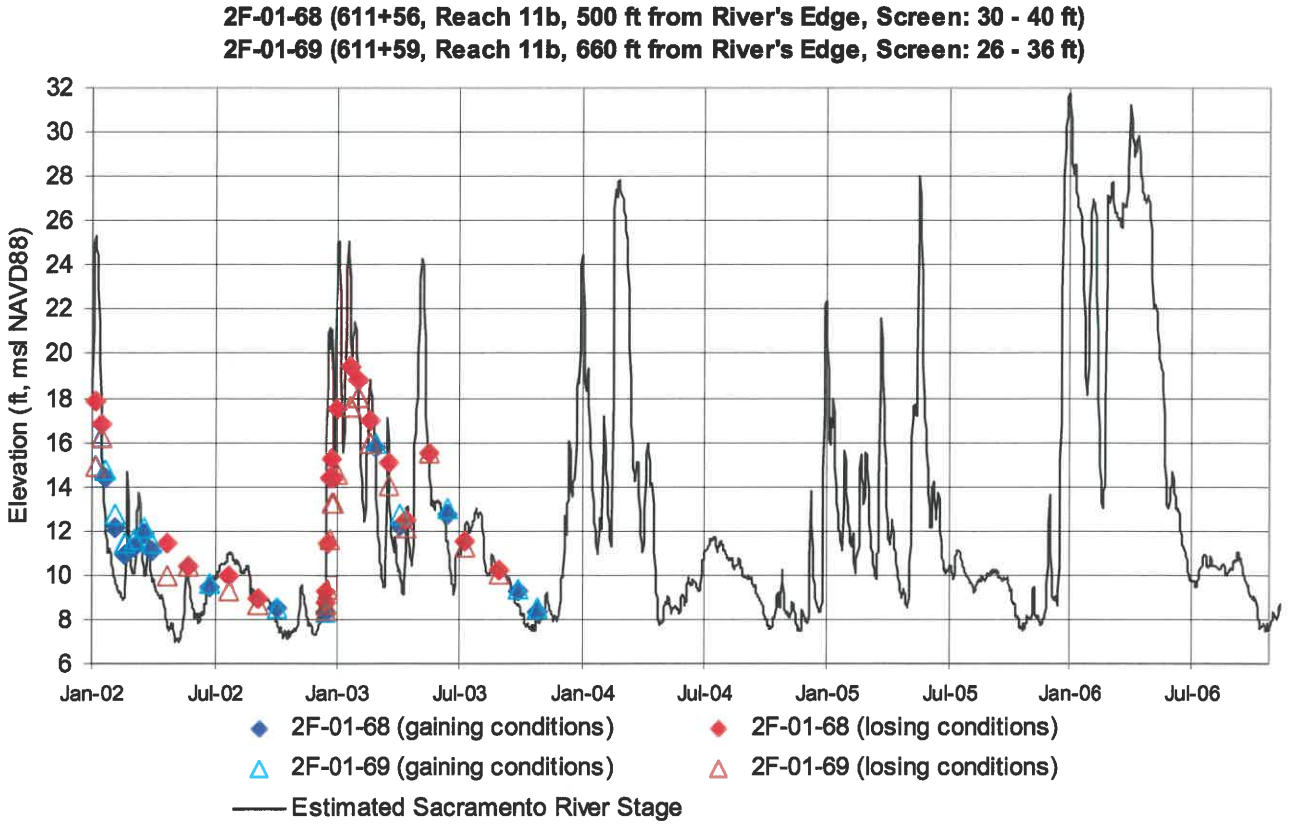


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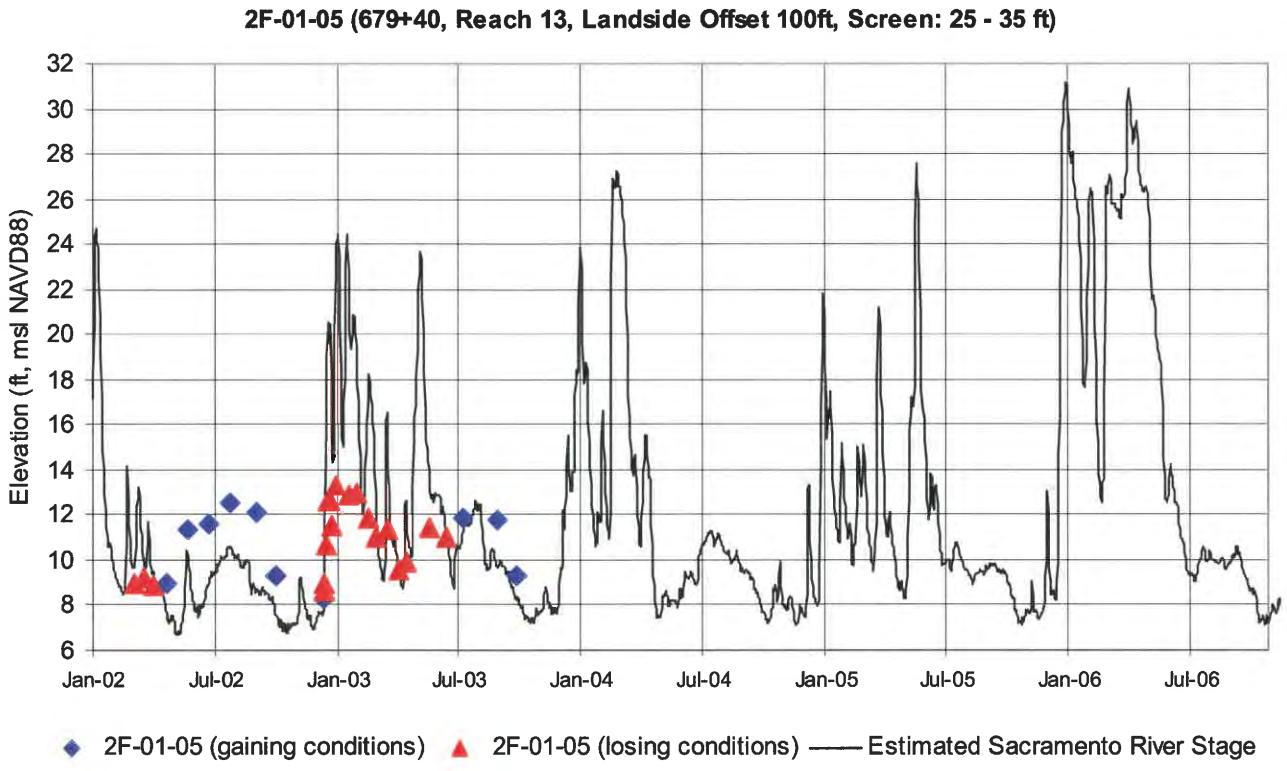
Figure 3-13
Hydrographs of Groundwater Elevations in Levee Piezometers and Estimated Stage in Reach 11b



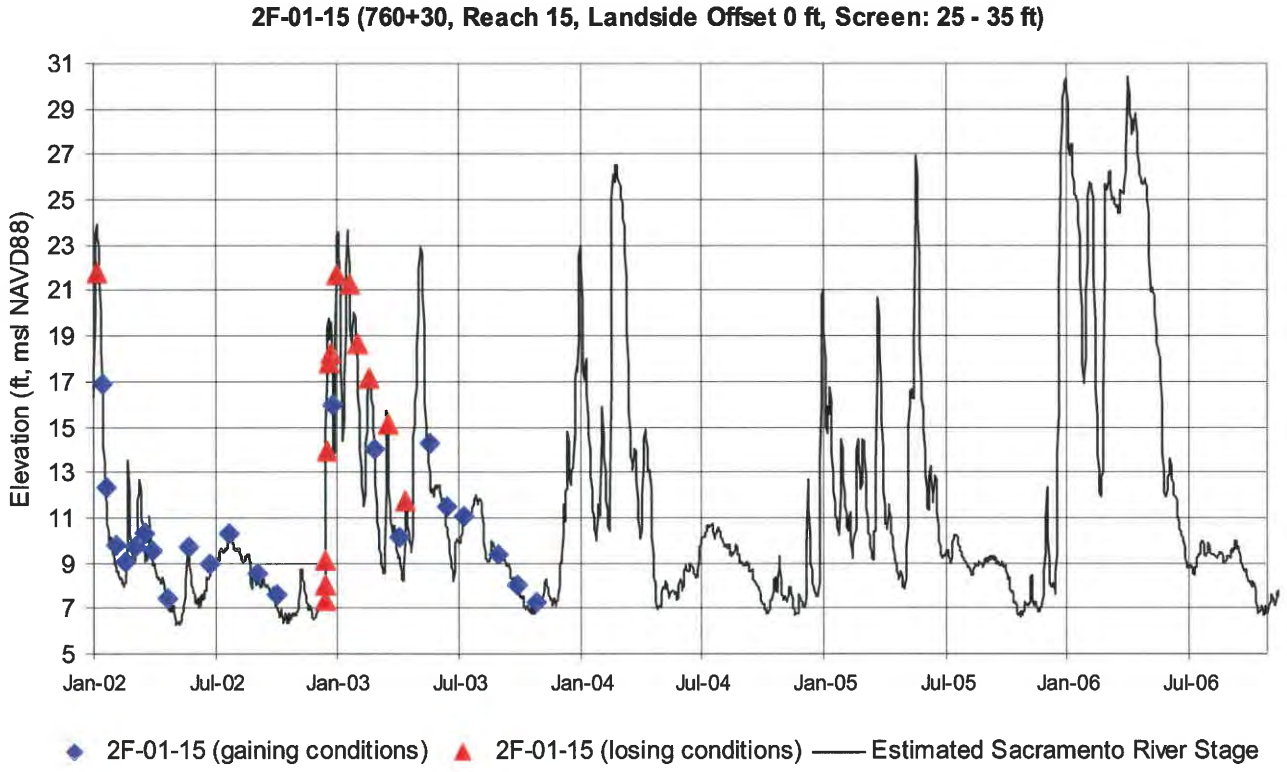


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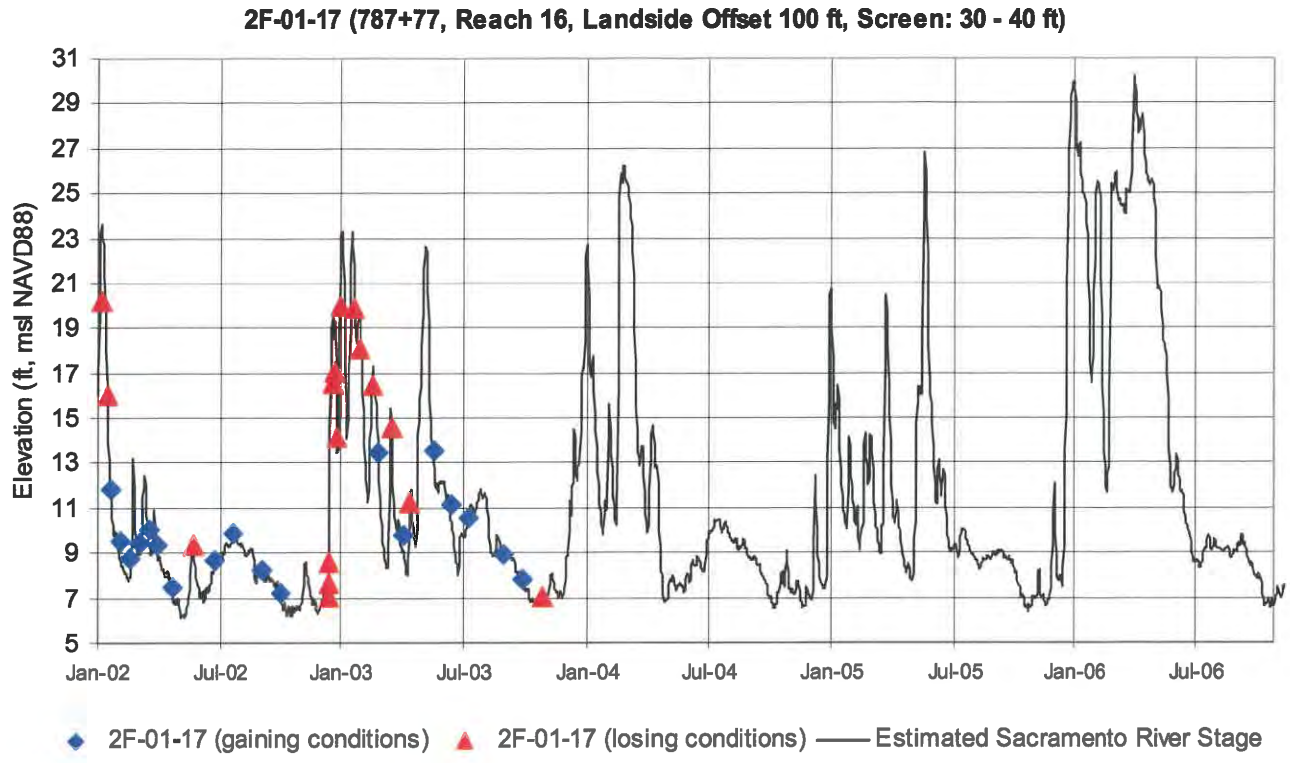
Figure 3-14
Hydrographs of Groundwater Elevations in Levee Piezometers and Estimated Stage in Reaches 13 and 15



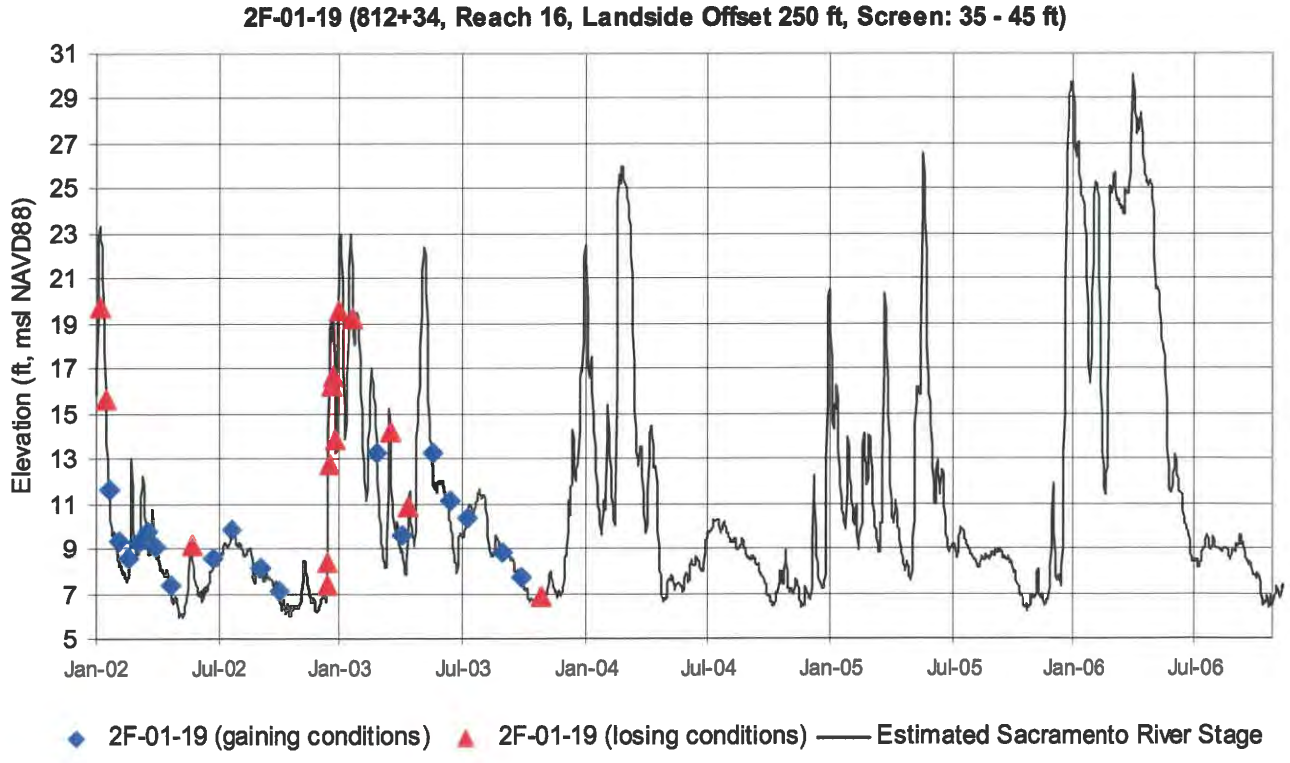


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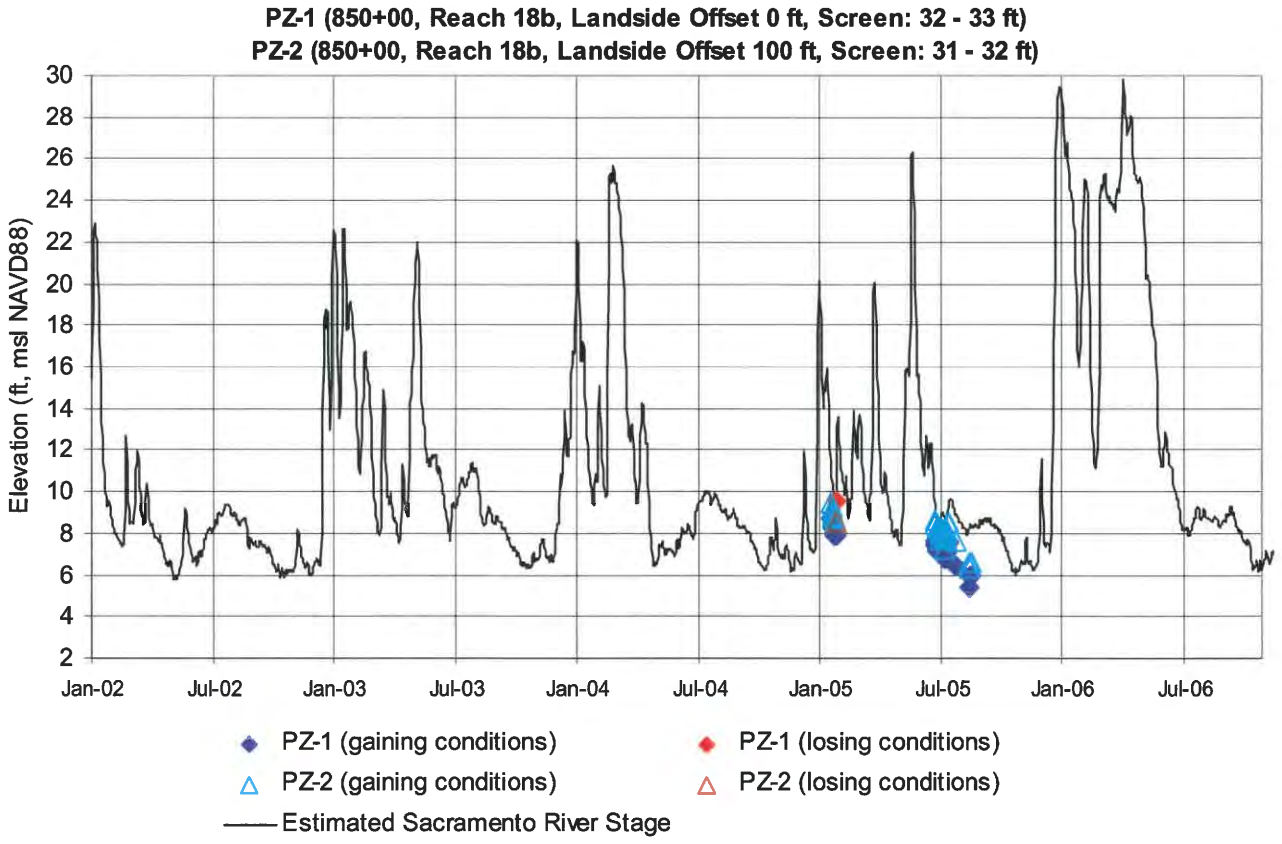
Figure 3-15
Hydrographs of Groundwater Elevations in Levee Piezometers and Estimated Stage in Reach 16



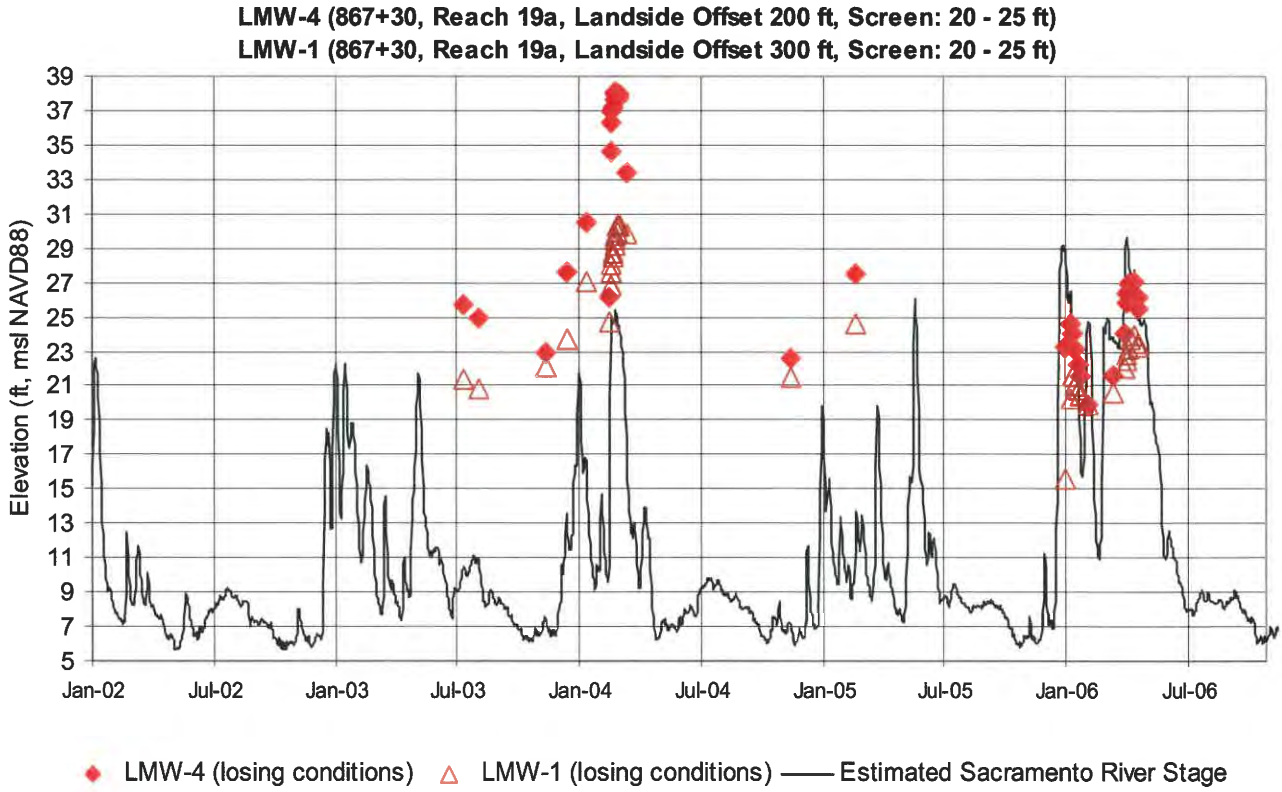


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Figure 3-16
Hydrographs of Groundwater Elevations in Levee Piezometers and Estimated Stage in Reaches 18b and 19a

4.0 Water Budgets for Existing and Future Groundwater Conditions in the Natomas Basin

4.1 IGSM Models

In order to evaluate the cumulative effects of SAFCA's proposed construction activities on groundwater conditions, a pair of existing numerical groundwater flow models were used to simulate groundwater conditions in the North American Subbasin and calculate groundwater budgets for the Natomas Basin. The models are based on the Integrated Groundwater and Surface Water Model (IGSM) platform developed by Montgomery Watson, Inc. (MW) in the 1990s. As discussed below, model results were used to calculate groundwater budgets for existing conditions (based on 2004) and future conditions (based on 2030).

The Sacramento County IGSM model is referred to as the SACIGSM and was originally developed by MW in 1993. The SACIGSM was updated by MW in 1995 and by WRIME in 2005, 2007, and 2008. The IGSM model for the Sutter/Placer County portion of the North American Subbasin is referred to as the North American River (NAR) IGSM and was originally developed by MW in 1995. The NARIGSM was subsequently updated by DWR (1997) and MW (2001). The grids used for both models are shown on **Figure 4-1**.

The IGSM models were updated most recently by WRIME in 2008 to reflect more current conditions in the Natomas Basin in order to simulate the groundwater impacts of the proposed Sutter Pointe Specific Plan development in southeastern Sutter County, which were summarized in the *Sutter Pointe Specific Plan Groundwater Supply Assessment* prepared by LSCE (2008b) . WRIME linked the NARIGSM and SACIGSM models and used them to simulate the effect of variations in the rate, timing, and location of pumping to supply the proposed Sutter Pointe development along with other land use and pumping projected for a 35-year simulation period that included different water year types.

IGSM is a finite element, quasi three-dimensional numerical groundwater flow model that simulates all major components of the hydrologic cycle. These include precipitation, runoff, evaporation, consumptive use, groundwater recharge, groundwater extraction and injection, and subsurface inflow and outflow along the model boundaries. As indicated in the model name, the simulation also includes interactions between surface water (streams and lakes) and groundwater. The primary components of the groundwater budget calculated by IGSM are:

Inflows

- Deep percolation from rainfall and irrigation applied water;
- Recharge due to stream seepage;
- Recharge from other sources such as irrigation canals and recharge ponds;
- Boundary inflows from outside the model area; and
- Subsurface inflows from adjacent model areas.

Outflows

- Groundwater pumping;
- Outflow to streams and rivers;
- Subsurface outflows to adjacent model areas; and
- Boundary outflows.

4.1.1 Sacramento County IGSM Model

The Sacramento County IGSM model covers most of Sacramento County and includes portions of northern San Joaquin County and western Amador County (**Figure 4-1**). The model is physically represented as a three-layer system consisting of the following layers: 1) the uppermost layer represents the unconfined or semi-confined aquifer system consisting of alluvial sediments that overlie the Mehrten Formation, 2) the middle layer represents the confined aquifer system of the Mehrten Formation, and 3) the lowermost layer represents groundwater of generally poorer quality in marine sediments underlying the Mehrten Formation. Near the southern boundary of the Natomas Basin, Layer 1 is about 200 feet thick and is overlain and underlain by aquitards with thicknesses of about 60 and 130 feet, respectively. Layer 2 starts at a depth of about 360 feet and is over 1,500 feet thick in this area. Layering of the SACIGSM model in the southern portion of the Natomas Basin is shown on **Figure 4-2** (see **Figure 4-1** for cross-section location). All groundwater pumping is simulated in the two upper layers.

Boundary conditions were established to designate heads for all boundary nodes and allow for surface and subsurface flows through the model boundaries. Boundary conditions reported by WRIME (2007) are as follows:

- The eastern boundary of the model is a no flow boundary but incorporates surface-water inflow to the model based on ungaged watersheds.

- General head conditions are used for the southern boundary (along the Mokelumne River). The heads for this boundary are obtained from the Stanislaus Basin IGSM, which has a simulation period ending in 1993, and values of head in nodes along this boundary in 1995 to 2004 use values from 1993.

- The western model boundary is along the Sacramento River. The northern section (north of Pocket Road) uses general head boundary conditions provided by the Central Valley IGSM (CVIGSM). The southern section of the western boundary (south of Pocket Road) is simulated as a constant head boundary. Both the general head and constant head conditions are interpolated from prior model nodes to the updated SACIGSM nodes for the western boundary. Because the general heads in the prior SACIGSM stop in 1995, the updated SACIGSM uses the 1995 values for subsequent years (1996 to 2004).

- General head conditions are used for the northern model boundary. These heads are provided by the NARIGSM, which was run concurrently with the SACIGSM. The linkage between the two models was done by correlating the boundary nodes of the models, updating the NARIGSM from monthly to daily time steps, and using the 1995 general heads in the NARISGM for subsequent years (1996 to 2004).

4.1.2 North American River IGSM Model

As shown on **Figure 4-1**, the NARIGSM includes the portions of eastern Sutter County and western Placer County that comprise the northern two-thirds of the North American Subbasin. This includes the Sutter County portion of the Natomas Basin. In 2001, the NARIGSM was refined to better assess groundwater impacts resulting from the water supply project and program alternatives being considered for the Regional Water Master Plan (MWH, 2001). The data sets that were updated included land use, streamflow, agricultural demand, surface-water diversions, urban water demand, groundwater pumping, precipitation, and groundwater levels.

The layering of the NARIGSM is similar to that of the SACIGSM. In the Sutter County portion of the Natomas Basin, Layer 1 extends from about 80 to 300 feet in depth and is overlain and underlain by aquitards. Layer 2 extends from about 420 to 1,400 feet in depth.

The boundaries for the NARIGSM were developed based on a combination of geological, hydrological, and political boundaries. MWH (1995) describes the original model boundaries as follows:

- The western model boundary is the Feather and Sacramento Rivers, which are an important source of recharge that create a groundwater divide in the upper aquifer system. General head conditions are used for this boundary based on the regional CVIGSM.

- The southern model boundary follows the Placer/Sacramento and Sutter/Sacramento County lines, and extends from the Sacramento River in the west to the eastern edge of the groundwater basin. This boundary is also the northern boundary of the SACIGSM. General head conditions are used for this boundary. As described above, the SACIGSM was linked to the NARIGSM to achieve consistent heads along this boundary.

- The eastern model boundary represents the geologic boundary between the Sacramento Valley Groundwater Basin and the Sierra Nevada foothills. No flow conditions are used for this boundary.

- The northern model boundary is the Bear River, which coincides with the Placer/Yuba and Sutter/Yuba County lines. General head conditions are used for this boundary based on the regional CVIGSM.

4.2 Model Inputs

Both the calibration and the future conditions simulations were run for a 35-year simulation period based on 1970-2004 hydrologic conditions. This was a period of approximately average precipitation, which included three single-dry years and three periods of multiple-dry years based on DWR's Sacramento River Basin Index. Initial conditions (starting heads) for the beginning of the calibration period were established using historical groundwater levels published by DWR to generate regional groundwater level contour maps and assign initial (September/October

1969) groundwater levels to each model node. Initial conditions for the 2030 simulation are discussed in Section 4.4 below.

The IGSM models simulate transient conditions whereby hydraulic heads and groundwater flow can vary with time. Discretization over time occurs by dividing the continuous simulation period into time steps. Both models originally used monthly time steps, but have since been updated to use daily time steps (WRIME, 2007). Some model inputs such as streamflow and precipitation are daily, while others such as surface-water deliveries and municipal and industrial (M&I) groundwater pumping are monthly. Agricultural water demands are estimated by the model based on historical crop acreage, soil moisture requirements, effective rainfall, potential evapotranspiration (ET), and irrigation efficiency.

The aquifer properties required by the model include hydraulic conductivity, storage coefficient, and specific yield for each layer. In the Natomas Basin, the hydraulic conductivity used for Layer 1 ranges from 33 to 118 ft/day across the Natomas Basin. Hydraulic conductivities are lower in Layer 2 (15-20 ft/day) and Layer 3 (3-12 ft/day).

Specific yield values used in the models range from 0.08 to 0.12 for the NARIGSM and from 0.04 to 0.20 for the SACIGSM. Storage coefficients in the Natomas Basin area ranged from 1.4 x 10^{-4} to 1.4 x 10^{-3} in Layer 1 to 3.5 x 10^{-5} to 3.0 x 10^{-4} in Layer 2, and 3.0 x 10^{-5} to 3.0 x 10^{-3} in Layer 3.

4.2.1 Simulation of Streams

To simulate streamflow, the IGSM models calculate a water balance for each stream element. The stream elements are a series of one-dimensional line elements that are used to describe the stream system in the model area. The gain or loss due to stream-aquifer interaction is computed based on head in the stream (stage) and head in the underlying aquifer (WRIME, 2006). The stream stage is computed using stage-discharge relationships at the corresponding stream node. Input data for the stream system include:

- Stream configuration;
- Stream node elevation;
- Stream channel cross section;
- Stage-discharge relationship;
- Stream inflows at boundary (including surface-water flow entering the model area and also gains or losses of the stream system due to stream-aquifer interaction);
- Tributary inflows;
- Wastewater discharges to streams; and
- Streamflow diversions that remove water from the stream system.

In the Natomas Basin, only the Sacramento and American Rivers are simulated as streams (recharge from smaller streams and canals is included in areal recharge estimate discussed below).

4.2.2 Areal Recharge

The IGSM models account for a number of processes in the soil zone, including ET, direct runoff, infiltration, and deep percolation from rainfall and applied water (WRIME, 2006). ET is computed based on crop consumptive use requirements and available soil moisture. Direct runoff from rainfall and applied water is computed using a modified Soil Conservation Service (SCS) runoff curve number method. Input data for simulation of hydrologic processes in the soil zone include (MW, 1995; WRIME, 2006):

- Initial soil moisture;
- Rainfall;
- Land use category;
- SCS hydrologic soil group;
- Minimum soil moisture requirements for each crop type;
- Crop consumptive use (amount of applied water consumptively used to satisfy ET or soil moisture requirements);
- Root zone depth for each crop; and
- Surface drainage pattern.

The two primary sources of water to the soil zone in agricultural and urban areas are precipitation and applied water. Agricultural areas in the NARIGSM area tend to have the largest amount of deep percolation due to the volume of irrigation water applied to rice fields in addition to the natural rainfall, while the amount of deep percolation from non-irrigated areas is relatively small (MW, 1995).

Water infiltrating beyond the soil zone (deep percolation) results in groundwater recharge. IGSM models simulate the vadose zone with the mathematical equation of unsaturated flow solved numerically at every time step (WRIME, 2006). The vadose zone is divided into a number of discrete layers of specified thickness; the water passing through the soil zone becomes the inflow to the uppermost vadose zone layer. This process repeats until the outflow from the last vadose zone layer becomes inflow to the first layer of the aquifer system. As discussed further in Chapter 5, deep percolation is a significant inflow component of the overall groundwater budget.

4.2.3 Model Calibration

Calibration is the process of adjusting parameters used in the model so that the model approximates the observed behavior of the aquifer system, especially measured groundwater levels. After the model is calibrated, it can be used to evaluate the response of the aquifer system to new or changing stresses. The original model calibration period for both IGSM models was water years 1970-1990. For the current versions of the models, the calibration period has been extended to water years 1970-1995 for the NARIGSM (MWH, 2001) and to 1970-2004 for the SACIGSM (WRIME, 2007).

During the calibration process, model generated heads were compared against measured water levels at selected calibration wells. In total, 81 calibration wells were used for the NARIGSM,

and 138 wells were used for calibration of the SACIGSM. The models were found to generally produce simulated water levels that were in good agreement with observed values under various hydrologic conditions. For the northern portion of the SACIGSM model, including the Sacramento County portion of the Natomas Basin, WRIME (2007) reported that 76 percent of the simulated heads fell within ten feet of observed heads.

Since they were last calibrated (2001 for the NARIGSM and 2007 for the SACIGSM), a number of changes have been made to both models. A check of the calibration was performed in fall 2007 after the refinement of the hydraulic conductivity values in the Natomas Basin to match recent aquifer test data provided by LSCE. Additional updates and refinements were made to the models through late 2007 and early 2008, but were considered to have only a minor effect on the calibration.

Since the models are an approximation of the physical system, they do not exactly reproduce observed groundwater levels. Although the calibration was considered acceptable for the primary intended purpose of the model (regional planning), there are notable differences between measured and simulated heads in the Natomas Basin. In particular, calibration hydrographs included in LSCE (2008b) and WRIME (2007) show declining heads at some of the Natomas Basin calibration wells over the 1970-2004 period. This is not supported by actual data, which generally show stable or increasing water levels since the early 1980s except for small seasonal fluctuations.

4.3 Water Budget for Existing Conditions

The groundwater budget for existing conditions in the Natomas Basin is based on the final water year of the 1970-2004 calibration period for the SACIGSM model. For the NARIGSM model, the calibration period ended in 1995, but the simulation period was extended to 2004 to create the water budget. Although a number of other IGSM simulations have been conducted for different purposes, the calibration period simulation was considered the best available representation of existing groundwater conditions in the Natomas Basin.

The groundwater budget for the end of the calibration simulation (2004) is shown in **Table 4-1** and summarized below The results are grouped into inflow and outflow components, and the change in storage represents the difference between the inflow and outflow.

Inflow Components

- Deep Percolation – This includes infiltration from precipitation, applied irrigation water, seepage from ditches and canals, and recharge from smaller streams. Deep percolation is assumed to be greatest from agricultural land planted to rice. A deep percolation rate of 1.32 acre-feet per acre per year (af/ac/yr), not including precipitation, was estimated for rice in the Natomas Basin (WRIME, 2008). The simulated deep percolation shown in **Table 4-1** totaled 31,429 af in 2004.

- Net Recharge from Streams – The direction of flow between streams and the underlying aquifer can vary seasonally or by reach. Flow from a stream to the aquifer system (losing

conditions) is classified as inflow to the groundwater basin, and flow from the aquifer system to a stream (gaining conditions) is classified as outflow. For the Natomas Basin, only flow to and from the Sacramento and American Rivers is included in this component. Although there is some seasonal variation, all reaches of the Sacramento and American Rivers were simulated as losing in 2004. The simulated net recharge from streams shown in **Table 4-1** was 6,469 afy for the Sacramento River and 1,086 afy for the American River.

- Net Boundary Inflow – This represents groundwater inflow or outflow through model boundaries. The Sacramento River forms the western boundary of both IGSM models, and positive values of boundary inflow represent groundwater flow from the west beneath the Sacramento River. Boundary inflow from the west shown in **Table 4-1** totaled 10,365 afy. Available water level data do not show a noticeable gradient for significant groundwater flow beneath the Sacramento River from the west. Therefore, some of this boundary inflow, especially that which occurs in Layer 1, may actually represent additional recharge from the Sacramento River.

- Subsurface Inflow – This component represents groundwater inflow from one model subregion to another. As shown in **Table 4-1**, there is a small amount of inflow from the north beneath the NCC (241 afy) and a larger amount of inflow from the south beneath the American River (2,714 afy).

Outflow Components

- Subsurface Outflow – This component represents groundwater outflow from one model subregion to another. For the 2004 simulation, there was a large amount of outflow from the Natomas Basin to the east (21,738 afy), as shown in **Table 4-1**.

- Groundwater Pumping – This represents the largest outflow component and, in the Natomas Basin, is primarily for agricultural use. The simulated groundwater pumping shown in **Table 4-1** is 35,537 afy.

Change in Storage

- Change in Storage – The basic equation for a water budget is:

  Inflow – Outflow = Change in Storage.

  A positive change in storage indicates rising groundwater levels while a negative change in storage indicates declining groundwater levels. As discussed above, hydrographs indicate that groundwater levels in the Natomas Basin are generally stable but show small fluctuations in response to climatic conditions. 2004 was classified as a normal year based on DWR's Sacramento River Basin Index, but precipitation in the Sacramento area was slightly below average. The simulated change in storage shown in **Table 4-1** is –4,971 afy.

This reduction in groundwater storage means that simulated heads were declining at the end of the calibration simulation. A decline in groundwater storage of almost 5,000 afy divided by the area of the Natomas Basin represents a small decrease in storage on a per acre basis (less than 0.1 af/ac/yr). As discussed above, the specific yield used in the model ranges from 0.04 to 0.20. Assuming a specific yield of 0.10, the simulated decrease in storage equates to an average decrease in head of about one foot.

4.4 Simulation of Future Conditions

The water budget for future conditions discussed below is based on a simulation conducted by WRIME to estimate the effect of proposed land and water use changes due to proposed developments in the North American Subbasin on groundwater conditions in 2030. For this scenario, the IGSM models were run for a 35-year simulation period based on 1970-2004 hydrologic conditions. As discussed above, this was a period of approximately average precipitation, which included three single-dry years and three periods of multiple-dry years based on DWR's Sacramento River Basin Index. This simulation represents proposed future land and water uses in the Natomas Basin, including the Sutter Pointe development at buildout (labeled Scenario 2B in LSCE, 2008b).

The 2030 simulation is based on estimated conditions in the groundwater basin in 2030 without SAFCA's construction activities. Future water supply conditions for northern Sacramento County were primarily based on Urban Water Management Plans for individual water districts in the area. As reported by WRIME (2007), most of the plans indicate a significant transition from groundwater to surface-water utilization to meet municipal water demands. Future water supply conditions for Placer County were based on several sources including the *Western Placer County Groundwater Management Plan* prepared by MWH (2007) on behalf of the City of Roseville, City of Lincoln, Placer County Water Agency, and California American Water. Water demand and supply data for proposed developments such as Placer Vineyards and Placer Ranch were obtained from the Specific Plan, EIR, or Notice of Preparation for each development.

The 2030 water budget presented below is based on Scenario 2B in LSCE (2008b), which includes full buildout of the Sutter Pointe development along with the other developments in the North American Subbasin discussed above. All agricultural land uses in the proposed development areas are simulated as being replaced by M&I land uses by 2030. Groundwater usage in the Sutter Pointe area is projected to be 13,072 afy in a normal year, which represents about 52 percent of the total demand M&I water demand, with the remainder supplied by surface water.

4.4.1 Water Budget for Future Conditions

The groundwater budget for the simulation of future conditions (2030) without SAFCA's planned construction is shown in **Table 4-1**. The future conditions water budget is based on the last 23 years of the simulation period (1982-2004). Precipitation during this period was approximately average, and this period includes nine wet years, four normal years, two single-dry years, and two multiple-dry periods (1987-1992 and 2001-2002) based on the Sacramento River 40-30-30 Index.

There are significant differences between the water budgets for the 2004 and 2030 simulations shown in **Table 4-1**. Many of these differences are due to much higher heads east of the Natomas Basin in 2030 due to the planned transition from groundwater to surface water to meet M&I demands in northern Sacramento County. Heads are also higher in most of the Natomas Basin due in part to reduced pumping outside of the Sutter Pointe area. Higher heads result in less recharge from streams, less boundary inflow, and less subsurface outflow for the Natomas Basin water budget.

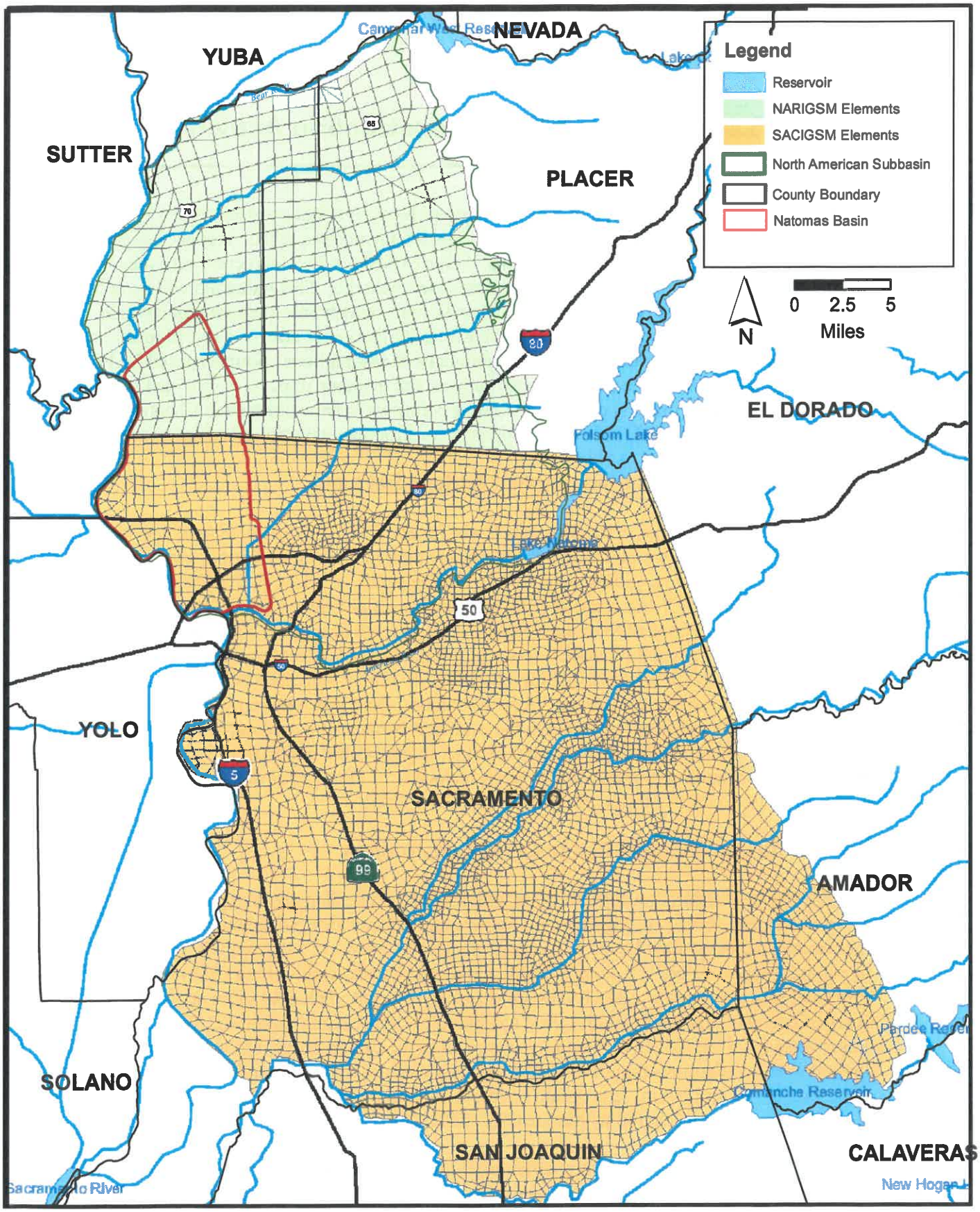
There are also differences between the values shown in **Table 4-1** for the 2030 simulation and the Scenario 2B results summarized in LSCE (2008b). These differences occurred because the latter simulation included an area of about 1,000 acres east of the Natomas Basin in southern Sutter County, which was removed from the area used for the water budget in **Table 4-1**. Due to the additional area, deep percolation and groundwater pumping were 2,300 and 3,000 afy higher, respectively, for the Scenario B water budget (LSCE, 2008b).

The inflow components shown in **Table 4-1** are deep percolation (27,187 afy), which represents a reduction of 4,242 afy from 2004 due to increased urbanization. Recharge from streams is 1,100 afy for the Sacramento River and –500 afy for the American River. The negative recharge for the American River indicates that it is simulated as a gaining reach for this model run. The total net recharge from streams (600 afy) is 6,955 afy lower than for the 2004 simulation. Boundary inflow from the west in 2030 (3,700 afy) is 6,665 afy lower than in 2004. Subsurface inflow from the north (3,700 afy) is 745 afy higher, however, due primarily to drawdown caused by proposed Sutter Pointe pumping in southern Sutter County. The 2030 simulation also shows only 1,200 afy of subsurface outflow to the east (20,538 afy less than in 2004) and 800 afy of subsurface outflow to the south due to expected pumping reductions in the southern portion of the Natomas Basin. The total pumpage in the 2030 simulation is 31,615 afy, which is 3,922 afy lower than in 2004. The average change in storage was 1,572 afy, which indicates generally increasing heads over the simulation period.

Table 4-1
Simulated Groundwater Budgets for Natomas Basin
(Not Including SAFCA Activities)

	Water Budget Component	2004 Simulation[1] (afy)	2030 Simulation[2] (afy)	Difference (afy)
Inflow	Deep Percolation (Including Canal Seepage)	31,429	27,187	4,242
	Recharge from Sacramento River	6,469	1,100	5,369
	Recharge from American River	1,086	-500	1,586
	Boundary Inflow from West	10,365	3,700	6,665
	Subsurface Inflow from North	241	3,700	-3,459
	Subsurface Inflow from South	2,714	0	2,714
	Total Inflow	**52,304**	**35,187**	**17,117**
Outflow	Groundwater Pumping	35,537	31,615	3,922
	Subsurface Outflow to East	21,738	1,200	20,538
	Subsurface Outflow to South	0	800	-800
	Total Outflow	**57,275**	**33,615**	**23,660**
Inflow minus Outflow	**Change in Storage**	**-4,971**	**1,572**	**-6,543**

1. Based on final year of calibration simulation (LSCE, 2008b).
2. Based on 1982-2004 average for Sutter Pointe Project Scenario 2B (LSCE, 2008b).



FILE: C:\Temp\SAFCA\Figure 7-1 Model Grids.mxd Date: 8/6/2008

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Figure 4-1
Model Grids for SACIGSM and NARIGSM Groundwater Flow Models

5.0 Effects of SAFCA Construction Activities

Most of SAFCA's proposed levee improvements will have no effect on groundwater in the Natomas Basin, but the proposed slurry cutoff walls are intended to reduce seepage beneath the levees and will affect groundwater conditions. Some of SAFCA's construction activities will involve land use changes that will reduce groundwater recharge. This reduction will be at least partially offset by seepage from new and relocated canals, which will increase groundwater recharge. Finally, water supply changes at the Brookfield property borrow site will result in a large reduction in groundwater pumping. A summary of assumptions about proposed SAFCA construction activities used to prepare water budgets and evaluate impacts is provided in **Table 5-1**. The groundwater impacts of proposed slurry cutoff walls are addressed in Chapter 6; the groundwater impacts of SAFCA's other proposed construction activities are summarized below.

5.1 Deep Percolation from Irrigated Agricultural Land

Most groundwater recharge in the Natomas Basin results from deep percolation of applied irrigation water. As shown in **Table 5-2**, estimates of applied water for various crops range from 2.5 af/ac/yr for field crops, grains, and hay to 6.5 af/ac/yr for rice (LSCE, 2008b). Most of this water is consumed by ET but some goes to tailwater runoff and deep percolation. The amount of deep percolation is estimated to range from about ten percent of applied water for field crops (0.25 af/ac/yr) to 17 percent of applied water for orchards (0.68 af/ac/yr). These estimates represent deep percolation from irrigation only; they do not include deep percolation from direct precipitation in the winter and spring. Deep percolation from precipitation was estimated to be about 0.23 af/ac/yr and is not included in the estimates because it would occur regardless of land use (except for areas covered by pavement or other impermeable materials). Estimates of deep percolation from applied water for other crops include 0.77 af/ac/yr for rice, 0.41 af/ac/yr for grains and hay, and 0.61 af/ac/yr for pasture (LSCE, 2008b).

5.2 Land Use Changes Due to Levee Construction

Proposed levee construction activities that will affect land use include raising levees, modifying levee slopes, and adding seepage berms. As summarized in **Table 5-1**, planned improvements to the Sacramento River East Levee will require about 486.5 acres of land and will result in the loss of about 20 acres of rice, 175 acres of field crops, and five acres of orchard (EDAW, 2008). Proposed improvements to other levees are expected to result in the loss of an additional five acres of rice along the NCC South Levee and 50 acres of rice along the PGCC West Levee. Improvements to the NEMDC West Levee are still in the design phase, but irrigated crop land is limited to the northern portion of this levee and any changes in agricultural land use are expected to be small. No agricultural land would be affected by improvements to the American River North Levee, which is located within the City of Sacramento.

Table 5-3 shows existing and future agricultural land uses affected by proposed levee improvements and the resulting change in deep percolation from applied water. The estimated

loss of deep percolation is 74 afy for the Sacramento River East Levee, seven afy for the NCC South Levee, and 66 afy for the PGCC West Levee.

5.3 Effects of Canal Improvements

Construction of the new GGS/Drainage Canal and relocation/improvement of three existing canals will increase groundwater recharge in the Natomas Basin. The new GGS/Drainage Canal and most of the relocated canals will be unlined, which will result in additional seepage from the canals to the underlying aquifer. Canal construction activities will also necessitate land use changes, including the loss of some irrigated agricultural land. The assumptions shown in **Table 5-1** were used to estimate the effects of land use changes and seepage from the canals for the water budget. For canals that would be relocated, this includes the total length of the existing and relocated canals, the length of any lined or piped segments, the approximate width of the canals at the waterline, existing land uses for the area where the relocated canal would be constructed, and the proposed future land uses for the existing canal that would be removed.

5.3.1 Giant Garter Snake/Drainage Canal

The new GGS/Drainage Canal will be about 23,200 feet (4.4 miles) long and will extend from the west end of the West Drainage Canal at the south to Pumping Plant No. 2 (east of the Pritchard Lake Pumping Plant) at the north (**Figure 1-1**). The new canal will be entirely unlined, with an average width at the waterline of about 50 feet including benches.

Construction of the GGS/Drainage Canal and associated infrastructure will require about 58.5 acres of land, as indicated in **Table 5-1**. Approximately 45 acres of this area is currently planted to field crops such as corn (EDAW, 2008). As shown in **Table 5-3**, the total amount of deep percolation that will be lost due to the removal of these field crops is estimated to be 11 afy.

The loss of deep percolation of applied water would be offset by increased seepage from the canal. Kleinfelder (2009) used the SEEP/W groundwater flow model to estimate seepage from a two-mile segment of the new GGS/Drainage canal. The canal was simulated with a ten-foot width and an underlying soil hydraulic conductivity of 10^{-5} cm/sec. The canal was simulated as being filled with about five feet of water from May through December, but some seepage was also assumed to occur during the winter. The Kleinfelder seepage estimate was 1.4 af/1,000 lf or 1.4×10^{-4} af per square foot of wetted canal area (af/ft^2). For the total length (23,200 lf) and average width (50 feet) of the GGS/Drainage Canal, this represents a seepage rate of 162 afy, as shown in **Table 5-4**. As discussed below, the estimated seepage rate per wetted area (1.4×10^{-4} af/ft^2) was also used to estimate increased seepage due to relocation or improvement of the West Drainage Canal, the Elkhorn Canal, and the Riverside Canal.

5.3.2 West Drainage Canal

The West Drainage Canal is located south of I-5 and the SIA (**Figure 1-1**) and is about 19,000 feet long. Approximately 4,700 lf of this canal is proposed to be relocated. The existing canal is unlined, and the relocated segment of the canal is also planned to be unlined. In addition to the partial relocation, SAFCA plans to widen the entire canal from about 30 feet to 72 feet, including a bench area that will be planted to tules (EDAW, 2008; M&H, 2008). As shown in **Table 5-1**,

only about 1.5 acres of the area where the relocated canal will be constructed is currently planted to field crops. The loss of deep percolation from applied water due to the canal relocation is estimated to be 0.4 afy (**Table 5-3**).

Canal seepage was estimated using the seepage rate calculated from the Kleinfelder model for the GGS/Drainage Canal (1.4×10^{-4} af/ft^2). As shown in **Table 5-4**, seepage from the existing West Drainage Canal was estimated to be about 80 afy. Due to lengthening and widening of the canal, the future seepage rate is projected to be 208 afy, which represents an increase of 128 afy.

5.3.3 Elkhorn Canal

The existing Elkhorn Canal is located just east of the Sacramento River East Levee (**Figure 1-1**) and is about 19,850 feet (3.8 miles) long and 16 feet wide. Approximately one mile of the existing canal is concrete lined. The canal is being relocated farther east to make room for levee widening and other improvements. The relocated canal will be about 22,300 feet long and 32 feet wide. Approximately 6,100 lf of the relocated canal are planned to be lined, and another 2,950 lf would be piped. This includes the 2,050 lf alignment crossing the Teal Bend Golf Course and another 900 lf adjacent to an area of existing homes (M&H, 2008).

As shown in **Table 5-1**, relocation of the Elkhorn Canal and associated infrastructure will require about 30 acres of land. Most of the area where the new canal will be constructed is currently planted to irrigated crops. As shown in **Table 5-3**, there are about 15 acres of field crops, three acres of orchard, and 11 acres of grain, hay, and pasture. The loss of deep percolation due to removal of these crops is estimated to be 11 afy.

Canal seepage was estimated similarly to the West Drainage Canal, using the seepage rate calculated from the Kleinfelder model for the GGS/Drainage Canal (1.4×10^{-4} af/ft^2). As shown in **Table 5-4**, seepage from the existing Elkhorn Canal was estimated to be about 33 afy. The seepage rate of the relocated canal is projected to be 59 afy, which represents an increase of 27 afy.

5.3.4 Riverside Canal

The existing Riverside Canal is located just east of the southern portion of the Sacramento River East Levee in the Natomas Basin (**Figure 1-1**) and is about 19,600 feet (3.7 miles) long and seven feet wide. The Riverside Canal is also being relocated farther east to make room for levee improvements. The relocated canal is planned to be about 20,550 feet long and ten feet wide (M&H, 2008).

As shown in **Table 5-1**, relocation of the Riverside Canal and associated infrastructure will require about 54 acres of land. Most of the area where the new canal will be constructed is currently planted to irrigated crops. As shown in **Table 5-3**, there are about four acres of rice, 33 acres of field crops, six acres of orchard, and seven acres of grains, hay, and pasture. The loss of deep percolation due to removal of these crops is estimated to be 21 afy.

Canal seepage was again estimated using the seepage rate calculated from the Kleinfelder model for the GGS/Drainage Canal (1.4×10^{-4} af/ft^2). As shown in **Table 5-4**, seepage from the

existing Riverside Canal was estimated to be 19 afy. The seepage rate of the relocated canal is projected to be 29 afy, which represents an increase of ten afy.

5.4 Effects of Borrow Sites

Excavation of the three borrow sites that will be the primary source of soil for SAFCA's proposed levee improvements and other construction activities will have effects on groundwater recharge in the Natomas Basin. **Table 5-1** includes a summary of assumptions about the borrow sites that were used for water budget estimates. These include the area of each borrow site and existing and proposed future land uses.

5.4.1 Airport North Bufferlands

The Airport North Bufferlands is a 737-acre site located north of the SIA (**Figure 1-1**). Approximately 630 acres of this site that had previously been planted to rice has recently been removed from rice cultivation or other land uses that would attract water fowl by the SIA. SAFCA plans to remove about four to six feet of borrow material from this site, which is currently considered non-irrigated grassland. Topsoil will be stockpiled and replaced after borrow operations are complete, and future land uses are not expected to change after reclamation of the site. As shown in **Table 5-3**, there will be no change in deep percolation from this site as a result of SAFCA's activities.

5.4.2 Brookfield Property

The Brookfield property consists of 353 acres at the northern tip of the Natomas Basin. Approximately 325 acres of this property is currently planted to rice, and SAFCA plans to restore most of this site to rice cultivation. Up to six feet of soil will be excavated, including one foot of topsoil that will be stockpiled and replaced after borrow operations are complete.

SAFCA plans to return about 286 acres of the Brookfield property to rice cultivation after construction activities are complete. The remaining 39 acres of rice fields would be lost due to construction along the PGCC West Levee and other factors. As shown in **Table 5-3**, an estimated 51 afy of deep percolation will be lost due to the conversion of rice land to other uses. The Brookfield property is currently irrigated entirely with groundwater, but SAFCA plans to provide the infrastructure so that most of the borrow site can be irrigated with surface water in the future. Engineering work is still in progress, but current estimates are that about 80 percent of the property would be irrigated with surface water rather than groundwater after reclamation (M&H, 2008). The current crop mix is about 50 percent regular rice and 50 percent wild rice (Jack DeWit, pers. comm., July 8, 2008). Regular rice and wild rice have estimated water demands of 6.5 and 6.0 af/ac/yr, respectively. Therefore, current groundwater pumpage to irrigate this property is estimated to be about 2,030 afy. This would be reduced by 1,625 afy due to the planned transition from groundwater to surface water.

In addition to increasing heads in the vicinity of the Brookfield site, the reduction in pumping would also result in increased groundwater outflow from the northern portion of the Natomas Basin. An analytical groundwater model based on the Theis (1935) equation for groundwater flow in a confined aquifer was used to estimate the amount of water level recovery that would

occur due to the reduced pumping. An aquifer transmissivity of 7,620 ft^2/day and a storage coefficient of 0.001 were used for this simulation based on LSCE (2008b). The maximum simulated water level recovery beneath the Brookfield property was about 17 feet at the end of the irrigation season in September. At the midpoint of the PGCC West Levee (south of the Brookfield property), the simulated recovery ranged from 1.6 to 7.6 feet, with an average annual value of 3.8 feet. This would result in an average increase in the hydraulic gradient for flow to the east of about 4.4×10^{-5} ft/ft. The increase in subsurface outflow was estimated using Darcy's Law (Darcy, 1856), which can be written as:

$$Q = KAi$$

where:
Q = volumetric flow rate,
K = hydraulic conductivity of the porous medium,
A = cross-sectional area of the porous medium, and
i = hydraulic gradient.

The cross-sectional area was estimated based on the assumption that almost all of the flow would occur in the upper 400 feet of the aquifer system. Using this equation, the increase in subsurface outflow from the Natomas Basin was predicted to be 76 afy.

5.4.3 Fisherman's Lake

Fisherman's Lake – The Fisherman's Lake borrow site is located at the northern end of Fisherman's Lake in the southwestern portion of the Natomas Basin. Engineering work has not been completed for this site, but the current estimate is that about 400 acres of land would be used for borrow material.

As shown in **Table 5-1**, current land uses on this site are 49 acres of rice, 266 acres of field crops, and 85 acres of managed marsh. After reclamation, there would be about 175 acres of managed marsh and 225 acres of non-irrigated grassland or woodland. As shown in **Table 5-3**, the creation of managed marsh will result in an increase in deep percolation of 51 afy. Overall, however, there will be a net loss in deep percolation of 15 afy due to the conversion of field crops to non-irrigated grassland.

5.5 Summary

This chapter summarized the groundwater impacts of SAFCA's proposed construction activities, with the exception of slurry cutoff walls, which are addressed in Chapter 6. The above analysis included three types of groundwater impacts:

- Land use changes due to levee and canal improvements and borrow sites will result in the conversion of some irrigated agricultural land to non-irrigated land uses, which will reduce groundwater recharge from deep percolation of applied water. The total loss of deep percolation from applied water is estimated to be 256 afy, as shown in **Table 5-3**.
- The new and relocated canals would result in increased groundwater recharge due to additional canal seepage. The total estimated increase in canal seepage is 327 afy, as shown in **Table 5-4**.

- There will be a large reduction in groundwater pumping due to the planned shift in water supply from groundwater to surface water for 80 percent of the Brookfield property. The reduction in pumping is estimated to be about 1,625 afy. This will result in higher heads and increased groundwater outflow in the northern portion of the Natomas Basin.

Table 5-1
SAFCA Construction Assumptions for Water Budget Estimates

	Total Length (ft)	Slurry Cutoff Walls		Canals		Total Area (ac)	Existing Agricultural Land Uses	Future Land Uses	Notes/Sources
		Length (ft)	Average Depth (ft)	Length of Lined or Piped Segments (ft)	Average Width at Waterline (ft)				
Levees									
Sacramento River East Levee	96,000	53,450	65	-	-	486.5	20 ac rice, 175 ac field crops, 5 ac orchard	Levee	HDR (April 17, 2009); Land use based on EDAW Table 3
NCC South Levee	28,700	28,700	70	-	-	148.5	5 ac rice	Levee	Kleinfelder (2008), Land use based on EDAW Table 3
PGCC West Levee	17,400	14,010	38	-	-	89.5	50 ac rice	Levee	Wood Rodgers (2009), land use based on EDAW Table 3
NEMDC West Levee (North)	35,700	22,840	37	-	-	-	South NEMDC - none; North NEMDC - unknown	Levee	Wood Rodgers (2009)
NEMDC West Levee (South)	31,900	23,100	45	-	-	-	South NEMDC - none; North NEMDC - unknown	Levee	Wood Rodgers (2009)
American River North Levee	11,600	11,560	55	-	-	-	None	Levee	HDR (April 17, 2009)
Canals									
GGS/Drainage Canal	23,200	-	-	0	50	58.5	45 ac field crops	-	Width (M&H, 7-15-08); Land use based on EDAW Table 3
West Drainage Canal (Existing)	19,000	-	-	0	30	7	-	Managed grassland	4,700 LF section to be relocated
West Drainage Canal (Relocated)	20,600	-	-	0	72	8	1.5 ac field crops	-	Relocated section = 6,300 LF, rest widened to 72 ft.
Elkhorn Canal (Existing)	19,850	-	-	5,280	16	30	-	Levee	Length & width (M&H, 7-15-08)
Elkhorn Canal (Relocated)	22,300	-	-	9,050	32	34	15 ac field crops, 3 ac orchard, 11 ac other	-	Land use estimated by LSCE based on 2004 land use map from LSCE (2008b)
Riverside Canal (Existing)	19,600	-	-	0	7	50	-	Levee	
Riverside Canal (Relocated)	20,550	-	-	0	10	54	12 ac rice, 102 ac field crops, 17 ac orchard, 24 ac other	-	Land use estimated by LSCE based on 2004 land use map from LSCE (2008b)
Borrow Sites									
Airport North Bufferlands	-	-	-	-	-	737	Previously planted to rice but currently non-irrigated at request of FAA.	Managed grassland	Acreage (M&H, 7-15-08); current land uses per SAFCA
Brookfield Property	-	-	-	-	-	353	325 ac rice irrigated w/ 100% groundwater (1/2 & 1/2 reg. & wild rice)	286 ac rice irrigated w/ 20% groundwater, 80% surface water	Assumption of 286 ac in rice in future based on work on adjacent PGCC west levee (M&H, 2008)
Fisherman's Lake	-	-	-	-	-	400	49 ac rice, 266 ac field crops, 85 ac marsh	175 ac managed marsh, 225 ac grass-land or woodland	Acreage, land use from Marieke Armstrong, M&H (7-18-08)

Table 5-2
Deep Percolation from Applied Water in the Natomas Basin

Crop	Applied Water[1] (af/ac/yr)	Deep Percolation from Applied Water[2]	
		(af/ac/yr)	(%)
Rice or managed marsh	6.5	0.77	12%
Field and Row Crops	2.5	0.25	10%
Orchard	4.0	0.68	17%
Grains and Hay	2.5	0.41	16%
Pasture	4.8	0.61	13%

1. Source: LSCE (2008b).
2. Source: LSCE 2008b. Estimated as total deep percolation minus deep percolation from precipitation.

Table 5-3
Effects of Land Use Changes Due to Proposed SAFCA Construction on Deep Percolation

SAFCA Construction Activity	Existing Agricultural Land Uses (ac)				Future Agricultural Land Uses (ac)		Loss of Deep Percolation from Applied Water (afy)				Total Loss of Deep Percolation from Applied Water (afy)
	Rice[1]	Field Crops	Orchard	Grains, Hay, and Pasture	Rice or Managed Marsh	Other	Rice[2]	Field Crops[3]	Orchard[4]	Grains, Hay, and Pasture[5]	
Levee Improvements:											
Sacramento River East Levee	20	175	5	0	0	0	15	44	3	0	63
NCC South Levee	5	0	0	0	0	0	4	0	0	0	4
PGCC West Levee	50	0	0	0	0	0	39	0	0	0	39
NEMDC West Levee[6]	0	0	0	0	0	0	0	0	0	0	0
American River North Levee	0	0	0	0	0	0	0	0	0	0	0
Subtotal	**75**	**175**	**5**	**0**	**0**	**0**	**58**	**44**	**3**	**0**	**105**
Canals:											
GGS/Drainage Canal	0	45	0	0	0	0	0	11	0	0	11
West Drainage Canal	0	1.5	0	0	0	0	0	0.4	0	0	0.4
Elkhorn Canal	0	15	3	11	0	0	0	4	2	5	11
Riverside Canal	4	33	6	7	0	0	3	8	4	3	19
Subtotal	**4**	**95**	**9**	**18**	**0**	**0**	**3**	**24**	**6**	**8**	**41**
Borrow Sites:											
Airport North Bufferlands	0	0	0	0	0	0	0	0	0	0	0
Brookfield Property	325	0	0	0	286	0	30	0	0	0	30
Fisherman's Lake	134	266	0	0	173	0	-30	67	0	0	36
Subtotal	**459**	**266**	**0**	**0**	**459**	**0**	**0**	**67**	**0**	**0**	**67**
Total	**538**	**536**	**14**		**459**	**0**	**61**	**134**	**10**	**8**	**213**

1. Includes 85 ac of managed marsh at the Fisherman's Lake borrow site.
2. Deep percolation from applied water estimated to be 0.77 af/ac/yr for rice and managed marsh by LSCE (2008b).
3. Deep percolation from applied water estimated to be 0.25 af/ac/yr for field crops by LSCE (2008b).
4. Deep percolation from applied water estimated to be 0.68 af/ac/yr for orchards by LSCE (2008b).
5. Deep percolation from applied water estimated to be 0.41 af/ac/yr for grains/hay and 0.61 af/ac/yr for pasture by LSCE (2008b). A weighted average of 0.47 af/ac was used above.
6. Design of NEMDC levee improvements is in the early stages, and there is no current estimate of land use changes due to levee constructiion. An estimate of 50 ac of rice based on the PGCC was also used for the NEMDC because land uses west of the northern portion of the NEMDC are similar to the PGCC. Land uses west of the southern portion of the NEMDC are urbanized or vacant.

Table 5-4
Effects of SAFCA's Proposed Canal Construction on Canal Seepage

Canal Name		Total Length (ft)	Length of Lined or Piped Segments (ft)	Length of Unlined Portion (ft)	Width at Waterline (ft)	Area at Waterline[1] (ft^2)	Seepage Rate per Sq. Foot[2] ($af/ft^2/yr$)	Total Seepage Rate (afy)	Seepage Increase (afy)
GGS/Drainage Canal	New	23,200	0	23,200	50	1,160,000	1.4E-04	162	162
West Drainage Canal	Existing	19,000	0	19,000	30	570,000	1.4E-04	80	
	Relocated	20,600	0	20,600	72	1,483,200	1.4E-04	208	128
Elkhorn Canal	Existing	19,850	5,280	14,570	16	233,120	1.4E-04	33	
	Relocated	22,300	9,050	13,250	32	424,000	1.4E-04	59	27
Riverside Canal	Existing	19,600	0	19,600	7	137,200	1.4E-04	19	
	Relocated	20,550	0	20,550	10	205,500	1.4E-04	29	10
Total	**Existing**	**58,450**	**5,280**	**53,170**		**940,320**		**132**	
	New or Relocated	**86,650**	**9,050**	**77,600**		**3,272,700**		**458**	**327**

1. Area of unlined portion only.
2. Based on results of Kleinfelder (2009) seepage model for portion of GGS/Drainage Canal.

6.0 Effects of Slurry Cutoff Walls

Slurry cutoff walls are currently proposed for a total of about 29 miles of the levees surrounding the Natomas Basin. This includes about ten miles of the Sacramento River East Levee, all (5.4 miles) of the NCC South Levee, 2.7 miles of the PGCC West Levee, 4.3 miles of the northern NEMDC West Levee, 4.1 miles of the southern NEMDC West Levee, and all (2.2 miles) of the American River North Levee. Proposed seepage mitigation including slurry cutoff walls is summarized in **Table 6-1** for the Sacramento River East Levee and in **Table 6-2** for the NCC South Levee, the PGCC West Levee, the NEMDC West Levee, and the American River North Levee. The proposed cutoff wall locations are shown on **Figure 6-1**.

Groundwater flow beneath the levees with and without the proposed cutoff walls was estimated by various methods. These methods and the resulting estimates are discussed in this section. Groundwater flow beneath the Sacramento River East Levee and the NCC South Levee with and without slurry cutoff walls was estimated by both URS and Kleinfelder using the SEEP/W groundwater flow model. The most recent estimates were made by Kleinfelder and are summarized below. LSCE used a spreadsheet model to develop a revised estimate for the Sacramento River East Levee.

No modeling has been done to estimate the impacts of proposed slurry cutoff walls along the other three levees that surround the Natomas Basin. For these areas, groundwater flow without slurry cutoff walls was estimated based on the IGSM models discussed in Chapter 4. Two different simulations were used for this purpose: one representing existing conditions based on 2004 data, and the other representing future conditions in 2030. Based on the model results, estimates of groundwater flow per cross-sectional area were developed. For the reaches where slurry cutoff walls are proposed, the estimated flow per cross-sectional area was reduced by a fixed percentage based on the Kleinfelder model results for the Sacramento River East Levee.

6.1 Sacramento River East Levee

Measures proposed to mitigate seepage problems beneath the Sacramento River East Levee are shown in **Table 6-1**. The current plan includes some form of mitigation for all reaches. Slurry cutoff walls are currently proposed for 13 reaches, seepage berms are proposed for 13 reaches, relief wells are proposed for ten reaches, and jet grouting is proposed at one reach. The reaches where cutoff walls are proposed are shown in **Figure 6-1**.

6.1.1 Kleinfelder Model

Kleinfelder (2009) used the SEEP/W groundwater flow model to estimate seepage beneath the Sacramento River East Levee with and without slurry cutoff walls and summarized the results in a report entitled *Evaluation of Cutoff Walls Impact on Groundwater Recharge, Sacramento River East Levee, Natomas Levee Improvement Project, Sacramento and Sutter Counties, California.* SEEP/W is a two-dimensional, finite-element model based on Darcy's Law (Darcy, 1856). As discussed in Chapter 5, the inputs to Darcy's equation are the hydraulic conductivity, the

hydraulic gradient, and the cross-sectional area for groundwater flow. SEEP/W has the capability to simulate flow in multiple layers, and a separate hydraulic conductivity is required for each layer. Hydraulic conductivities used in the Kleinfelder model ranged from 0.028 ft/day for clay to 283 ft/day for gravel. The maximum hydraulic conductivity used for the permeable layers in most reaches was 14 ft/day (representing sand). The Kleinfelder model was based on a previous mitigation plan that included a total of 42,300 lf of slurry cutoff walls in 12 reaches.

The SEEP/W model allows both steady-state and transient simulations to be conducted. As discussed below, a transient simulation was conducted for one station, but the results were not used in the overall seepage estimate. The reported model results were based on steady-state simulations conducted for four stations, which were considered to be representative of the different geologic conditions observed on geologic profiles created from borehole data. The modeled stations were located at Stations 27+00 in Reach 1, 70+00 in Reach 2, 217+00 in Reach 4b, and 353+00 in Reach 7b. Model results from these stations were applied to other reaches with similar geology. The percentage of the entire length of the Sacramento River East Levee represented by each modeled station was 11 percent for Station 27+00, 23 percent for Station 70+00, 42 percent for Station 217+00, and 24 percent for Station 353+00.

Kleinfelder used an "average" groundwater elevation of 17.25 ft msl for all simulations. This was compared against river stage at the Verona gage ranging from 17.25 to 34.25 ft msl in one-foot increments to calculate the gradient between the River and shallow groundwater. The steady-state model was run separately for each stage height, and the estimated seepage was multiplied by the number of days that the stage was calculated to be at each elevation based on data from 1995-2007. The lowest stage height (17.25 ft msl) had the longest duration (20 days/year), and the three highest stage heights (32.25, 33.25, and 34.25 ft msl) each had a duration of ten days/year.

Since almost all of the groundwater flow occurs in the sand layers, the model is very sensitive to the hydraulic conductivity used for sands. A hydraulic conductivity of 14 ft/day was used for sand layers in three of the four modeled reaches, and the calculated seepage rate was relatively low (2.6 to 13.4 afy/1,000 lf) in these reaches. Hydraulic conductivities of 56 and 283 ft/day were used for sand and gravel, respectively, at Station 217+00, and the resulting seepage rate was much higher (129 afy/1,000 lf). These seepage estimates were multiplied by the length of each reach to estimate the total seepage, and the results are shown in **Table 6-3**. The total seepage was estimated to be about 5,650 afy without slurry cutoff walls using this approach.

The model was rerun for Stations 70+00 and 353+00 with the slurry cutoff walls in place to estimate the effect of the cutoff walls. A hydraulic conductivity of 2.8×10^{-3} ft/day was estimated for the cutoff walls. For Station 70+00, the cutoff wall was assumed to fully penetrate the permeable sand layer and a seepage reduction of 85 percent was calculated. At Station 353+00, the cutoff wall was assumed to not fully penetrate the permeable sand layer and was calculated to reduce seepage by only 40 percent. The model results for the four stations were multiplied by one of these percentages to estimate the impacts of the other cutoff walls. The 85 percent reduction was used for reaches where the cutoff wall was considered to fully penetrate the permeable sand layer, and the 40 percent reduction was used for reaches where the wall

would not be fully penetrating. As shown in **Table 6-3**, the total amount of groundwater flow that would be blocked by the eight miles of proposed slurry cutoff walls is about 1,320 afy.

A transient version of the model was created for Station 70+00 to check the results of the steady-state simulations. The transient model was run with and without the slurry cutoff walls for a one-year period divided into 34 time steps. Groundwater elevations and river stage were allowed to fluctuate based on stage measured at the Verona gage and groundwater levels at USACE piezometer 2F-01-15N. Seepage without the cutoff wall calculated with the transient model was three times higher than that calculated with the steady-state model. Seepage through the cross-sectional area where the cutoff wall would be constructed was about four times higher with the transient model as compared to the steady-state model. On a percentage basis, the calculated flow reduction for the transient model was about 70 percent, which is less than the 85 percent reduction calculated with the steady-state model.

Overall, the Kleinfelder transient model results appear to be more realistic than the steady-state results. This would be expected since steady-state models require an assumption of equilibrium conditions and cannot simulate conditions that vary with time. For this reason, transient model results are considered more accurate for most applications. However, steady-state model results had to be used for Kleinfelder's overall seepage estimate shown in **Table 6-3** because only one station was simulated with the transient model. As discussed below, some of the Kleinfelder transient model results were used for LSCE's evaluation of cutoff wall impacts on seepage from the River and head changes in private wells along the east levee.

On a percentage basis, the transient and steady-state models showed varying results for flow reductions caused by the cutoff walls. Based on the transient model, a flow reduction of 70 percent due to horizontal flow through a fully-penetrating cutoff wall was considered to be a reasonable estimate. This estimate is considered to be conservative in that it does not account for increased vertical flow beneath the cutoff walls or horizontal flow around the cutoff walls. A three-dimensional model would be expected to show a somewhat smaller flow reduction due to the cutoff walls.

6.1.2 LSCE Seepage Estimates

Since almost all of the groundwater flow beneath the levees occurs in the permeable sand and gravel layers, a seepage estimate equivalent to the SEEP/W model can be obtained by simply calculating groundwater flow in the sand and gravel layers using Darcy's equation. An updated version of the estimate made by LSCE (2008a) is summarized in **Table 6-4** and discussed in this section. As noted above, Darcy's equation states that the volumetric rate of groundwater flow is equal to the product of the hydraulic conductivity, the cross-sectional area, and the hydraulic gradient (Darcy, 1856). Groundwater flow for 57 reaches or sub-reaches was estimated separately and then summed to estimate the total net recharge from the River. The term "net recharge" is used because the hydraulic gradient used for the simulations is an average value that accounts for the fact that the Sacramento River fluctuates between gaining and losing conditions over the course of the year. On an annual basis, however, all reaches of the Sacramento River in the Natomas Basin appear to be losing, as discussed above in Chapter 3.

For these seepage estimates, groundwater flow in fine to medium sands was estimated separately from that in coarse sands and gravels. For each category, the hydraulic conductivity and gradient were assumed to be constant for all reaches. Hydraulic conductivities used in the model are based on estimates summarized in **Table 2-1**. A hydraulic conductivity of 28 ft/day was used for the fine to medium sands, which is higher than the estimate used by Kleinfelder for three of the stations simulated with the SEEP/W model (14 ft/day). A hydraulic conductivity of 140 ft/day was used for coarse sands and gravels, which is within the range of estimates used by Kleinfelder for similar materials at Station 217+00 (56 to 283 ft/day).

The hydraulic gradient used for the Darcy's Law estimate was 0.0032 ft/ft based on the average annual value estimated in LSCE (2008a). As discussed in Section 4, this hydraulic gradient accounts for the large seasonal fluctuations observed in the hydrographs of groundwater levels and estimated stage. Steep positive gradients (losing conditions) occurring during periods of rising and high stage are partially offset by shallow negative gradients (gaining conditions) during periods of declining and low stage. Although the groundwater contour maps show that the gradient is steeper in the southern portion of the Natomas Basin, the piezometer data and stage estimates were not accurate enough to allow this spatial variability to be quantified.

For each reach, the saturated thickness of permeable sands and gravels was estimated from the geologic profiles, which contain data for the upper 100 to 120 feet of the aquifer system. The permeable saturated thickness for fine to medium sands ranged from eight to 80 feet, with an average of 46 feet. The permeable saturated thickness for coarse sands and gravels ranged from zero to 53 feet, with an average of seven feet. These thicknesses were multiplied by the length of each reach to estimate the cross-sectional area for groundwater flow. Because the overall length of the Sacramento River East Levee is about 18 miles, the total cross-sectional area is very large (about 5.8 million square feet or 134 acres).

As shown in **Table 6-4**, the estimated groundwater flow in each reach ranges by several orders of magnitude, from one to about 2,200 afy. The total estimated groundwater flow in the shallow aquifer without slurry cutoff walls is 8,450 afy. Although the coarse sand and gravel layers account for only 23 percent of the total saturated thickness, groundwater flow in these layers accounts for 60 percent of the total estimated flow. The total flow is about 50 percent more than was estimated by Kleinfelder using the steady-state SEEP/W model but is less than would be expected had Kleinfelder applied its transient model to all reaches.

The estimated effect of the slurry cutoff walls was partially based on the Kleinfelder transient model results. The estimate of a 70 percent reduction in groundwater flow obtained with the transient model was used for reaches where the cutoff wall fully penetrated the permeable sand layer. LSCE's interpretation of the geologic profiles indicates that the slurry cutoff walls will only be fully penetrating for portions of five of the 13 reaches where cutoff walls are proposed. For the other eight reaches, a 70 percent flow reduction was assumed for the depth of the cutoff wall and no flow reduction below the bottom of the cutoff wall. Using this approach, the effect of the cutoff walls is estimated to range from two to 70 percent of the total flow in these reaches. The estimated flow reduction due to all proposed cutoff walls is 884 afy, as shown in **Table 6-4**. This represents a reduction of about ten percent of the total estimated recharge from the Sacramento River.

The estimate of slurry cutoff wall impacts in **Table 6-4** is based on existing groundwater conditions in the Natomas Basin. In order to estimate impacts in 2030, the hydraulic gradient was increased to reflect the steeper gradient that would occur in the northern portion of the Natomas Basin primarily due to pumping to supply the proposed Sutter Pointe development. As shown in **Table 6-5**, the magnitude of the predicted increase ranges from a maximum of 0.0018 ft/ft in Reaches 2 and 3 to zero in Reaches 14 through 20. The total estimated recharge from the River without slurry cutoff walls would increase to 9,340 afy, and the estimated flow reduction due to all proposed cutoff walls would increase to 992 afy. These flow reductions are also summarized in **Table 6-6**, which shows the estimated groundwater flow through the cross-sectional area of the proposed slurry cutoff walls with and without the walls for all levees surrounding the Natomas Basin based on existing/2004 and future/2030 conditions.

Like the Kleinfelder model results, the reduction in flow due to the proposed slurry cutoff walls calculated by LSCE is conservative because the model only accounts for horizontal flow through the cutoff walls. Increased vertical flow beneath the cutoff walls and increased horizontal flow around the ends of the cutoff walls are not included in the model, which means that the actual flow reduction would be less than simulated. The reduction in groundwater flow beneath the levee due to the cutoff walls equates to reduced recharge from the Sacramento River to the Natomas Basin. During periods when the River is losing, heads will be lower on the land side of the levee and higher on the river side due to the impedance caused by the cutoff walls and the resultant reduction in groundwater flow. Flow that would be impeded by the cutoff walls would be expected to remain in the River, which will provide a benefit to downstream users.

6.2 Natomas Cross Canal South Levee

6.2.1 Kleinfelder Model

Slurry cutoff walls are currently under construction along the NCC South Levee as summarized in **Table 6-2**. Seepage beneath the NCC South Levee with and without slurry cutoff walls was estimated by Kleinfelder using the SEEP/W groundwater flow model. The model results are included in a report entitled *Evaluation of Cutoff Walls Impact on Groundwater Recharge, Natomas Cross Canal South Levee, Natomas Levee Improvement Project, Sacramento and Sutter Counties, California* (Kleinfelder, 2008) and are summarized below.

Hydraulic conductivities used in the model ranged from 0.028 ft/day for clay to 28 ft/day for sand. The maximum hydraulic conductivity is an order of magnitude less than the 283 ft/day used for some reaches of the Sacramento River East Levee because boreholes drilled along the NCC South Levee did not encounter significant gravel lenses. However, the permeable sand layers were assigned a hydraulic conductivity of 28 ft/day, which is double that used for the model of the Sacramento River East Levee.

Kleinfelder conducted both steady state and transient simulations were conducted for the NCC South Levee, but the results of the transient simulations were not used for the overall seepage estimate. The reported model results were based on steady-state simulations conducted for three stations, which were considered to be representative of the different geologic conditions observed on geologic profiles created from borehole data. The modeled stations were located at Stations 135+00 (Reach 4), 183+00 (Reach 5), and 213+00 (Reach 6). Stations 135+00 and

183+00 were modeled as having two relatively thin sand layers separated by a clay layer. Station 213+00 was modeled as having a single thicker sand layer. Model results from these stations were applied to other reaches with similar geology. The percentage of the entire length of the NCC South Levee represented by each modeled station was 35 percent for Station 135+00, 40 percent for Station 183+00, and 25 percent for Station 213+00.

An "average" depth to water of 7.5 feet was used for all simulations. This equates to a groundwater elevation of about 27.6 to 34.6 ft msl and was compared against NCC stage ranging from about 19.6 to 36.6 ft msl in one-foot increments to calculate the gradient between the canal and shallow groundwater. The steady-state model was run separately for each stage height, and the estimated seepage was multiplied by the number of days that the stage was calculated to be at each elevation based on data from the Sacramento River Verona gage for 1995-2007. The lowest stage height (19.6 ft msl) had the longest duration (about 20 days/year), and the three highest stage heights (34.6, 35.6, and 36.6 ft msl) each had a duration of about ten days/year.

Unlike its seepage model of the Sacramento River East Levee, Kleinfelder modeled all three stations of NCC South Levee using the same hydraulic conductivity (28 ft/day) for the most permeable layers. Therefore, the simulated seepage for the NCC was much less variable. Station 135+00 had the lowest estimated seepage rate (3.1 afy/1,000 lf). Station 183+00 had a seepage rate of 9.8 afy/1,000 lf, and Station 213+00 had a seepage rate of 9.1 afy/1,000 lf. These seepage estimates were multiplied by the length of each reach, and the total seepage was estimated to be about 218 afy without slurry cutoff walls using this approach.

The model was rerun for all three stations with the slurry cutoff walls in place to estimate the effect of the cutoff walls on seepage from the NCC. A hydraulic conductivity of 2.8×10^{-3} ft/day was assumed for the cutoff walls. For Station 135+00, the cutoff wall was assumed to fully penetrate both sand layers, resulting in an estimated seepage reduction of 90 percent. For Station 183+00, however, the cutoff wall was assumed to penetrate only the upper sand layer, which resulted in an estimated seepage reduction of 30 percent. For Station 213+00, the cutoff wall was assumed to fully penetrate the single sand layer, which also resulted in an estimated seepage reduction of 90 percent. The model results for the four stations were multiplied by one of these percentages to estimate the impacts of the other cutoff walls, and the total amount of groundwater flow that would be blocked by the slurry cutoff walls along the NCC South Levee under existing conditions was estimated to be 126 afy. This represents 90 percent of the flow through the cutoff wall cross section and 58 percent of the total flow calculated by the model. A flow reduction of 90 percent is considered to be high, and the flow reduction estimated from Kleinfelder's transient simulation for the Sacramento River East Levee was used for LSCE's seepage estimates discussed below.

6.2.2 LSCE Seepage Estimates

The Kleinfelder model of the NCC provides an estimate of canal seepage by does not include groundwater flow from the north into the Natomas Basin (beneath the NCC). As discussed in Chapter 4, this flow was estimated to be 241 afy based on the 2004 IGSM simulation. As shown in **Table 6-6**, the total flow into the Natomas Basin from the north is estimated as the sum of the groundwater flow estimated by the IGSM model and canal seepage estimate with the SEEP/W

model (218 afy). Approximately 80 afy of this flow is estimated to pass through the cross-sectional area of the proposed slurry cutoff walls, and a flow reduction of 70 percent was assumed due to the cutoff walls. The total estimated flow reduction shown in **Table 6-6** is 56 afy, or 12 percent of the total flow.

The impacts of slurry cutoff walls along the NCC South Levee were estimated similarly for 2030 conditions in **Table 6-6**. Seepage from the NCC was assumed to be relatively constant in future years, but groundwater flow beneath the NCC South Levee was estimated to be much larger (about 3,700 afy) in 2030 (**Table 4-1**) due primarily to steeper gradients caused by proposed M&I pumping in the Sutter County portion of the Natomas Basin. It is assumed that almost all of this flow would occur in the upper 400 feet of the aquifer system. Flow through the cross-sectional area where cutoff walls are proposed was estimated to be 686 afy, and a 70 percent flow reduction due to the slurry cutoff walls was again assumed. The estimated flow reduction for the 2030 simulation is 480 afy.

6.3 Pleasant Grove Creek Canal West Levee

Proposed slurry cutoff walls along the PGCC West Levee are summarized in **Table 6-2**, and the cutoff wall locations are shown on **Figure 6-1**. As discussed above, no modeling has been done to estimate the impacts of proposed slurry cutoff walls along the PGCC West Levee, the NEMDC West Levee, and the American River North Levee. For these levees, groundwater flow without slurry cutoff walls was estimated based on the IGSM groundwater model results discussed in Chapter 4. Based on the model results, an estimate of groundwater flow per cross-sectional area was developed for the 2004 and 2030 simulations (**Table 6-6**). For the reaches where slurry cutoff walls are proposed, flow through the cross-sectional area of the cutoff walls was reduced by a fixed percentage (70 percent) based on the Kleinfelder transient model results for the Sacramento River East Levee.

As discussed in Chapter 4, the IGSM model results show relatively large volumes of groundwater outflow from the Natomas Basin to the east beneath the PGCC and NEMDC for the 2004 simulation. The model results indicate much less outflow in 2030 due to higher heads east of the Natomas Basin resulting from the planned transition from groundwater to surface water to meet M&I demands in northern Sacramento County.

Flow beneath the PGCC West Levee with and without slurry cutoff walls is estimated in **Table 6-6**. Groundwater flow to the east beneath the levee without cutoff walls was estimated to be 4,512 afy based on the 2004 IGSM simulation and 233 afy based on the 2030 simulation. It was assumed that almost all of this flow occurs in the upper 400 feet of the aquifer system, which corresponds to Layer 1 and the upper portion of Layer 2 of the IGSM models. The slurry cutoff walls along the PGCC West Levee were assumed to be about 14,000 feet long with an average depth of 38 feet. Groundwater flow through this cross section without the cutoff walls was estimated to be 341 afy and 19 afy, based on the 2004 and 2030 simulations, respectively. The estimated flow reduction due to the slurry cutoff walls is assumed to be 70 percent or 238 afy for the 2004 simulation and 13 afy for the 2030 simulation. These flow reductions will be at least partially offset by the estimated increase in groundwater outflow beneath the PGCC due to pumping reductions planned for the Brookfield borrow site.

6.4 Natomas East Main Drainage Canal West Levee

Proposed slurry cutoff walls along the NEMDC West Levee are summarized in **Table 6-2**, and the cutoff wall locations are shown on **Figure 6-1**. The impacts of proposed slurry cutoff walls along the NEMDC West Levee were estimated similarly to the PGCC West Levee in **Table 6-6**. Groundwater flow to the east beneath the northern and southern portions of the NEMDC West Levee was estimated separately. For the northern NEMDC West Levee, groundwater flow to the east beneath the levee without cutoff walls was estimated to be 9,132 afy based on the IGSM 2004 simulation and 504 afy based on the 2030 simulation. As for the PGCC, it was assumed that almost all of this flow occurs in the upper 400 feet of the aquifer system. The slurry cutoff walls along the northern NEMDC West Levee were assumed to be 22,800 feet long and an average of 37 feet deep. Groundwater flow through this cross-sectional area without the cutoff walls was estimated to be 541 afy and 30 afy, based on the 2004 and 2030 simulations, respectively. A 70 percent flow reduction due to the slurry cutoff walls was again assumed based on the Kleinfelder transient simulation for the Sacramento River East Levee. The estimated flow reduction is 378 afy for the 2004 simulation and 21 afy for the 2030 simulation.

For the southern NEMDC West Levee, groundwater flow to the east beneath the levee without cutoff walls was estimated to be 8,156 afy based on the IGSM 2004 simulation and 450 afy based on the 2030 simulation, as shown in **Table 6-6**. The slurry cutoff walls along the southern NEMDC West Levee were assumed to be 23,100 feet long and an average of 45 feet deep. Groundwater flow through this cross-sectional area without the cutoff walls was estimated to be 665 afy and 37 afy, respectively, based on the 2004 and 2030 simulations. The estimated flow reduction is 466 afy for the 2004 simulation and 26 afy for the 2030 simulation.

6.5 American River North Levee

Slurry cutoff walls are currently proposed for the entire length of the American River North Levee, as shown on **Table 6-2** and **Figure 6-1**. The impacts of these slurry cutoff walls were estimated similarly to the PGCC and NEMDC West Levees in **Table 6-6**. This was assumed to be a generally losing reach under current conditions, and recharge from the American River to the Natomas Basin was estimated to be 1,086 afy based on the IGSM 2004 simulation. For the 2030 simulation, the direction of groundwater flow is indicated to be toward the River (gaining conditions), and simulated groundwater flow to the River was 500 afy. For both simulations, it was assumed that almost all of the flow to and from the River occurs in the upper 200 feet of the aquifer system. Planning for slurry cutoff walls along the American River North Levee is in the early stages, but cutoff walls are currently proposed to extend the entire length of the levee (11,560 lf) and average 55 feet deep.

Groundwater flow through the cross-sectional area where cutoff walls are proposed was estimated to be 301 afy away from the River for the 2004 simulation and –139 afy toward the River for the 2030 simulation. A 70 percent flow reduction due to the slurry cutoff walls was again assumed based on the Kleinfelder transient simulation for the Sacramento River East Levee. The estimated reduction in flow from the River was 211 afy for the 2004 simulation as shown in **Table 6-6**. The estimated reduction in flow to the River was 97 afy for the 2030 simulation.

6.6 Summary

The proposed slurry cutoff walls are expected to reduce groundwater flow beneath the levees as intended. Cutoff wall impacts shown in **Table 6-6** were estimated separately based on simulations of existing (or 2004) and future (2030) conditions. Estimates were based on models by Kleinfelder (2009) and LSCE (2008a) and IGSM model results (WRIME, 2007 and LSCE, 2008b). The predicted impacts of cutoff walls beneath each of the five levees surrounding the Natomas Basin are based on both the existing/2004 and future/2030 results because the impact varies both by location and simulation period. The results show that the impact to groundwater supplies in the Natomas Basin is greatest due to proposed cutoff walls along the Sacramento River East Levee. For the entire Natomas Basin, reduced recharge from the Sacramento and American Rivers is largely offset by reduced groundwater outflow to the east for the 2004 simulation. The total predicted impact of all slurry cutoff walls is only 68 afy based on "existing" or 2004 conditions.

The impact of slurry cutoff walls is predicted to be greater based on future/2030 conditions due to several factors. Gradients are expected to be steeper in the northern portion of the Natomas Basin due to pumping to supply the proposed Sutter Pointe development. This will increase groundwater flow beneath the Sacramento River East Levee and the NCC South Levee, and there will be a corresponding increase in flow reductions caused by slurry cutoff walls. At the same time, the IGSM model predicts less groundwater outflow to the east beneath the PGCC and NEMDC West Levees due to reduced pumping east of the Natomas Basin. The total predicted impact of all slurry cutoff walls increases to 1,315 afy for the future/2030 scenario.

There are also potential groundwater impacts east of the Natomas Basin, primarily because the proposed slurry cutoff walls beneath the PGCC and NEMDC West Levees will reduce groundwater outflow to the east. These impacts are predicted to occur primarily under existing conditions (based on the 2004 simulation) because the gradient for groundwater flow to the east is estimated to be much steeper under existing/2004 conditions. As shown in **Table 6-6**, the reduction in groundwater outflow beneath the PGCC and NEMDC West Levees is estimated to be 1,082 afy based on the 2004 simulation. The predicted reduction in groundwater outflow to the east decreases to 60 afy for the 2030 simulation.

As discussed above, these estimates of slurry cutoff wall impacts are conservative in that they do not account for increased vertical flow beneath the cutoff walls or horizontal flow around the cutoff walls. A three-dimensional model would be expected to show somewhat smaller flow reductions due to the cutoff walls.

Table 6-1
Proposed Mitigation for Seepage Beneath Sacramento River East Levee

Reach	Stations	Proposed Mitigation[1]	Length of Reach (ft)	Length of Cutoff Wall[1] (ft)	Cutoff Wall Platform Elevation[2] (ft msl)	Cutoff Wall Bottom Elevation[2] (ft msl)	Depth of Cutoff Wall (ft)
1	0+00 to 2+00	None	200	-	-	-	-
	2+00 to 26+00	Cutoff Wall	2,400	2,400	34	7	27
	26+00 to 46+00	Cutoff Wall	2,000	2,000	34	12	22
	46+00 to 48+00	Cutoff Wall	200	200	34	-27	61
2	48+00 to 98+00	Cutoff Wall	5,000	5,000	34	-27	61
	98+00 to 100+00	Cutoff Wall	200	200	33	-15	48
3	100+00 to 105+00	Cutoff Wall	500	500	33	-15	48
	105+00 to 109+00	Cutoff Wall	400	400	33	10	23
	109+00 to 110+00	Cutoff Wall 100-foot Berm	100	100	33	10	23
4a	110+00 to 142+00	Cutoff Wall 100-foot Berm	3,200	3,200	33	10	23
	142+00 to 187+00	Cutoff Wall 100-foot Berm	4,500	4,500	32	-5	37
	187+00 to 190+00	Cutoff Wall 300-foot Berm	300	300	32	-5	37
4b	190+00 to 201+50	Cutoff Wall 300-foot Berm	1,150	1,150	32	-25	57
	201+50 to 214+00	Cutoff Wall 300-foot Berm	1,250	1,250	32	18	14
	214+00 to 224+00	Cutoff Wall 500-foot Berm	1,000	1,000	32	18	14
	224+00 to 228+00	Cutoff Wall 300-foot Berm	400	400	32	18	14
5a	228+00 to 231+00	Cutoff Wall 300-foot Berm	300	300	35	-40	75
	231+00 to 250+00	Cutoff Wall	1,900	1,900	35	-40	75
	250+00 to 263+00	Cutoff Wall	1,300	1,300	35	-30	65
5b	263+00 to 280+00	Cutoff Wall	1,700	1,700	35	-5	40
6a	280+00 to 303+00	Cutoff Wall	2,300	2,300	35	-80	115
6b	303+00 to 320+00	Cutoff Wall	1,700	1,700	35	-80	115
	320+00 to 330+00	Cutoff Wall	1,000	1,000	35	-85	120
7	330+00 to 345+00	Cutoff Wall	1,500	1,500	35	-85	120
	345+00 to 362+00	Cutoff Wall	1,700	1,700	35	-50	85
8	362+00 to 373+00	Cutoff Wall	1,100	1,100	35	-50	85
	373+00 to 402+00	Cutoff Wall	2,900	2,900	35	-60	95
9a	402+00 to 407+00	Cutoff Wall	500	500	35	-50	85
9b	407+00 to 425+00	Cutoff Wall	1,800	1,800	35	-60	95
	425+00 to 438+00	Cutoff Wall	1,300	1,300	35	-55	90
	438+00 to 456+00	Cutoff Wall	1,800	1,800	35	-50	85
	456+00 to 464+00	Cutoff Wall	800	800	35	-60	95
	464+00 to 468+00	Cutoff Wall 100-foot Berm w/ Relief Wells	400	400	35	-60	95

Table 6-1 (continued)
Proposed Mitigation for Seepage Beneath Sacramento River East Levee

Reach	Stations	Proposed Mitigation[1]	Length of Reach (ft)	Length of Cutoff Wall[1] (ft)	Cutoff Wall Platform Elevation[2] (ft msl)	Cutoff Wall Bottom Elevation[2] (ft msl)	Depth of Cutoff Wall (ft)
10	468+00 to 495+00	100-foot Berm w/ Relief Wells	2,700	-	-	-	-
11a	495+00 to 535+00	100-foot Berm w/ Relief Wells	4,000	-	-	-	-
11b	535+00 to 635+00	500-foot Berm	10,000	-	-	-	-
12a	635+00 to 650+00	500-foot Berm	1,500	-	-	-	-
	650+00 to 655+00	Cutoff Wall	500	500	35	-35	70
12b	655+00 to 667+00	Cutoff Wall	1,200	1,200	35	-35	70
13	667+00 to 671+00	Cutoff Wall	400	400	35	-35	70
	671+00 to 678+00	Cutoff Wall Relief Wells	700	700	35	-35	70
	678+00 to 681+50	Cutoff Wall 100-foot Berm w/ Relief Wells	350	350	35	-35	70
13	681+50 to 698+00	100-foot Berm w/ Relief Wells	1,650	-	-	-	-
	698+00 to 700+00	Cutoff Wall 100-foot Berm w/ Relief Wells	200	200	35	-40	75
14	700+00 to 701+00	Cutoff Wall 100-foot Berm w/ Relief Wells	100	100	35	-40	75
	701+00 to 732+00	Cutoff Wall	3,100	3,100	35	-40	75
15	732+00 to 735+00	Cutoff Wall 100-foot Berm w/ Relief Wells	300	300	35	-40	75
	735+00 to 769+50	100-foot Berm w/ Relief Wells	3,450	-	-	-	-
	769+50 to 780+00	100-foot Berm w/ Relief Wells	1,050	-	-	-	-
16	780+00 to 832+00	Relief Wells	5,200	-	-	-	-
17	832+00 to 842+00	100-foot Berm w/ Relief Wells	1,000	-	-	-	-
18a	842+00 to 848+00	100-foot Berm w/ Relief Wells	600	-	-	-	-
18b	848+00 to 857+00	100-foot Berm w/ Relief Wells	900	-	-	-	-
19a	857+00 to 875+00	100-foot Berm w/ Relief Wells	1,800	-	-	-	-
19b	875+00 to 925+00	Relief Wells	5,000	-	-	-	-
20a	925+00 to 925+50	Jet Grouting at Pump Plant	50	-	-	-	-
20b	925+50 to 960+00	None	3,450	-	-	-	-
			96,000	53,450			

1. Proposed mitigation and length of cutoff walls based on HDR Technical Memorandum (April 17, 2009).
2. Vertical datum = NAVD88.

Table 6-2
Proposed Slurry Cutoff Wall Locations Along Natomas Cross Canal, Pacific Grove Creek Canal, Natomas East Main Drainage Canal, and American River

Levee	Reach	Stations	Proposed Mitigation	Length of Reach (ft)	Length of Cutoff Wall (ft)	Cutoff Wall Bottom Elevation (ft msl)	Depth of Cutoff Wall (ft)
Natomas Cross Canal South Levee	1	00+00 to 5+70	Cutoff Wall	570	570	-28	70
	2	5+70 to 105+00	Cutoff Wall	9,930	9,930	-28	70
	3	105+00 to 123+00	Cutoff Wall	1,800	1,800	-28	70
	4	123+00 to 173+00	Cutoff Wall	5,000	5,000	-38	70
	5	173+00 to 195+00	Cutoff Wall	2,200	2,200	-38	70
	6	195+00 to 280+00	Cutoff Wall	8,500	8,500	-38	70
	7	280+00 to 287+00	Cutoff Wall	700	700	-38	70
	Subtotal			28,700	28,700		
Pacific Grove Creek Canal West Levee	1	287+37 to 356+20	Cutoff Wall	6,883	6,883	-10	45
	2	356+20 to 390+00	None	3,380	-	-	-
	3a	390+00 to 430+00	Cutoff Wall	4,000	4,000	15	20
	3b	430+00 to 461+31	Cutoff Wall	3,131	3,131	-15	50
	Subtotal			17,394	14,014		
Natomas East Main Drainage Canal (North)	8	645+00 to 675+65	None	3,065	-	-	-
	7	576+00 to 645+00	Cutoff Wall	6,900	6,900	10-15	35-40
	6	555+00 to 576+00	None	2,100	-	-	-
	5	505+00 to 555+00	Cutoff Wall	5,000	5,000	15	30
	4	467+00 to 505+00	None	3,800	-	-	-
	3	425+00 to 467+00	Cutoff Wall	4,200	4,200	0	45
	2	386+17 to 425+00	None	3,883	-	-	-
	1	318+75 to 386+17	Cutoff Wall	6,742	6,742	10	35
	Subtotal			35,690	22,842		
Natomas East Main Drainage Canal (South)	7c	305+65 to 318+75	Cutoff Wall	1,310	1,310	-10	53
	7b	265+50 to 305+65	None	4,015	-	-	-
	7a	235+00 to 265+50	None	3,050	-	-	-
	6	196+00 to 235+00	Cutoff Wall	3,900	3,900	-10	53
	5	154+00 to 196+00	Cutoff Wall	4,200	4,200	13	30
	4	114+00 to 154+00	Cutoff Wall	4,000	4,000	-10	53
	3	71+00 to 114+00	Cutoff Wall	4,300	4,300	13	30
	2	17+00 to 71+00	Cutoff Wall	5,400	5,400	-10	53
	1	00+00 to 17+00	None	1,700	-	-	-
	Subtotal			31,875	23,110		
American River North Levee	4	73+10 to 115+60	Cutoff Wall	4,250	4,250		80
	3	63+10 to 73+10	Cutoff Wall	1,000	1,000		80
	2	16+10 to 63+10	Cutoff Wall	4,700	4,700		35
	1	0+00 to 16+10	Cutoff Wall	1,610	1,610		35
	Subtotal			11,560	11,560		
Total Length				125,219	100,226		

Table 6-3
Kleinfelder Model Results: Estimated Groundwater Flow Beneath Sacramento River East Levee in Natomas Basin With and Without Slurry Cutoff Walls[1]

Reach	Stations		Seepage Based on Simulated Station	Length of Reach (ft)	Seepage Without Cutoff Walls (afy)	Seepage With Cutoff Walls (afy)	Impact of Cutoff Walls	
	Start	End					(afy)	(%)
1	00+00	48+00	27+00	4,800	19	19	0	0
2	48+00	100+00	70+00	5,200	14	2	12	85
3	100+00	110+00	70+00	1,000	3	0.4	2.6	85
4a	110+00	120+00	70+00	1,000	3	3	0	0
4a	120+00	190+00	353+00	7,000	95	95	0	0
4b	190+00	228+00	217+00	3,800	490	490	0	0
5a	228+00	263+00	70+00	3,500	10	10	0	0
5b	263+00	280+00	27+00	1,700	6	6	0	0
6	280+00	330+00	217+00	5,000	650	100	550	85
7a	330+00	345+00	353+00	1,500	20	3	17	85
7b	345+00	362+00	353+00	1,700	23	3	20	85
8	362+00	402+00	353+00	4,000	55	8	47	85
9	402+00	430+00	353+00	2,800	38	38	0	0
9	430+00	468+10	353+00	3,800	50	8	42	85
10	468+10	495+00	217+00	2,690	350	210	140	40
11	495+00	635+00	217+00	14,000	1810	1810	0	0
12	635+00	640+00	217+00	500	65	65	0	0
12	640+00	667+00	70+00	2,700	7	7	0	0
13	667+00	700+00	353+00	3,300	45	30	15	40
14	700+00	732+00	70+00	3,200	8	8	0	0
15	732+00	780+00	217+00	4,800	620	375	245	40
16	780+00	832+00	217+00	5,200	675	675	0	0
17	832+00	842+00	217+00	1,000	130	80	50	40
18	842+00	857+00	217+00	1,500	195	120	75	40
19a	857+00	875+00	217+00	1,800	235	140	95	40
19b	875+00	925+00	70+00	5,000	15	8	7	40
20a	925+00	925+50	27+00	50	0.2	0.2	0	0
20b	925+50	960+00	27+00	3,550	13	13	0	0
Total				**96,090**	**5,650**	**4,330**	**1,320**	**23**

1. Based on Table 5 in Kleinfelder (2009). Shading indicates reaches with proposed cutoff walls.

Table 6-4
Darcy's Law Estimate of Groundwater Recharge from Sacramento River to Natomas Basin With and Without Slurry Cutoff Walls
(Based on Existing Conditions)

Reach	Stations	Proposed Mitigation Includes Cutoff Wall	Length of Reach (ft)	Length of Cutoff Wall (ft)	Cutoff Wall Depth (ft)	Cutoff Wall Bottom Elev. (ft msl)	Average Ground-Water Elev. (ft)	Saturated Fine/Medium Sand Thickness		Saturated Coarse Sand & Gravel Thickness		Permeable Area (length x thickness)				Hydraulic Conductivity[2]		Hydraulic Gradient[3] (ft/ft)	Estimated Flow Without Cutoff Walls			Flow Through Cross-Sectional Area of Cutoff Walls (afy)	Estimated Flow With Cutoff Walls			Impact of Cutoff Walls	
												Fine/Medium Sand Area		Coarse Sand & Gravel Area													
								Total (ft)	To Base of Wall (ft)	Total (ft)	To Base of Wall (ft)	Total (sq. ft)	To Base of Wall (sq. ft)	Total (sq. ft)	To Base of Wall (sq. ft)	Fine/ Medium Sand (ft/day)	Coarse Sand & Gravel (ft/day)		Fine/ Medium Sand (afy)	Coarse Sand & Gravel (afy)	Total Flow (afy)		Flow Through Cutoff Walls[4] (afy)	Flow Beneath/ Around Cutoff Walls (afy)	Total Flow (afy)	(afy)	(%)
1	0+00 to 2+00	No	200	-	-	-	19.8	35	-	0	-	7,000	N/A	0	N/A	28	140	0.0032	5	0	5	0	0	5	5	0	0
	2+00 to 26+00	Yes	2,400	2,400	27	7	19.8	35	0	0	0	84,000	0	0	0	28	140	0.0032	63	0	63	0	0	63	63	0	0
	26+00 to 46+00	Yes	2,000	2,000	22	12	19.8	26	0	0	0	52,000	0	0	0	28	140	0.0032	39	0	39	0	0	39	39	0	0
	46+00 to 48+00	Yes	200	200	61	-27	19.8	64	11	0	0	12,800	2200	0	0	28	140	0.0032	10	0	10	2	0	8	8	1	12
2	48+00 to 98+00	Yes	5,000	5,000	61	-27	19.8	67	22	0	0	335,000	110,000	0	0	28	140	0.0032	252	0	252	83	25	169	194	58	23
	98+00 to 100+00	Yes	200	200	48	-15	19.8	30	17	0	0	6,000	3,400	0	0	28	140	0.0032	5	0	5	3	1	2	3	2	40
3	100+00 to 105+00	Yes	500	500	48	-15	19.8	21	19	0	0	10,500	9,500	0	0	28	140	0.0032	8	0	8	7	2	1	3	5	63
	105+00 to 109+00	Yes	400	400	23	10	19.8	13	0	0	0	5,200	0	0	0	28	140	0.0032	4	0	4	0	0	4	4	0	0
	109+00 to 110+00	Yes	100	100	23	10	19.8	11	0	0	0	1,100	0	0	0	28	140	0.0032	1	0	1	0	0	1	1	0	0
4a	110+00 to 142+00	Yes	3,200	3,200	23	10	19.3	43	0	14	0	137,600	0	44,800	0	28	140	0.0032	103	168	271	0	0	271	271	0	0
	142+00 to 187+00	Yes	4,500	4,500	37	-5	19.3	60	5	30	0	270,000	22,500	135,000	0	28	140	0.0032	203	507	709	17	5	693	698	12	2
	187+00 to 190+00	Yes	300	300	37	-5	19.3	27	0	11	0	8,100	0	3,300	0	28	140	0.0032	6	12	18	0	0	18	18	0	0
4b	190+00 to 201+50	Yes	1,150	1,150	57	-25	18.8	50	25	5	2	57,500	28,750	5,750	2,300	28	140	0.0032	43	22	65	30	9	35	44	21	33
	201+50 to 214+00	Yes	1,250	1,250	14	18	18.8	55	25	15	0	68,750	31,250	18,750	0	28	140	0.0032	52	70	122	23	7	99	106	16	13
	214+00 to 224+00	Yes	1,000	1,000	14	18	18.8	65	0	25	0	65,000	0	25,000	0	28	140	0.0032	49	94	143	0	0	143	143	0	0
	224+00 to 228+00	Yes	400	400	14	18	18.8	40	0	0	0	16,000	0	0	0	28	140	0.0032	12	0	12	0	0	12	12	0	0
5a	228+00 to 231+00	Yes	300	300	75	-40	17.3	34	8	0	0	10,200	2,400	0	0	28	140	0.0032	8	0	8	2	1	6	6	1	16
	231+00 to 250+00	Yes	1,900	1,900	75	-40	17.3	22	22	0	0	41,800	41,800	0	0	28	140	0.0032	31	0	31	31	9	0	9	22	70
	250+00 to 263+00	Yes	1,300	1,300	65	-30	17.3	27	10	0	0	35,100	13,000	0	0	28	140	0.0032	26	0	26	10	3	17	20	7	26
5b	263+00 to 280+00	Yes	1,700	1,700	40	-5	17.3	27	0	0	0	45,900	0	0	0	28	140	0.0032	34	0	34	0	0	34	34	0	0
6a	280+00 to 303+00	Yes	2,300	2,300	115	-80	17.3	65	65	35	15	149,500	149,500	80,500	34,500	28	140	0.0032	112	302	414	242	73	173	245	169	41
6b	303+00 to 320+00	Yes	1,700	1,700	115	-80	17.8	55	55	20	20	93,500	93,500	34,000	34,000	28	140	0.0032	70	128	198	198	59	0	59	138	70
	320+00 to 330+00	Yes	1,000	1,000	120	-85	17.8	55	55	20	20	55,000	55,000	20,000	20,000	28	140	0.0032	41	75	116	116	35	0	35	81	70
7	330+00 to 345+00	Yes	1,500	1,500	120	-85	17.8	70	70	19	19	105,000	105,000	28,500	28,500	28	140	0.0032	79	107	186	186	56	0	56	130	70
	345+00 to 362+00	Yes	1,700	1,700	85	-50	17.8	46	0	0	0	78,200	0	0	0	28	140	0.0032	59	0	59	0	0	59	59	0	0
8	362+00 to 373+00	Yes	1,100	1,100	85	-50	17.8	32	32	0	0	35,200	35,200	0	0	28	140	0.0032	26	0	26	26	8	0	8	18	70
	373+00 to 402+00	Yes	2,900	2,900	95	-60	17.8	33	33	0	0	95,700	95,700	0	0	28	140	0.0032	72	0	72	72	22	0	22	50	70
9a	402+00 to 407+00	Yes	500	500	85	-50	17.8	40	40	0	0	20,000	20,000	0	0	28	140	0.0032	15	0	15	15	5	0	5	11	70
9b	407+00 to 425+00	Yes	1,800	1,800	95	-60	17.3	30	30	0	0	54,000	54,000	0	0	28	140	0.0032	41	0	41	41	12	0	12	28	70
	425+00 to 438+00	Yes	1,300	1,300	90	-55	17.3	38	38	0	0	49,400	49,400	0	0	28	140	0.0032	37	0	37	37	11	0	11	26	70
	438+00 to 456+00	Yes	1,800	1,800	85	-50	17.3	25	25	0	0	45,000	45,000	0	0	28	140	0.0032	34	0	34	34	10	0	10	24	70

Table 6-4 (continued)
Darcy's Law Estimate of Groundwater Recharge from Sacramento River to Natomas Basin With and Without Slurry Cutoff Walls
(Based on Existing Conditions)

Reach	Stations	Proposed Mitigation Includes Cutoff Wall	Length of Reach (ft)	Length of Cutoff Wall (ft)	Cutoff Wall Depth (ft)	Cutoff Wall Bottom Elev. (ft msl)	Average Ground-Water Elev. (ft)	Saturated Fine/Medium Sand Thickness		Saturated Coarse Sand & Gravel Thickness		Permeable Area (length x thickness)				Hydraulic Conductivity[2]		Hydraulic Gradient[3] (ft/ft)	Estimated Flow Without Cutoff Walls			Flow Through Cross-Sectional Area of Cutoff Walls (afy)	Estimated Flow With Cutoff Walls			Impact of Cutoff Walls	
												Fine/Medium Sand Area		Coarse Sand & Gravel Area													
								Total (ft)	To Base of Wall (ft)	Total (ft)	To Base of Wall (ft)	Total (sq. ft)	To Base of Wall (sq. ft)	Total (sq. ft)	To Base of Wall (sq. ft)	Fine/ Medium Sand (ft/day)	Coarse Sand & Gravel (ft/day)		Fine/ Medium Sand (afy)	Coarse Sand & Gravel (afy)	Total Flow (afy)		Flow Through Cutoff Walls[4] (afy)	Flow Beneath/ Around Cutoff Walls (afy)	Total Flow (afy)	(afy)	(%)
9b	456+00 to 464+00	Yes	800	800	95	-60	17.3	34	34	0	0	27,200	27,200	0	0	28	140	0.0032	20	0	20	20	6	0	6	14	70
	464+00 to 468+00	Yes	400	400	95	-60	17.3	43	43	0	0	17,200	17,200	0	0	28	140	0.0032	13	0	13	13	4	0	4	9	70
10	468+00 to 495+00	No	2,700	-	-	-	17.3	28	-	22	-	75,600	N/A	59,400	N/A	28	140	0.0032	57	223	280	0	0	280	280	0	0
11a	495+00 to 535+00	No	4,000	-	-	-	17.3	32	-	53	-	128,000	N/A	212,000	N/A	28	140	0.0032	96	796	892	0	0	892	892	0	0
11b	535+00 to 635+00	No	10,000	-	-	-	17.3	32	-	53	-	320,000	N/A	530,000	N/A	28	140	0.0032	240	1,990	2,230	0	0	2,230	2,230	0	0
12a	635+00 to 650+00	No	1,500	-	-	-	12.8	65	-	0	-	97,500	N/A	0	N/A	28	140	0.0032	73	0	73	0	0	73	73	0	0
	650+00 to 655+00	Yes	500	500	70	-35	12.8	58	19	0	0	29,000	9,500	0	0	28	140	0.0032	22	0	22	7	2	15	17	5	23
12b	655+00 to 667+00	Yes	1,200	1,200	70	-35	12.8	58	19	0	0	69,600	22,800	0	0	28	140	0.0032	52	0	52	17	5	35	40	12	23
13	667+00 to 671+00	Yes	400	400	70	-35	13.3	58	19	0	0	23,200	7,600	0	0	28	140	0.0032	17	0	17	6	2	12	13	4	23
	671+00 to 678+00	Yes	700	700	70	-35	13.3	58	19	0	0	40,600	13,300	0	0	28	140	0.0032	30	0	30	10	3	20	23	7	23
	678+00 to 681+50	Yes	350	350	70	-35	13.3	58	19	0	0	20,300	6,650	0	0	28	140	0.0032	15	0	15	5	1	10	12	3	23
	681+50 to 698+00	No	1,650	-	-	-	13.3	57	-	0	-	94,050	N/A	0	N/A	28	140	0.0032	71	0	71	0	0	71	71	0	0
	698+00 to 700+00	Yes	200	200	75	-40	13.3	57	27	0	0	11,400	5,400	0	0	28	140	0.0032	9	0	9	4	1	5	6	3	33
14	700+00 to 701+00	Yes	100	100	75	-40	14.8	57	0	0	0	5,700	0	0	0	28	140	0.0032	4	0	4	0	0	4	4	0	0
	701+00 to 732+00	Yes	3,100	3,100	75	-40	14.8	50	0	7	0	155,000	0	21,700	0	28	140	0.0032	116	81	198	0	0	198	198	0	0
15	732+00 to 735+00	Yes	300	300	75	-40	15.8	57	27	0	0	17,100	8,100	0	0	28	140	0.0032	13	0	13	6	2	7	9	4	33
	735+00 to 769+50	No	3,450	-	-	-	15.8	60	-	15	-	207,000	N/A	51,750	N/A	28	140	0.0032	155	194	350	0	0	350	350	0	0
	769+50 to 780+00	No	1,050	-	-	-	15.8	60	-	15	-	63,000	N/A	15,750	N/A	28	140	0.0032	47	59	106	0	0	106	106	0	0
16	780+00 to 832+00	No	5,200	-	-	-	14.8	58	-	12	-	301,600	N/A	62,400	N/A	28	140	0.0032	226	234	461	0	0	461	461	0	0
17	832+00 to 842+00	No	1,000	-	-	-	13.8	73	-	2	-	73,000	N/A	2,000	N/A	28	140	0.0032	55	8	62	0	0	62	62	0	0
18a	842+00 to 848+00	No	600	-	-	-	12.8	75	-	0	-	45,000	N/A	0	N/A	28	140	0.0032	34	0	34	0	0	34	34	0	0
18b	848+00 to 857+00	No	900	-	-	-	12.3	75	-	0	-	67,500	N/A	0	N/A	28	140	0.0032	51	0	51	0	0	51	51	0	0
19a	857+00 to 875+00	No	1,800	-	-	-	10.3	80	-	0	-	144,000	N/A	0	N/A	28	140	0.0032	108	0	108	0	0	108	108	0	0
19b	875+00 to 925+00	No	5,000	-	-	-	8.3	60	-	0	-	300,000	N/A	0	N/A	28	140	0.0032	225	0	225	0	0	225	225	0	0
20a	925+00 to 925+50	No	50	-	-	-	6.3	20	-	2	-	1,000	N/A	100	N/A	28	140	0.0032	1	0	1	0	0	1	1	0	0
20b	925+50 to 960+00	No	3,450	-	-	-	4.3	24	-	2	-	82,800	N/A	6,900	N/A	28	140	0.0032	62	26	88	0	0	88	88	0	0
Average							16	46	20	7	2																
Total			96,000	53,450								4,466,400	1,084,850	1,357,600	119,300				3,353	5,096	8,450	1,262	379	7,187	7,566	884	10

1. Hydraulic conductivity based on estimates in Table 2-1.
2. Hydraulic gradient based on annual average value in Table 3-2.
3. Assumes a 70% reduction in flow through the cutoff wall based on the Kleinfelder transient model results (Kleinfelder, 2009).

Table 6-5
Darcy's Law Estimate of Groundwater Recharge from Sacramento River to Natomas Basin With and Without Slurry Cutoff Walls
(Including Increase in Hydraulic Gradient Due to Additional Pumping in 2030)

Reach	Stations	Proposed Mitigation Includes Cutoff Wall	Length of Reach (ft)	Length of Cutoff Wall (ft)	Cutoff Wall Depth (ft)	Cutoff Wall Bottom Elev. (ft msl)	Average Ground-Water Elev. (ft)	Saturated Fine/Medium Sand Thickness		Saturated Coarse Sand & Gravel Thickness		Permeable Area (length x thickness)				Hydraulic Conductivity[2]		Increase in Hydraulic Gradient[3] (ft/ft)	Hydraulic Gradient Including Sutter Pointe Pumping (ft/ft)	Estimated Flow Without Cutoff Walls			Flow Through Cross-Sectional Area of Cutoff Walls (afy)	Estimated Flow With Cutoff Walls			Impact of Cutoff Walls	
												Fine/Medium Sand Area		Coarse Sand & Gravel Area														
								Total (ft)	To Base of Wall (ft)	Total (ft)	To Base of Wall (ft)	Total (sq. ft)	To Base of Wall (sq. ft)	Total (sq. ft)	To Base of Wall (sq. ft)	Fine/ Medium Sand (ft/day)	Coarse Sand & Gravel (ft/day)			Fine/ Medium Sand (afy)	Coarse Sand & Gravel (afy)	Total Flow (afy)		Flow Through Cutoff Walls[4] (afy)	Flow Beneath/ Around Cutoff Walls (afy)	Total Flow (afy)	(afy)	(%)
1	0+00 to 2+00	No	200	-	-	-	19.8	35	-	0	-	7,000	N/A	0	N/A	28	140	0.0010	0.0042	7	0	7	0	0	7	7	0	0
	2+00 to 26+00	Yes	2,400	2,400	27	7	19.8	35	0	0	0	84,000	0	0	0	28	140	0.0010	0.0042	82	0	82	0	0	82	82	0	0
	26+00 to 46+00	Yes	2,000	2,000	22	12	19.8	26	0	0	0	52,000	0	0	0	28	140	0.0010	0.0042	51	0	51	0	0	51	51	0	0
	46+00 to 48+00	Yes	200	200	61	-27	19.8	64	11	0	0	12,800	2200	0	0	28	140	0.0010	0.0042	13	0	13	2	1	10	11	2	12
2	48+00 to 98+00	Yes	5,000	5,000	61	-27	19.8	67	22	0	0	335,000	110,000	0	0	28	140	0.0018	0.0050	391	0	391	128	39	263	301	90	23
	98+00 to 100+00	Yes	200	200	48	-15	19.8	30	17	0	0	6,000	3,400	0	0	28	140	0.0018	0.0050	7	0	7	4	1	3	4	3	40
3	100+00 to 105+00	Yes	500	500	48	-15	19.8	21	19	0	0	10,500	9,500	0	0	28	140	0.0018	0.0050	12	0	12	11	3	1	4	8	63
	105+00 to 109+00	Yes	400	400	23	10	19.8	13	0	0	0	5,200	0	0	0	28	140	0.0018	0.0050	6	0	6	0	0	6	6	0	0
	109+00 to 110+00	Yes	100	100	23	10	19.8	11	0	0	0	1,100	0	0	0	28	140	0.0018	0.0050	1	0	1	0	0	1	1	0	0
4a	110+00 to 142+00	Yes	3,200	3,200	23	10	19.3	43	0	14	0	137,600	0	44,800	0	28	140	0.0011	0.0043	140	228	367	0	0	367	367	0	0
	142+00 to 187+00	Yes	4,500	4,500	37	-5	19.3	60	5	30	0	270,000	22,500	135,000	0	28	140	0.0011	0.0043	274	686	960	23	7	937	944	16	2
	187+00 to 190+00	Yes	300	300	37	-5	19.3	27	0	11	0	8,100	0	3,300	0	28	140	0.0011	0.0043	8	17	25	0	0	25	25	0	0
4b	190+00 to 201+50	Yes	1,150	1,150	57	-25	18.8	50	25	5	2	57,500	28,750	5,750	2,300	28	140	0.0011	0.0043	58	29	88	41	12	47	59	29	33
	201+50 to 214+00	Yes	1,250	1,250	14	18	18.8	55	25	15	0	68,750	31,250	18,750	0	28	140	0.0011	0.0043	70	95	165	32	10	133	143	22	13
	214+00 to 224+00	Yes	1,000	1,000	14	18	18.8	65	0	25	0	65,000	0	25,000	0	28	140	0.0011	0.0043	66	127	193	0	0	193	193	0	0
	224+00 to 228+00	Yes	400	400	14	18	18.8	40	0	0	0	16,000	0	0	0	28	140	0.0011	0.0043	16	0	16	0	0	16	16	0	0
5a	228+00 to 231+00	Yes	300	300	75	-40	17.3	34	8	0	0	10,200	2,400	0	0	28	140	0.0005	0.0037	9	0	9	2	1	7	7	1	16
	231+00 to 250+00	Yes	1,900	1,900	75	-40	17.3	22	22	0	0	41,800	41,800	0	0	28	140	0.0005	0.0037	36	0	36	36	11	0	11	25	70
	250+00 to 263+00	Yes	1,300	1,300	65	-30	17.3	27	10	0	0	35,100	13,000	0	0	28	140	0.0005	0.0037	30	0	30	11	3	19	22	8	26
5b	263+00 to 280+00	Yes	1,700	1,700	40	-5	17.3	27	0	0	0	45,900	0	0	0	28	140	0.0005	0.0037	40	0	40	0	0	40	40	0	0
6a	280+00 to 303+00	Yes	2,300	2,300	115	-80	17.3	65	65	35	15	149,500	149,500	80,500	34,500	28	140	0.0003	0.0035	121	327	448	261	78	187	265	183	41
6b	303+00 to 320+00	Yes	1,700	1,700	115	-80	17.8	55	55	20	20	93,500	93,500	34,000	34,000	28	140	0.0003	0.0035	76	138	214	214	64	0	64	150	70
	320+00 to 330+00	Yes	1,000	1,000	120	-85	17.8	55	55	20	20	55,000	55,000	20,000	20,000	28	140	0.0003	0.0035	45	81	126	126	38	0	38	88	70
7	330+00 to 345+00	Yes	1,500	1,500	120	-85	17.8	70	70	19	19	105,000	105,000	28,500	28,500	28	140	0.0002	0.0034	84	115	199	199	60	0	60	139	70
	345+00 to 362+00	Yes	1,700	1,700	85	-50	17.8	46	0	0	0	78,200	0	0	0	28	140	0.0002	0.0034	63	0	63	0	0	63	63	0	0
8	362+00 to 373+00	Yes	1,100	1,100	85	-50	17.8	32	32	0	0	35,200	35,200	0	0	28	140	0.0002	0.0034	28	0	28	28	8	0	8	20	70
	373+00 to 402+00	Yes	2,900	2,900	95	-60	17.8	33	33	0	0	95,700	95,700	0	0	28	140	0.0002	0.0034	75	0	75	75	23	0	23	53	70
9a	402+00 to 407+00	Yes	500	500	85	-50	17.8	40	40	0	0	20,000	20,000	0	0	28	140	0.0001	0.0033	16	0	16	16	5	0	5	11	70
9b	407+00 to 425+00	Yes	1,800	1,800	95	-60	17.3	30	30	0	0	54,000	54,000	0	0	28	140	0.0001	0.0033	42	0	42	42	13	0	13	30	70
	425+00 to 438+00	Yes	1,300	1,300	90	-55	17.3	38	38	0	0	49,400	49,400	0	0	28	140	0.0001	0.0033	39	0	39	39	12	0	12	27	70
	438+00 to 456+00	Yes	1,800	1,800	85	-50	17.3	25	25	0	0	45,000	45,000	0	0	28	140	0.0001	0.0033	35	0	35	35	11	0	11	25	70

Table 6-5 (continued)
Darcy's Law Estimate of Groundwater Recharge from Sacramento River to Natomas Basin With and Without Slurry Cutoff Walls
(Including Increase in Hydraulic Gradient Due to Additional Pumping in 2030)

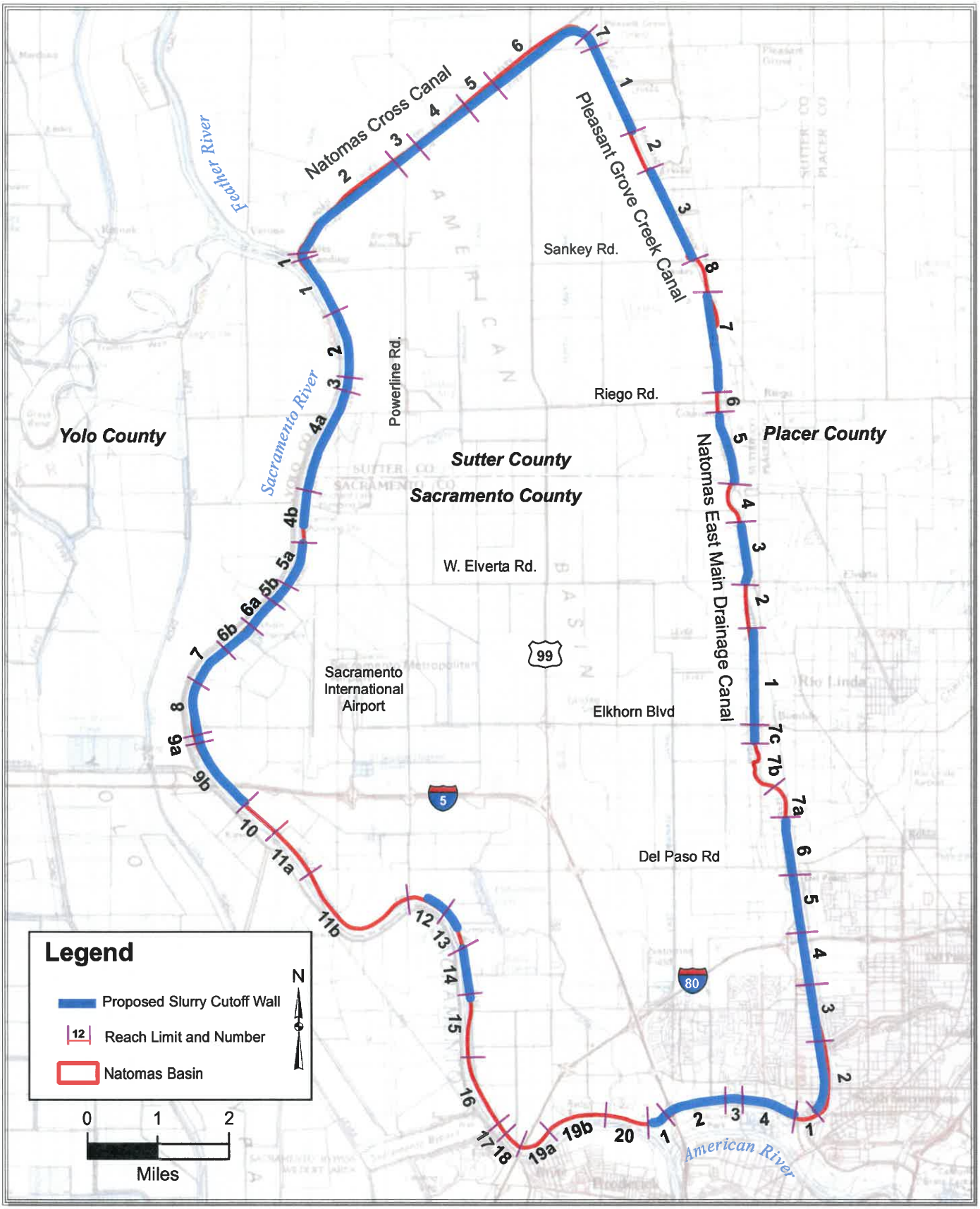
Reach	Stations	Proposed Mitigation Includes Cutoff Wall	Length of Reach (ft)	Length of Cutoff Wall (ft)	Cutoff Wall Depth (ft)	Cutoff Wall Bottom Elev. (ft msl)	Average Ground-Water Elev. (ft)	Saturated Fine/Medium Sand Thickness		Saturated Coarse Sand & Gravel Thickness		Permeable Area (length x thickness)				Hydraulic Conductivity[2]		Increase in Hydraulic Gradient[3] (ft/ft)	Hydraulic Gradient Including Sutter Pointe Pumping (ft/ft)	Estimated Flow Without Cutoff Walls			Flow Through Cross-Sectional Area of Cutoff Walls (afy)	Estimated Flow With Cutoff Walls			Impact of Cutoff Walls	
								Total (ft)	To Base of Wall (ft)	Total (ft)	To Base of Wall (ft)	Fine/Medium Sand Area		Coarse Sand & Gravel Area		Fine/ Medium Sand (ft/day)	Coarse Sand & Gravel (ft/day)			Fine/ Medium Sand (afy)	Coarse Sand & Gravel (afy)	Total Flow (afy)		Flow Through Cutoff Walls[4] (afy)	Flow Beneath/ Around Cutoff Walls (afy)	Total Flow (afy)	(afy)	(%)
												Total (sq. ft)	To Base of Wall (sq. ft)	Total (sq. ft)	To Base of Wall (sq. ft)													
9b	456+00 to 464+00	Yes	800	800	95	-60	17.3	34	34	0	0	27,200	27,200	0	0	28	140	0.0001	0.0033	21	0	21	21	6	0	6	15	70
	464+00 to 468+00	Yes	400	400	95	-60	17.3	43	43	0	0	17,200	17,200	0	0	28	140	0.0001	0.0033	13	0	13	13	4	0	4	9	70
10	468+00 to 495+00	No	2,700	-	-	-	17.3	28	-	22	-	75,600	N/A	59,400	N/A	28	140	0.0001	0.0033	59	232	291	0	0	291	291	0	0
11a	495+00 to 535+00	No	4,000	-	-	-	17.3	32	-	53	-	128,000	N/A	212,000	N/A	28	140	0.0001	0.0033	99	824	923	0	0	923	923	0	0
11b	535+00 to 635+00	No	10,000	-	-	-	17.3	32	-	53	-	320,000	N/A	530,000	N/A	28	140	0.0001	0.0033	249	2,060	2,308	0	0	2,308	2,308	0	0
12a	635+00 to 650+00	No	1,500	-	-	-	12.8	65	-	0	-	97,500	N/A	0	N/A	28	140	0.0001	0.0033	76	0	76	0	0	76	76	0	0
	650+00 to 655+00	Yes	500	500	70	-35	12.8	58	19	0	0	29,000	9,500	0	0	28	140	0.0001	0.0033	23	0	23	7	2	15	17	5	23
12b	655+00 to 667+00	Yes	1,200	1,200	70	-35	12.8	58	19	0	0	69,600	22,800	0	0	28	140	0.0001	0.0033	54	0	54	18	5	36	42	12	23
13	667+00 to 671+00	Yes	400	400	70	-35	13.3	58	19	0	0	23,200	7,600	0	0	28	140	0.0001	0.0033	18	0	18	6	2	12	14	4	23
	671+00 to 678+00	Yes	700	700	70	-35	13.3	58	19	0	0	40,600	13,300	0	0	28	140	0.0001	0.0033	31	0	31	10	3	21	24	7	23
	678+00 to 681+50	Yes	350	350	70	-35	13.3	58	19	0	0	20,300	6,650	0	0	28	140	0.0001	0.0033	16	0	16	5	2	11	12	4	23
	681+50 to 698+00	No	1,650	-	-	-	13.3	57	-	0	-	94,050	N/A	0	N/A	28	140	0.0001	0.0033	73	0	73	0	0	73	73	0	0
	698+00 to 700+00	Yes	200	200	75	-40	13.3	57	27	0	0	11,400	5,400	0	0	28	140	0.0001	0.0033	9	0	9	4	1	5	6	3	33
14	700+00 to 701+00	Yes	100	100	75	-40	14.8	57	0	0	0	5,700	0	0	0	28	140	0.0000	0.0032	4	0	4	0	0	4	4	0	0
	701+00 to 732+00	Yes	3,100	3,100	75	-40	14.8	50	0	7	0	155,000	0	21,700	0	28	140	0.0000	0.0032	116	81	198	0	0	198	198	0	0
15	732+00 to 735+00	Yes	300	300	75	-40	15.8	57	27	0	0	17,100	8,100	0	0	28	140	0.0000	0.0032	13	0	13	6	2	7	9	4	33
	735+00 to 769+50	No	3,450	-	-	-	15.8	60	-	15	-	207,000	N/A	51,750	N/A	28	140	0.0000	0.0032	155	194	350	0	0	350	350	0	0
	769+50 to 780+00	No	1,050	-	-	-	15.8	60	-	15	-	63,000	N/A	15,750	N/A	28	140	0.0000	0.0032	47	59	106	0	0	106	106	0	0
16	780+00 to 832+00	No	5,200	-	-	-	14.8	58	-	12	-	301,600	N/A	62,400	N/A	28	140	0.0000	0.0032	226	234	461	0	0	461	461	0	0
17	832+00 to 842+00	No	1,000	-	-	-	13.8	73	-	2	-	73,000	N/A	2,000	N/A	28	140	0.0000	0.0032	55	8	62	0	0	62	62	0	0
18a	842+00 to 848+00	No	600	-	-	-	12.8	75	-	0	-	45,000	N/A	0	N/A	28	140	0.0000	0.0032	34	0	34	0	0	34	34	0	0
18b	848+00 to 857+00	No	900	-	-	-	12.3	75	-	0	-	67,500	N/A	0	N/A	28	140	0.0000	0.0032	51	0	51	0	0	51	51	0	0
19a	857+00 to 875+00	No	1,800	-	-	-	10.3	80	-	0	-	144,000	N/A	0	N/A	28	140	0.0000	0.0032	108	0	108	0	0	108	108	0	0
19b	875+00 to 925+00	No	5,000	-	-	-	8.3	60	-	0	-	300,000	N/A	0	N/A	28	140	0.0000	0.0032	225	0	225	0	0	225	225	0	0
20a	925+00 to 925+50	No	50	-	-	-	6.3	20	-	2	-	1,000	N/A	100	N/A	28	140	0.0000	0.0032	1	0	1	0	0	1	1	0	0
20b	925+50 to 960+00	No	3,450	-	-	-	4.3	24	-	2	-	82,800	N/A	6,900	N/A	28	140	0.0000	0.0032	62	26	88	0	0	88	88	0	0
Average							16	46	20	7	2																	
Total			96,000	53,450								4,466,400	1,084,850	1,357,600	119,300					3,781	5,560	9,341	1,417	425	7,924	8,349	992	11

1. Hydraulic conductivity based on estimates in Table 2-1.
2. Hydraulic gradient based on annual average value in Table 3-2.
3. Assumes a 70% reduction in flow through the cutoff wall based on the Kleinfelder transient model results (Kleinfelder, 2009).

Table 6-6
Effects of Proposed Slurry Cutoff Walls on Groundwater Flow

Levee	Time Period	Total Length of Levee (ft)	Saturated Thickness for Ground-Water Flow (ft)	Cross-Sectional Area for Flow (ft^2)	Total Flow Without Cutoff Walls[1] (afy)	Flow per Cross-Sectional Area (afy/ft^2)	Length of Proposed Cutoff Walls (ft)	Average Depth of Cutoff Walls (ft)	Cross-Sectional Area of Cutoff Walls (ft^2)	Flow Through Cross-Sectional Area of Cutoff Walls (afy)	Flow Through, Beneath, or Around Cutoff Walls (afy)	Flow Reduction Due to Cutoff Walls[8] (afy)	(%)
Sacramento River East Levee	Existing	96,000	200	19,200,000	8,450 [2]	4.40E-04	53,500	65	3,474,300	1,262	7,566	884	10
	2030				9,341 [3]	4.40E-04				1,417	8,349	992	11
NCC South Levee	2004	28,700	400	11,480,000	459 [4]	4.00E-05	28,700	70	2,009,000	80	403	56	12
	2030				3,918 [5]	3.41E-04				686	3,438	480	12
PGCC West Levee	2004	17,400	400	6,957,600	-4,451 [6]	-6.40E-04	14,000	38	532,500	-341	-4,212	-238	5
	2030				-246 [7]	-3.53E-05				-19	-233	-13	5
NEMDC West Levee (North)	2004	35,700	400	14,276,000	-9,132 [6]	-6.40E-04	22,800	37	845,200	-541	-8,753	-378	4
	2030				-504 [7]	-3.53E-05				-30	-483	-21	4
NEMDC West Levee (South)	2004	31,900	400	12,750,000	-8,156 [6]	-6.40E-04	23,100	45	1,040,000	-665	-7,690	-466	6
	2030				-450 [7]	-3.53E-05				-37	-425	-26	6
American River North Levee	2004	11,600	200	2,312,000	1,086 [6]	4.70E-04	11,600	55	640,400	301	875	211	19
	2030				-500 [7]	-2.16E-04				-139	-403	-97	19
Total (Existing or 2004)					**-11,743**					**97**	**-4,106**	**68**	
Total (2030)					**11,559**					**1,879**	**10,244**	**1,315**	
Total (All)		**221,300**					**153,700**		**8,541,400**				

1. Positive values indicate groundwater inflow; negative values indicate goundwater outflow.
2. Source of total flow estimate = Table 6-4.
3. Source of total flow estimate = Table 6-5.
4. Source of total flow estimate = groundwater inflow from 2004 IGSM simulation (241 afy) plus canal seepage estimated by Kleinfelder (218 afy).
5. Source of total flow estimate = groundwater inflow from 2030 IGSM simulation (3,700 afy) plus canal seepage estimated by Kleinfelder (218 afy).
6. Source of total flow estimate = IGSM 2004 simulation.
7. Source of total flow estimate = IGSM 2030 simulation.
8. Increased groundwater inflow (or decreased outflow) shown as positive value; increased outflow (or decreased inflow) is shown as negative. 70% flow reduction assumed for slurry cutoff walls based on Kleinfelder (2009).



FILE: \\server_pe2900\Public\SAFCA\GIS\Fig 6-1 SlurryCutoffLocation map.mxd Date: 5/4/2009

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Figure 6-1
Proposed Slurry Cutoff Walls Surrounding Natomas Basin

7.0 Groundwater Impacts of SAFCA Construction Activities

The effects of SAFCA's proposed construction activities on groundwater conditions in the Natomas Basin were evaluated using the water budget approach discussed above. Water budget impacts resulting from land use changes and canal construction were addressed in Chapter 5, and water budget impacts due to proposed slurry cutoff walls were addressed in Chapter 6. All of the predicted impacts of SAFCA's activities are summarized in **Table 7-1** for existing/2004 conditions and in **Table 7-2** for future/2030 conditions. This chapter also addresses cumulative impacts for 2004 and 2030 conditions based on the groundwater budgets calculated by the IGSM models.

7.1 Levee Improvements

Groundwater impacts from proposed levee improvements are primarily limited to the effects of land use changes and slurry cutoff walls. No direct groundwater impacts are expected from increasing the height or width of levees, modifying levee slopes, or building seepage berms because all of this construction would be above the water table.

Proposed land use changes will result in the loss of about 20 acres of rice, 175 acres of field crops, and five acres of orchard along the Sacramento River East Levee. Other land use changes include the loss of five acres of rice along the NCC South Levee and 50 acres of rice along the PGCC West Levee. As shown in **Tables 7-1** and **7-2**, these changes are estimated to reduce deep percolation from applied water by a total of 105 afy.

Estimated reductions in groundwater flow beneath the levees due to the proposed slurry cutoff walls are shown in **Table 6-6** based both on simulations of "existing" (or 2004) and future (2030) conditions. Estimated inflow reductions for existing conditions shown in **Table 7-1** include 105 afy of deep percolation, 1,095 afy of recharge from the Sacramento and American Rivers, and 56 afy of inflow to the Natomas Basin beneath the NCC. The total estimated inflow reduction is 1,256 afy. The reduction in subsurface outflow from the Natomas Basin beneath the PGCC and NEMDC is estimated to be 1,083 afy. The estimated effect of all proposed slurry cutoff walls based on the simulation of existing conditions will be to reduce groundwater storage in the Natomas Basin by about 173 afy.

Estimated inflow reductions for 2030 conditions shown in **Table 7-2** include 105 afy of deep percolation, 895 afy of recharge from the Sacramento and American Rivers, and 480 afy of inflow to the Natomas Basin beneath the NCC. The total estimated inflow reduction is 1,480 afy. The reduction in subsurface outflow from the Natomas Basin beneath the PGCC and NEMDC is estimated to be 60 afy. The estimated effect of all proposed slurry cutoff walls based on the 2030 simulation would be to reduce groundwater storage in the Natomas Basin by about 1,420 afy.

7.2 Canal Improvements

The construction of the new GSS/Drainage Canal and relocation and improvements to the West Drainage Canal, the Elkhorn Canal, and the Riverside Canal will affect deep percolation from applied water (due to land use changes) and seepage from the canals. For all four canals, deep percolation is estimated to decrease by 41 afy and canal seepage is estimated to increase by 327 afy (**Tables 7-1** and **7-2**). The net effect of proposed canal construction would be to increase groundwater storage in the Natomas Basin by about 285 afy.

7.3 Borrow Sites

Excavation and reclamation of the Brookfield and Fisherman's Lake borrow sites is expected to have an indirect effect on groundwater conditions due to proposed land use and water supply changes. No such changes are planned for the Airport North Bufferlands borrow site.

At the Brookfield borrow site, approximately 325 acres are currently planted to rice, and SAFCA plans to restore about 286 acres to rice cultivation after construction activities are complete. As shown in **Tables 7-1** and **7-2**, an estimated 30 afy of deep percolation will be lost at this site due to the reduction in irrigated acreage. The Brookfield site is currently irrigated entirely with groundwater, but SAFCA plans to provide the infrastructure so that about 80 percent of the borrow site can be irrigated with surface water after reclamation. This transition would reduce groundwater pumping by about 1,625 afy. Groundwater levels will increase due to the reduced pumping, resulting in an increase in subsurface outflow beneath the PGCC of about 76 afy.

At the Fisherman's Lake borrow site, about 400 acres of land would be used for borrow material, including 49 acres currently planted to rice, 266 acres of field crops, and 85 acres of managed marsh. After reclamation, there would be about 175 acres of managed marsh and 225 acres of non-irrigated grassland or woodland. The predicted net loss in deep percolation is 36 afy at this site, as shown in **Tables 7-1** and **7-2**.

The reduction in groundwater pumping at the Brookfield site more than offsets the loss of deep percolation at all borrow sites. The net effect of excavation and reclamation of all borrow sites would be to increase groundwater storage by about 1,483 afy.

7.4 Summary of SAFCA Groundwater Impacts

The totals at the bottom of **Tables 7-1** and **7-2** show the combined effect of SAFCA's proposed construction activities based on exising/2004 and future/2030 conditions, respectively. For both simulations, deep percolation is estimated to decrease by 213 afy, seepage from canals is estimated to increase by 327 afy, and groundwater pumping is estimated to decrease by 1,625 afy. Other changes for existing/2004 conditions include decreases in net recharge from streams (1,095 afy), subsurface inflow (56 afy), and subsurface outflow (1,007 afy). Summing these terms results in an increase in groundwater storage in the Natomas Basin of 1,595 afy for existing/2004 conditions, which means that groundwater levels would be expected to increase slightly due to all construction activities. The reduction in subsurface outflow would have a slightly negative effect on groundwater levels and storage east of the Natomas Basin.

The totals at the bottom of **Table 7-2** show the combined effect of SAFCA's proposed construction activities based on future conditions in 2030. Estimated changes in deep percolation, seepage from canals, and groundwater pumping are the same as for existing/2004 conditions. The estimated reduction in net recharge from streams (895 afy) is smaller than for the 2004 simulation, and the reduction in subsurface inflow (480 afy) is larger. Groundwater storage in the Natomas Basin is predict to increase due to the proposed construction, but by a smaller amount (348 afy). Subsurface outflow to the east is predicted to increase slightly in 2030 (by 16 afy). These small changes would have a slightly positive effect on groundwater levels and storage in and near the Natomas Basin.

7.5 Cumulative Effects

The cumulative impacts of SAFCA's construction activities on existing groundwater conditions based on the 2004 and 2030 IGSM simulation are shown in **Tables 7-3** and **7-4**. On these tables, the estimated SAFCA impacts discussed above are added to the groundwater budget for the Natomas Basin discussed in Chapter 4. The 2004 groundwater budget showed a total groundwater inflow to the Natomas Basin of 52,304 afy without the effects of SAFCA's activities and 51,267 afy including the proposed construction (**Table 7-3**). There is a similar reduction in groundwater outflow from 57,275 afy without SAFCA's construction activities to 54,643 afy including the construction. The simulated reduction in groundwater storage for 2004 is 4,971 afy without SAFCA, which represents an average water level decline of about one foot. The decrease in groundwater storage would be smaller (3,376 afy) due to SAFCA's construction activities. Overall, SAFCA's proposed construction would have a small positive impact on groundwater supplies in the Natomas Basin based on existing conditions. Outside of the Natomas Basin, the predicted reduction in groundwater outflow to the east (1,007 afy) would have a small negative impact on groundwater levels and storage within the cones of depression east of the Natomas Basin, but groundwater outflow is still estimated to be large (20,731 afy).

The estimate of the cumulative impacts of SAFCA's construction activities based on the simulation of future (2030) groundwater conditions is summarized in **Table 7-4**. The 2030 groundwater budget shows that the total groundwater inflow to the Natomas Basin without the effects of SAFCA's activities (35,187 afy) would decrease to 33,926 afy including SAFCA proposed construction. This is offset by a reduction in groundwater outflow from 33,615 afy without SAFCA's construction activities to 32,006 afy including SAFCA's activities. The simulation shows an increase in groundwater storage in 2030 of 1,572 afy without SAFCA. The results indicate that, on average, SAFCA's construction activities will have a positive effect on groundwater levels in the Natomas Basin, resulting in an additional increase in storage of 348 afy (to 1,920 afy). Subsurface outflow to the east is predicted to be much smaller in 2030 (only 1,200 afy without SAFCA's construction activities), but would increase by 16 afy due to SAFCA's proposed construction. Overall, SAFCA's activities would have a slightly positive effect on groundwater levels and storage within and east of the Natomas Basin in 2030.

Table 7-1
Groundwater Budget for Proposed SAFCA Construction Activities Based on Existing Conditions

SAFCA Construction Activity	Inflow (afy)[1]					Outflow (afy)[1]			Change in Storage (afy)
	Deep Percolation	Net Recharge from Streams	Seepage from Canals	Subsurface Inflow	Total Inflow	Subsurface Outflow	Groundwater Pumping	Total Outflow	
Levee Improvements[2]									
Sacramento River East Levee	-63	-884	0	0	**-947**	0	0	**0**	-
NCC South Levee	-4	0	0	-56	**-60**	0	0	**0**	-
PGCC West Levee	-39	0	0	0	**-39**	-238	0	**-238**	-
NEMDC West Levee (North)	0	0	0	0	**0**	-378	0	**-378**	-
NEMDC West Levee (South)	0	0	0	0	**0**	-466	0	**-466**	-
American River North Levee	0	-211	0	0	**-211**	0	0	**0**	-
Subtotal	**-105**	**-1,095**	**0**	**-56**	**-1,256**	**-1,083**	**0**	**-1,083**	**-173**
Canal Improvements									
New GGS/Drainage Canal	-11	0	162	0	**151**	0	0	**0**	-
West Drainage Canal	0	0	128	0	**127**	0	0	**0**	-
Elkhorn Canal relocation	-11	0	27	0	**16**	0	0	**0**	-
Riverside Canal relocation	-19	0	10	0	**-9**	0	0	**0**	-
Subtotal	**-41**	**0**	**327**	**0**	**285**	**0**	**0**	**0**	**285**
Borrow Sites									
Airport North	0	0	0	0	**0**	0	0	**0**	-
Brookfield	-30	0	0	0	**-30**	76	-1,625	**-1,549**	-
Fisherman's Lake	-36	0	0	0	**-36**	0	0	**0**	-
Subtotal	**-67**	**0**	**0**	**0**	**-67**	**76**	**-1,625**	**-1,549**	**1,483**
Total	**-213**	**-1,095**	**327**	**-56**	**-1,037**	**-1,007**	**-1,625**	**-2,632**	**1,595**

1. Increased groundwater inflow (or decreased outflow) shown as a positive value; increased outflow (or decreased inflow) is shown as negative.
2. Effect of slurry cutoff walls represent existing/2004 results from Table 6-6.

Table 7-2
Groundwater Budget for Proposed SAFCA Construction Activities Based on Future (2030) Conditions

SAFCA Construction Activity	Inflow (afy)[1]					Outflow (afy)[1]			Change in Storage (afy)
	Deep Percolation	Net Recharge from Streams	Seepage from Canals	Subsurface Inflow	Total Inflow	Subsurface Outflow	Groundwater Pumping	Total Outflow	
Levee Improvements[2]									
Sacramento River East Levee	-63	-992	0	0	**-1,055**	0	0	**0**	-
NCC South Levee	-4	0	0	-480	**-484**	0	0	**0**	-
PGCC West Levee	-39	0	0	0	**-39**	-13	0	**-13**	-
NEMDC West Levee (North)	0	0	0	0	**0**	-21	0	**-21**	-
NEMDC West Levee (South)	0	0	0	0	**0**	-26	0	**-26**	-
American River North Levee	0	97	0	0	**97**	0	0	**0**	-
Subtotal	**-105**	**-895**	**0**	**-480**	**-1,480**	**-60**	**0**	**-60**	**-1,420**
Canal Improvements									
New GGS/Drainage Canal	-11	0	162	0	**151**	0	0	**0**	-
West Drainage Canal	0	0	128	0	**127**	0	0	**0**	-
Elkhorn Canal relocation	-11	0	27	0	**16**	0	0	**0**	-
Riverside Canal relocation	-19	0	10	0	**-9**	0	0	**0**	-
Subtotal	**-41**	**0**	**327**	**0**	**285**	**0**	**0**	**0**	**285**
Borrow Sites									
Airport North	0	0	0	0	**0**	0	0	**0**	-
Brookfield	-30	0	0	0	**-30**	76	-1,625	**-1,549**	-
Fisherman's Lake	-36	0	0	0	**-36**	0	0	**0**	-
Subtotal	**-67**	**0**	**0**	**0**	**-67**	**76**	**-1,625**	**-1,549**	**1,483**
Total	**-213**	**-895**	**327**	**-480**	**-1,261**	**16**	**-1,625**	**-1,609**	**348**

1. Increased groundwater inflow (or decreased outflow) shown as a positive value; increased outflow (or decreased inflow) is shown as negative.
2. Effect of slurry cutoff walls represent 2030 results from Table 6-6.

Table 7-3
Groundwater Budget for Natomas Basin Showing Effect of SAFCA Activities on Existing Groundwater Conditions (Based on 2004 Simulation)

	Water Budget Component	2004 Simulation[1] (afy)	Impact of SAFCA Activities (afy)	2004 Simulation Plus SAFCA Activities (afy)
Inflow	Deep Percolation (Including Canal Seepage)	31,429	114	31,543
	Recharge from Sacramento River	6,469	-884	5,585
	Recharge from American River	1,086	-211	875
	Boundary Inflow from West	10,365	0	10,365
	Subsurface Inflow from North	241	-56	185
	Subsurface Inflow from South	2,714	0	2,714
	Total Inflow	**52,304**	**-1,037**	**51,267**
Outflow	Groundwater Pumping	35,537	-1,625	33,912
	Subsurface Outflow to East	21,738	-1,007	20,731
	Total Outflow	**57,275**	**-2,632**	**54,643**
Inflow minus Outflow	**Change in Storage**	**-4,971**	**1,595**	**-3,376**

1. Based on final year (2004) of calibration simulation (LSCE, 2008b).

Table 7-4
Groundwater Budget for Natomas Basin Showing Effect of SAFCA Activities on Future Groundwater Conditions (Based on 2030 Simulation)

	Water Budget Component	2030 Simulation[1] (afy)	Impact of SAFCA Activities (afy)	2030 Simulation Plus SAFCA Activities (afy)
Inflow	Deep Percolation (Including Canal Seepage)	27,187	114	27,301
	Recharge from Sacramento River[2]	1,100	-992	108
	Recharge from American River	-500	97	-403
	Boundary Inflow from West	3,700	0	3,700
	Subsurface Inflow from North	3,700	-480	3,220
	Subsurface Inflow from South	0	0	0
	Total Inflow	**35,187**	**-1,261**	**33,926**
Outflow	Groundwater Pumping	31,615	-1,625	29,990
	Subsurface Outflow to East	1,200	16	1,216
	Subsurface Outflow to South	800	0	800
	Total Outflow	**33,615**	**-1,609**	**32,006**
Inflow minus Outflow	**Change in Storage**	**1,572**	**348**	**1,920**

1. Based on 1982-2004 average for Sutter Pointe Project Scenario 2B (LSCE, 2008b).

8.0 Effects on Groundwater Quality and Private Wells

8.1 Potential Groundwater Quality Impacts

The primary potential groundwater quality impact of SAFCA's proposed construction activities is a slight reduction in groundwater recharge to the Natomas Basin, including stream recharge and deep percolation from rice fields and other irrigated farmland. This recharge is generally of high quality, especially the stream recharge, which typically has very low salinity and few contaminants. Seepage from canals is another source of good quality recharge, and this will increase due to SAFCA's proposed canal construction. Water recharged via deep percolation has somewhat higher salinity than river water due to the use of recycled tailwater and the effects of ET.

As estimated above, the combined effect of SAFCA's proposed construction activities on existing groundwater conditions would be to reduce low-salinity recharge from rivers and canals by 768 afy and reduce groundwater outflow beneath the PGCC and NEMDC by 1,007 afy. The combined effect of these inflow and outflow reductions would be expected to slightly increase salt accumulation in the Natomas Basin and have a small effect on groundwater quality east of the Natomas Basin. However, these reductions represent less than two percent and five percent of the total estimated groundwater inflow and outflow to and from the Natomas Basin, and the water quality impacts are not expected to be measurable.

For future groundwater conditions in 2030, the combined effect of SAFCA's proposed construction activities would be to reduce low-salinity groundwater recharge from rivers and canals by 568 afy and groundwater outflow to the east by 16 afy. Again, the overall effect of these changes on future groundwater quality would be small.

In the vicinity of the Brookfield borrow site, groundwater quality would improve due to the transition from groundwater to surface water for about 80 percent of the rice acreage. Groundwater quality would improve in this area because deep percolation from fields irrigated with surface water will have lower salinity than from fields irrigated with groundwater.

The slurry cutoff walls will be constructed primarily of soil mixed with bentonite, but Portland cement may be used as an additive in some cases. Bentonite is a naturally occurring form of clay, and Portland cement is made from limestone and clay. Neither bentonite nor cured Portland cement are water soluble, and grouts composed of both materials are widely used in the water well industry. Both bentonite and cement are used to construct seals in wells drilled for various purposes, including drinking water supply. No groundwater contamination would be expected due to construction of the proposed slurry cutoff walls and other improvements proposed for the levees surrounding the Natomas Basin.

Although SAFCA's proposed construction activities would cause slight groundwater quality impacts in some areas and improvements in other areas, the effects would be too small to be

measurable. The overall effect of SAFCA's proposed construction on future groundwater quality in the Natomas Basin can be considered negligible.

8.2 Potential Impacts to Private Wells

8.2.1 Private Well Locations and Construction

For the *Sacramento River Basinwide Water Management Plan*, DWR reviewed drillers' logs in the Natomas Basin and reported that average well depths were 149 feet for domestic wells, 313 feet for irrigation wells, 378 feet for industrial wells, and 308 feet for municipal wells (DWR, 2003c). The majority of the wells in the Natomas Basin are either domestic or agricultural wells, which typically extract groundwater from the upper aquifer system as defined above.

Figure 8-1 shows wells with known or estimated locations in and near the Natomas Basin. "Private wells" shown along the Sacramento River East Levee and the NCC South Levee are primarily domestic wells mapped by M&H (Stephen Sullivan, pers. comm., January 23, 2008) but include some irrigation wells. Well numbers provided for these wells correspond to numbers assigned by M&H. Similar mapping of private wells along the PGCC and NEMDC West Levees is still in progress, and well locations along the eastern edge of the Natomas Basin shown on **Figure 8-1** are estimated based on parcel boundaries. Only a portion of the estimated well locations in the Valley View Acres (VVA) community, located along the NEMDC north of Del Paso Road and east of Sorento Road, are shown on the map due to the high density of domestic wells in this area.

In addition to domestic wells, **Figure 8-1** also shows wells with water level data mapped by LSCE based on locations provided by DWR and other sources. Symbols used for these wells indicate the depth zone (upper, lower, multiple, and unknown). Most of these are agricultural wells, M&I wells, or monitoring wells. If available, the wells are numbered based on the last four digits of the State Well Number.

Approximately 138 private wells along the Sacramento River East Levee have been mapped by M&H (2008), and these are grouped by depth and type in **Table 8-1**. There are 103 domestic wells, 15 irrigation wells, and 20 wells used for other or unknown purposes in this area. Monitoring and municipal wells are not included on this table. All of the domestic wells are less than 300 feet deep, and 84 percent are between 100 and 200 feet deep. All but one of the irrigation wells are also less than 300 feet deep, with six wells between 100 and 200 feet deep and eight wells between 200 and 300 feet deep. The average depth of the private wells along the Sacramento River East Levee is 158 feet. As reported by LSCE (2008a), approximately two-thirds of these wells are located on the river side of the levee and one-third on the land side. The average depth of these wells is 151 feet on the river side of the levee and 163 feet on the land side. The land side wells are slightly deeper on average because they include more irrigation wells.

As shown in **Table 8-1**, nine wells along the NCC South Levee were mapped by M&H (2008). These include one domestic well and eight irrigation wells. The domestic well is between 100 and 200 feet deep. One of the irrigation wells is between 100 and 200 feet deep, three are

between 200 and 300 feet deep, two are between 300 and 400 feet deep, and two are of unknown depth. The average depth of wells with depth information is 260 feet.

There are about 150 residences in the VVA community, situated on about 300 acres of land west of the NEMDC. The VVA community is supplied by groundwater, and each residence is assumed to have a domestic well. Compilation of construction information for these wells is still in progress, but M&H has provided drillers' logs for 27 VVA wells to date. These wells range in depth from 65 to 290 feet, with an average of 122 feet. Most of the drillers' logs do not show the perforated interval, but it is expected to be below the depth of the cutoff wall proposed for this portion of the NEMDC West Levee (53 feet) for almost all wells.

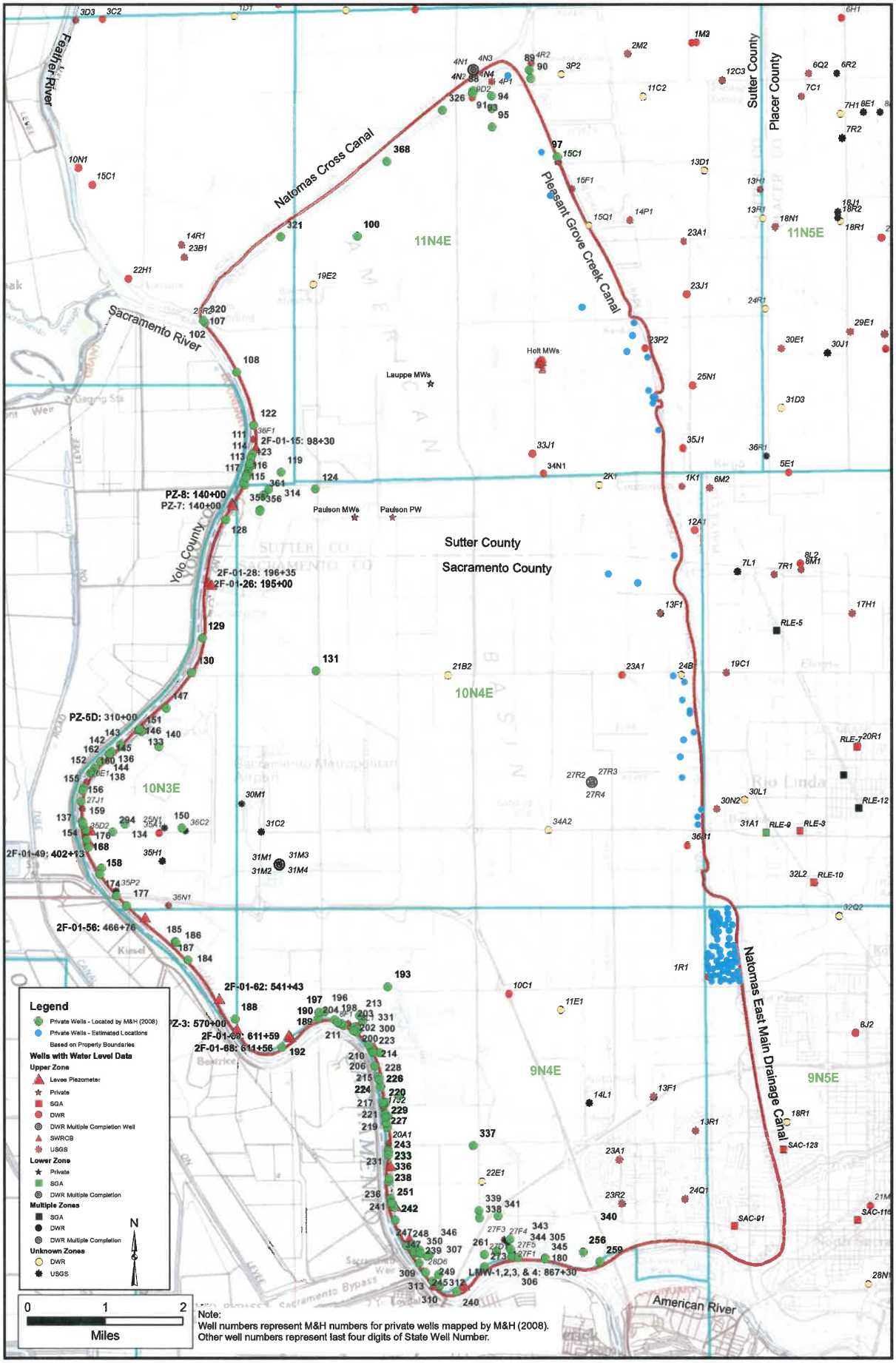
8.2.2 Potential Impacts

Kleinfelder (2009) estimated the water level changes due to the slurry cutoff walls along the Sacramento River East Levee using the steady-state and transient versions of the seepage model discussed above. The transient version of the model is considered to be more accurate, and the changes in head due to the proposed slurry cutoff wall along one reach of the Sacramento River East Levee predicted by the transient model are shown on **Figure 8-2**. On the river side of the levee, the predicted effects of the cutoff walls are negligible at low stage, and there would be a slight increase in head (less than one foot) at high stage. On the land side of the levee, the Kleinfelder simulation shows that heads would be from one to 6.5 feet lower (average of 2.2 feet) due to the cutoff wall during the winter months when the direction of groundwater flow is away from the River. During the rest of the year, the direction of groundwater flow is toward the River because gaining conditions are simulated with the model. Under these conditions, land side groundwater levels are predicted to be up to 1.5 feet higher (average of 0.9 foot) with the cutoff wall in place. These small effects are considered to be negligible even for the shallowest domestic wells (less than 100 feet deep). No measurable decreases in well yields or increases in pumping costs are expected due to slurry cutoff walls along the Sacramento River East Levee.

Similar modeling has not been conducted for wells along the PGCC or NEMDC, but cutoff walls would be expected to have similarly small effects near the eastern edge of the Natomas Basin. Since the general direction of groundwater flow in this area is to the east, static groundwater levels will increase slightly west of the levee and decrease slightly east of the levee. Shallow wells on either side of the levee could experience slightly lower pumping water levels because the cutoff wall will act as a low permeability boundary that will reduce the aerial extent and increase the depth of the cone of depression. This effect will be small because the production zone for most wells is below the bottom of the proposed cutoff walls. No measurable decreases in well yields or increases in pumping costs are expected due to the slurry cutoff walls. Overall, no measurable effects on groundwater levels or quality are expected for wells in or near the Natomas Basin due to SAFCA's proposed construction activities.

Table 8-1
Depths of Private Wells Along Sacramento River East Levee and Natomas Cross Canal South Levee

Levee	Well Type	Well Depth						Total
		0-100 ft	100-200 ft	200-300 ft	300-400 ft	> 400 ft	Unknown	
Sacramento River East Levee	Domestic	10	87	6	0	0	0	103
	Irrigation	0	6	8	0	1	0	15
	Other/Unknown	6	6	6	0	0	2	20
	Subtotal	**16**	**99**	**20**	**0**	**1**	**2**	**138**
Natomas Cross Canal South Levee	Domestic	0	1	0	0	0	0	1
	Irrigation	0	1	3	2	0	2	8
	Subtotal	**0**	**2**	**3**	**2**	**0**	**2**	**9**
Total		**16**	**101**	**23**	**2**	**1**	**4**	**147**



FILE: \\server_pe2900\Public\SAFCA\GIS\Well Location map.mxd Date: 5/4/2009

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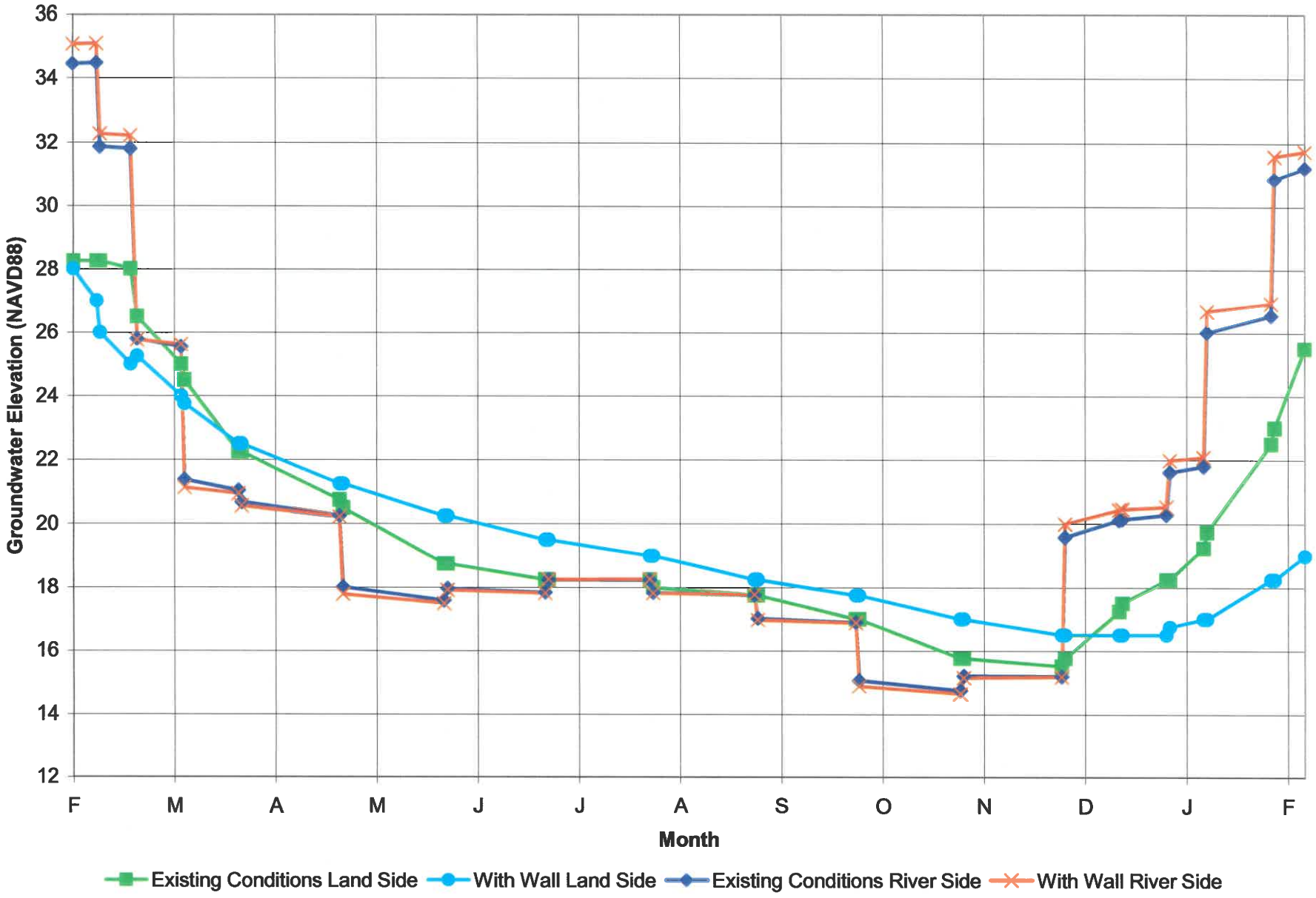
Figure 8-1
Wells In and Near the Natomas Basin



Y:\SAFCA\Cutoff Wall Impacts (2009)\plate 25_05-01-09.xls\Est (3W Table Ele

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Figure 8-2
Simulated Groundwater Elevations from Kleinfelder Transient Model With and Without Slurry Cutoff Walls

9.0 Summary of Potential Impacts

Most of SAFCA's proposed levee improvements will have no effect on groundwater in the Natomas Basin, but the proposed slurry cutoff walls are intended to reduce seepage beneath the levees and will affect groundwater conditions. Some of SAFCA's construction activities will involve land use changes that will reduce groundwater recharge. This reduction will be at least partially offset by seepage from new and relocated canals, which will increase groundwater recharge. Finally, water supply changes at the Brookfield property borrow site will result in a large reduction in groundwater pumping.

The effects of SAFCA's proposed construction activities on groundwater conditions in the Natomas Basin were evaluated using the water budget approach and other methods discussed above. Potential impacts resulting from land use changes and canal construction were addressed in Chapter 5, potential impacts due to proposed slurry cutoff walls were addressed in Chapter 6, and the potential cumulative impacts were addressed in Chapter 7. The analysis of potential impacts to groundwater quality and private wells was discussed in Chapter 8. Each of these potential impacts is summarized below.

9.1 Potential Water Budget Impacts

9.1.1 Levee Improvements

Groundwater impacts from proposed levee improvements are primarily limited to the effects of land use changes and slurry cutoff walls. No direct groundwater impacts are expected from increasing the height or width of levees, modifying levee slopes, building seepage berms, or other construction above the water table.

Proposed land use changes for all five levees will result in the loss of about 75 acres of existing rice, 175 acres of field crops, and five acres of orchard. These changes are estimated to reduce deep percolation from applied water by a total of 105 afy.

Groundwater flow reductions due to the slurry cutoff walls were estimated based on simulations of "existing" (or 2004) and future (2030) conditions. The combined effect of all proposed slurry cutoff walls along the levees surrounding the Natomas Basin for existing/2004 conditions is estimated to reduce groundwater inflow by 1,256 afy and groundwater outflow by 1,083 afy, resulting in a reduction in groundwater storage in the Natomas Basin of about 173 afy (**Table 7-1**). For 2030 conditions, groundwater inflow is predicted to be reduced by 1,480 afy and groundwater outflow by 60 afy, resulting in a reduction in groundwater storage of about 1,420 afy (**Table 7-2**).

9.1.2 Canal Improvements

The construction of the new GSS/Drainage Canal and relocation and improvements to the West Drainage Canal, the Elkhorn Canal, and the Riverside Canal will affect deep percolation from

applied water (due to land use changes) and seepage from the canals. For all four canals, deep percolation is estimated to decrease by 41 afy and canal seepage is estimated to increase by 327 afy. The net effect of proposed canal construction would be to increase groundwater storage in the Natomas Basin by about 285 afy (**Tables 7-1** and **7-2**).

9.1.3 Borrow Sites

Excavation of two of the three primary borrow sites is expected to have an indirect effect on groundwater conditions due to proposed land use and water supply changes. At the Brookfield borrow site, approximately 325 acres are currently planted to rice, and SAFCA plans to restore about 286 acres to rice cultivation after construction activities are complete. At the Fisherman's Lake borrow site, about 400 acres of land would be used for borrow material, including 49 acres currently planted to rice, 266 acres of field crops, and 85 acres of managed marsh. After reclamation, there would be about 175 acres of managed marsh and 225 acres of non-irrigated grassland or woodland. No land use changes are planned at the Airport North Bufferlands borrow site due to airport safety considerations. The predicted net loss in deep percolation for all borrow sites is 67 afy.

The Brookfield borrow site is currently irrigated entirely with groundwater, but SAFCA plans to provide the infrastructure so that about 80 percent of the borrow site can be irrigated with surface water after reclamation. This transition would reduce groundwater pumping in the Natomas Basin by about 1,625 afy. The reduction in groundwater pumping at the Brookfield site more than offsets the loss of deep percolation at all borrow sites. The reduced pumping would also result in slightly increased groundwater outflow from the northern portion of the Natomas Basin. The net effect of excavation and reclamation of all borrow sites will be to increase groundwater storage by about 1,483 afy (**Tables 7-1** and **7-2**).

9.1.4 Summary of Potential Water Budget Impacts

The combined effects of SAFCA's proposed construction activities for both existing and future conditions include estimated decreases in deep percolation (213 afy) and groundwater pumping (1,625 afy) and an increase in seepage from canals (327 afy). The effect on other water budget components varies between the existing/2004 and future/2030 simulations. For the existing/2004 period, there are predicted decreases in net recharge from streams (1,095 afy), subsurface inflow (56 afy), and subsurface outflow (1,083 afy), and groundwater storage is estimated to increase by 1,596 afy. This means that groundwater levels in the Natomas Basin would be expected to increase slightly due to SAFCA's construction activities. The estimated reduction in subsurface outflow (1,007 afy) would result in a small decrease in groundwater levels and storage east of the Natomas Basin.

For the 2030 period, decreases in groundwater inflow include net recharge from streams (895 afy) and subsurface inflow (480 afy). There would be a smaller increase groundwater storage (348afy) and a small increase in subsurface outflow (16 afy) as compared to the existing/2004 simulation. These changes would have a slight positive effect on groundwater levels in or near the Natomas Basin.

The cumulative impacts of SAFCA's proposed construction activities on existing and future groundwater conditions were based primarily on the 2004 and 2030 IGSM simulations discussed in Chapter 4. The 2004 simulation results show a reduction in groundwater storage of 4,971 afy in the Natomas Basin without SAFCA's construction; this equates to an average head decline of about one foot. The decrease in groundwater storage would be smaller (3,376 afy) due to SAFCA's construction activities. Subsurface outflow from the Natomas Basin to the east would decrease from 21,738 to 20,731 afy due to SAFCA's activities. Overall, SAFCA's activities would have a small positive impact on groundwater supplies in the Natomas Basin and a small negative impact on groundwater conditions east of the Natomas Basin.

The 2030 IGSM simulation provides an estimate of the cumulative impacts of SAFCA's construction activities on future groundwater conditions. The results of the 2030 simulation show a positive change in groundwater storage in the Natomas Basin of 1,572 afy, which would increase slightly to 1,920 afy due to SAFCA's activities. There would be a very small increase in groundwater outflow (from 1,200 to 1,216 afy). Overall, the cumulative impact of SAFCA's proposed construction activities on future groundwater levels in and near the Natomas Basin is predicted to be slightly positive.

9.2 Potential Water Quality Impacts

This investigation also included a summary of potential impacts to groundwater quality due to SAFCA's construction activities. The primary potential groundwater quality impact will be a slight reduction in groundwater recharge to the Natomas Basin, including stream recharge and deep percolation from rice fields and other irrigated farmland. This recharge is generally of high quality, especially the stream recharge, which has very low salinity. Seepage from canals is another source of good quality recharge, and increased seepage due to SAFCA's proposed canal construction will offset some of the reductions in groundwater recharge due to slurry cutoff walls. In the vicinity of the Brookfield borrow site, groundwater quality would improve due to the transition from groundwater to surface water for about 80 percent of the rice acreage. No groundwater contamination would be expected due to construction of the proposed slurry cutoff walls and other improvements proposed for the levees surrounding the Natomas Basin.

SAFCA's proposed construction activities would cause slight groundwater quality degradation in some areas and improvements in other areas. The overall effect would likely be a slight increase in salt accumulation in the aquifers underlying the Natomas Basin. However, this impact would be too small to be measurable.

9.3 Potential Impacts to Private Wells

The majority of the domestic wells along the Sacramento River East Levee are between 100 and 200 feet deep, and irrigation wells in this area are slightly deeper. The average depth of the domestic and irrigation wells along the Sacramento River East Levee is 158 feet. Evaluation of well construction along the PGCC and NEMDC is still in progress, but there are about 150 residences in the VVA community with mostly shallow domestic wells. The drillers' logs for wells in this area that have been cataloged to date show an average well depth of 122 feet. Most of the drillers' logs do not show the perforated interval, but it is expected to be below the depth

of the cutoff wall proposed for this portion of the NEMDC West Levee (53 feet) for almost all wells.

Kleinfelder estimated the water level changes due to the slurry cutoff walls along the Sacramento River East Levee using the SEEP/W groundwater model. On the river side of the levee, the predicted effect of the cutoff wall is negligible at low stage, and there would be a slight increase in head (less than one foot) at high stage. On the land side of the levee, the model results show that, on average, heads would be about 2.2 feet lower during the winter months and 0.9 foot higher during the rest of the year with the cutoff wall in place. In both cases, any impacts would be small enough to be considered negligible even for the shallowest domestic wells (less than 100 feet deep). No measurable decrease in groundwater levels or well yields or increase in pumping costs is expected due to the slurry cutoff walls.

Although similar modeling has not been conducted for wells along the PGCC or NEMDC, cutoff walls would be expected to have similarly small effects in this area. Static groundwater levels will increase slightly west of the levee and decrease slightly east of the levee. Shallow wells on either side of the levee could experience slightly lower pumping water levels because the cutoff wall will act as a low permeability boundary. This effect will be small because the production zone for most wells is below the depth of the proposed cutoff walls. No measurable decreases in well yields or increases in pumping costs are expected due to slurry cutoff walls. Overall, no measurable effects on groundwater levels or quality are expected for wells in or near the Natomas Basin due to SAFCA's proposed construction activities.

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APPENDIX B

Evaluation of Cutoff Walls

(updated from the 12/19/07 version included in the Phase 3 DEIS/DEIR)

December 19, 2007
Revised April 21, 2009
File No.: 72834

Mr. Timothy Washburn
SAFCA
1007 7th Street, 7th Floor
Sacramento, CA 95814

Subject: **Evaluation of Cutoff Walls Impact on Groundwater Recharge**
Sacramento River East Levee
Natomas Levee Improvement Project
Sacramento and Sutter Counties, California

Dear Mr. Washburn:

This Memorandum is a revised version of a draft memorandum submitted to you on December 19, 2007. The analyses and data presented in December 2007 memo have been converted to the North American Vertical Datum (NAVD 88). The updated memorandum does not reflect any changes to the proposed remedial design and/or site subsurface characterization model that may have occurred since December 2007.

One of the design alternatives considered for remediation of the Sacramento River East Levee from Reach 1 to Reach 20 includes construction of cutoff walls through an adjacent levee. These soil-bentonite (SB) walls are proposed to mitigate underseepage concerns and reduce exit seepage gradients to the acceptable levels, according to the established project criteria.

A concern has been raised that the SB walls could potentially impede seepage from the river through the levee foundation and adversely impact groundwater recharge landward of the levee. To address these concerns, we have performed simplified seepage analyses to estimate seepage flow from the river into the aquifer under both existing conditions and with cutoff walls in place.

Based on the design recommendations provided by Kleinfelder, the SB wall material should have permeability of about $5x10^{-7}$ cm/sec or lower and will extend at least 5 feet into a fine grained layer(s) underneath the permeable near surface foundation layer. To account for the variability of the slurry and the potential for construction defects, for this study the SB wall was modeled with and average overall permeability of $1x10^{-6}$ cm/sec.

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In addition, we have evaluated potential seepage loss from the proposed Giant Garter Snake ditch. This new 2 mile long unlined canal will be located approximately 500 to 1,000 feet landward of the levee toe and will follow the existing levee alignment between Stations 200+00 and 305+00. In general, the canal will be filled with water during summer month and will be dry during the winter months. During periods of time when the canal is filled with water, seepage through its bottom and side slopes may temporarily affect the groundwater table in the area.

General Assumptions

- Idealized stratigraphic models at Stations 27+00, 70+00, 217+00, and 353+00 were selected to represent the range of subsurface conditions along the Sacramento River East Levee. Analyses at Station 217+00 are based on the stratigraphy model developed by URS, as presented in the URS "Draft Subsurface Investigation Report for Sacramento River East Levee, Natomas General Reevaluation Report" prepared for US Army Corps of Engineers, Sacramento District, dated 18 July 2007. Analyses at Stations 27+00, 70+00, and 353+00 are based on the models developed by Kleinfelder as presented in the Draft Basis of Design Report (Kleinfelder, 2007).
- Total length and location of the SB wall were estimated based on the information provided in the Final Draft Basis of Design Report dated December 18, 2007 and in the Alternatives Analysis Report for Seepage Mitigation Revision 1 dated September 24, 2007. Two representative cross-sections (Stations 70+00 and 353+00) have been selected to represent the proposed wall locations and depths.
- Seepage analyses were completed using steady state and transient analysis procedures with the finite element program SEEP/W version 6.17, provided with the GeoStudio 2004 package. These analyses do not account for 3-D effects, such as flow around the cutoff wall.
- Typical seasonal river level fluctuations were estimated based on the information provided by the Department of Water Resources (DWR), Division of Flood Management (http://cdec.water.ca.gov/queryStation.html) for the Sacramento River gage at Verona. River stage data recorded at Verona from 11/26/1995 to 11/26/2007 are presented on Plates 1 through 5 and summarized in a tabular form on Plate 6.
- Elevation of the groundwater table landward of the levee was estimated based on piezometer data obtained from "Final Observation Wells Report II: for Reaches North and South of Powerline Road", prepared by URS.
- All elevations in this memorandum are referenced in North American Vertical Datum (NAVD 88). Elevations referenced in previous reports and other sources of information are based on the National Geodetic Vertical Datum (NGVD 29). To correct from NGVD29 datum to NAVD88 datum elevations should be adjusted by 2.28 feet (NAVD88 = NGVD29 + 2.28 feet).
- River gage data reported by DWR was in the United States Engineering Datum (USED). In the Sacramento and San Joaquin River Basins, the adjustment from USED to NGVD29 varies from gaging station to gaging station within a range of 2.48 feet to 3.2 feet. According to the DWR website, the commonly used adjustment, when not otherwise known, is 3.0 feet. Elevations reported in USED

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are approximately 3 feet higher than elevations reported in NGVD29 and 0.72 feet lower than elevations reported in NAVD88.

- Seepage parameters selected for this study are consistent with those presented in the Basis of Design Report. Permeability values used in each analysis case are shown on plates presenting the results.
- Only recharge due to seepage from the river was considered. The model does not account for flow into or out of the system due to precipitation, pumping or regional groundwater flow that maybe occurring from a direction parallel to the levee axis.

Analysis Approach

We have performed simplified seepage analyses to estimate seepage flow from the river into the aquifer under both existing conditions and with cutoff walls in place we have further evaluated the impact of the proposed canal construction and operation based on the methodology outlined below. The following sections of this memo discuss analysis assumptions and details and present the results.

1. Review available historical data and develop representative average river level and ground water table hydrographs.
2. Perform series of steady state seepage analyses at four representative cross-sections to estimate seepage through levee foundation under the existing conditions as a function of river elevation. Boundary conditions used in steady state seepage modeling simulations are defined below. Fixed-head boundary conditions set to the water surface elevations were applied along the boundary nodes of the upstream slope, river bottom, and the upstream (riverside) vertical edge of the model. Nodes along the bottom of the model were modeled as no flow boundary (zero total flux boundary condition). Infinite elements with fixed-head boundary conditions were used along the right vertical edge of the model. The total head along the vertical edge was set to an estimated groundwater table elevation landward of the levee. The landside slope of the levee and the ground surface were modeled as potential seepage exit surfaces.
3. Using results from Steps 1 and 2 for each representative cross-section estimate seepage flow under the existing conditions over a typical year report seepage quantities in acre-feet per year per 1,000 feet of levee.
4. Using results from Step 3 and subsurface condition profiles at the landside toe of the levee, estimate seepage flow under the existing conditions over the entire length of the levee. Report seepage quantities in acre-feet per year.
5. Perform series steady state seepage analyses at two representative cross-sections (Stations 70+00 and 353+00) to estimate seepage through the levee foundation with a cutoff wall in place as a function of river elevation.
6. Using results from Steps 1 and 5, for Stations 70+00 and 353+00 estimate seepage flow with a cutoff wall in place over a typical year. Report seepage quantities in acre-feet per year per 1,000 feet of levee.
7. Using results from Steps 4 and 6, calculate reduction in seepage quantities at Stations 70+00 and 353+00 due to the cutoff wall.

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8. Using river and groundwater table hydrographs from Step 1, perform transient seepage analyses at Station 70+00 with and without the cutoff wall. The purpose of this analysis is two-fold: 1) better understand the impact of the cutoff wall on the recharge of the aquifer throughout the year; 2) verify percent reduction estimated based on the steady state analysis.
9. Using results from Steps 4 and 7 and subsurface condition profiles at the landside toe of the levee, estimate impact of the cutoff wall construction over the entire length of the levee. Report seepage quantities in acre-feet per year.
10. Perform transient analysis at Station 70+00 with the cutoff wall and canal to estimate seepage from the canal during a typical year.

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Analysis Results

Step1

Historical data recorded by the Sacramento River gage station at Verona from 11/26/1995 to 11/26/2007 are plotted on Plates 1 through 5. We have estimated typical number of days per year that river level remains at a given elevation as presented on Plate 6. The water surface rarely exceeds Elevation 35. The highest water surface included in our analyses was El. 34.25. Based on historical data, the water surface remains at this level approximately 1% of the year. We have also developed a representative (approximately average) annual river hydrograph (river level as a function of time) as shown graphically on Plate 7 and in tabular format on Plate 8. Transient seepage analyses utilized this hydrograph as a time-dependent boundary condition on the river side of the model.

Data from piezometer 2F-01-15N located north of Powerline Road indicates that the ground water elevation varies throughout the year from about 5 to 15 feet below ground level (see Attachment A). Based on the piezometer data, we have developed a representative groundwater table hydrograph as shown on Plate 7. Transient seepage analyses utilized this hydrograph as a time-dependent boundary condition on the landside of the model. For our steady state analyses we have set the groundwater table at 7 feet below ground surface, or Elevation 17.25.. Our assumption of Elevation 17.25 is also supported by the groundwater contour maps from County of Sacramento, Department of Water Resources for the spring and fall. The groundwater contours immediately landward of the levee near Reach 4B indicate groundwater elevations greater than 10 feet but generally less than 20.

Steps 2 and 3

Estimated seepage quantities through the levee foundation as a function of river elevation under the existing conditions (no cutoff wall) at Stations 27+00, 70+00, 217+00, and 353+00 are summarized in Table 1 and presented on Plate 9. A range of river levels above the ground water table was considered in the analyses. As discussed in Step 1, the highest river level considered was El. 34.25. Seepage analyses results for WSE at Elevation 34.25 are presented graphically on Plates 10 through 13. As shown in Table1 and graphically on Plate 9, the seepage quantities increase two orders of magnitude as the river level rises from Elevation 17.25 to 34.25. These results also indicate Station 217+00 provides the greatest contribution to the aquifer recharge landward of the levee. For a given river stage, estimated seepage quantities at Station 217+00 are approximately 100 times greater than the estimated quantities at the other three stations. Seepage quantities at Stations 27+00, 70+00, and 353+00 are approximately the same order of magnitude. The higher seepage quantities at Station 217+00 are primarily due to the presence of thick highly permeably sand and gravel layers in the foundation.

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The second result worth noting is the aquifer only recharges when the river level is above the groundwater elevation. When the river elevation is below the groundwater table (Elevation 17.25), the direction of the seepage flow in the model is reversed, indicating flow out of the aquifer.

Table 1
Estimated Seepage Quantities Versus River Stage
Existing Conditions

Model Elevation	27+00 Flow Existing Conditions	70+00 Flow Existing Conditions	217+00 Flow Existing Conditions	353+00 Flow Existing conditions
17.25	-4.98E-11	8.61E-03	1.51E+00	-3.69E-12
18.25	8.53E-02	4.31E-02	6.06E+00	3.88E-01
19.25	1.71E-01	7.75E-02	1.21E+01	7.78E-01
20.25	2.56E-01	1.12E-01	1.82E+01	1.17E+00
21.25	3.41E-01	1.46E-01	2.42E+01	1.56E+00
22.25	4.26E-01	1.81E-01	3.03E+01	1.95E+00
23.25	5.13E-01	2.15E-01	3.63E+01	2.35E+00
24.25	5.99E-01	2.50E-01	4.24E+01	2.74E+00
25.25	6.84E-01	2.85E-01	4.85E+01	3.14E+00
26.25	7.70E-01	3.19E-01	5.45E+01	3.53E+00
27.25	9.24E-01	3.54E-01	6.07E+01	3.92E+00
28.25	1.08E+00	3.89E-01	6.68E+01	4.87E+00
29.25	1.43E+00	5.17E-01	7.33E+01	6.09E+00
30.25	1.93E+00	8.47E-01	7.97E+01	7.47E+00
31.25	2.60E+00	1.40E+00	8.62E+01	9.05E+00
32.25	3.26E+00	2.10E+00	9.28E+01	1.08E+01
33.25	4.08E+00	2.99E+00	9.95E+01	1.28E+01
34.25	5.07E+00	4.21E+00	1.06E+02	1.51E+01
Total Flux Acre ft/yr/1000ft	3.9	2.6	129.4	13.2

Notes: 1. All fluxes in ft^3/day/ft unless noted otherwise.
2. Elevations in the seepage models were adjusted to a nearest mesh node. Model Elevations are lower than elevations in NAVD88 by 0.03 feet.

Step 4

The total length of the Sacramento River East Levee between Station 0+00 (Reach 1) and Station 960+00 (Reach 20) is approximately 18.1 miles. The general profile for the subsurface conditions along the levee crown/landside toe is provided in Attachment B. In general, the subsurface conditions profile is comprised of five units. These strata listed in order of increasing depth include: existing levee, surficial clay/fine grain soil blanket, silty and clayey sand layer, clean sand layer, gravel layer, and a lower clay/lower permeability soil region. As shown in Table 2, conditions at Station 27+00 are representative of approximately 1.8 miles or 11 percent of the entire length of the Sacramento River East Levee. Conditions at Station 70+00 are representative of

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approximately 4 miles or 23 percent of the entire length of the Sacramento River East Levee. Conditions at Station 217+00 are representative of approximately 7.6 miles or 42 percent of the entire length of the Sacramento River East Levee. Conditions at Station 353+00 are representative of approximately 4.7 miles or 24 percent of the entire length of the Sacramento River East Levee. Accordingly, the total estimated flow from the Sacramento River through the levee foundation between Station 0+00 and Station 960+00 is approximately 5,650 acre-feet per year.

Table 2
Estimated Seepage Quantities, Entire East Levee
Existing Conditions

Reach	Stations	Representative Station	Length of Stretch (ft)	Seepage without Cutoff Wall (ac-ft/yr)
1	00+00 to 48+00	27+00	4,800	19
2	48+00 to 100+00	70+00	5,200	14
3	100+00 to 110+00	70+00	1,000	3
4a	110+00 to 120+00	70+00	1,000	3
4a	120+00 to 190+00	353+00	7,000	95
4b	190+00 to 228+00	217+00	3,800	490
5a	228+00 to 263+00	70+00	3,500	10
5b	263+00 to 280+00	27+00	1,700	6
6	280+00 to 330+00	217+00	5,000	650
7	330+00 to 345+00	353+00	1,500	20
7	345+00 to 362+00	353+00	1,700	23
8	362+00 to 402+00	353+00	4,000	55
9a	402+00 to 430+00	353+00	2,800	38
9b	430+00 to 468+10	353+00	3,810	50
10	468+10 to 495+00	217+00	2,690	350
11	495+00 to 635+00	217+00	14,000	1810
12	635+00 to 640+00	217+00	500	65
12	640+00 to 667+00	70+00	2,700	7
13	667+00 to 700+00	353+00	3,300	45
14	700+00 to 732+00	70+00	3,200	8
15	732+00 to 780+00	217+00	4,800	620
16	780+00 to 832+00	217+00	5,200	675
17	832+00 to 842+00	217+00	1,000	130
18	842+00 to 857+00	217+00	1,500	195
19a	857+00 to 875+00	217+00	1,800	235
19b	875+00 to 925+00	70+00	5,000	15
20a	925+00 to 925+50	27+00	50	.2
20b	925+50 to 960+00	27+00	3,450	13
Total Seepage ac-ft/year				**5,650**

Steps 5 and 6

Cutoff soil-bentonite (SB) walls are currently proposed at thirteen locations along the east levee, as summarized in Table 3. The total length of the proposed SB walls is

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approximately 8 miles. The proposed depth of the wall varies from location to location based on the subsurface conditions and the required underseepage mitigation. Idealized cross-sections at Stations 70+00 and 353+00 were selected to represent the range of conditions at the proposed cutoff wall locations. At Station 70+00 where the surficial clay blanket is relatively thin and the underlying permeable layer is relatively shallow, the wall would completely penetrate the sand layer and key into the clay layer beneath. On the other hand at Station 353+00, only a partially penetrating cutoff wall is required. Proposed depth of the wall relative to the estimated bottom of the permeable layer at each location is presented in Table 3.

Table 3
Proposed Cutoff Wall Locations

Reach	Stations	Length of Stretch	Proposed depth of wall, Elevation	Depth of Sand layer, Elevation	Representative station for wall impact evaluation
2	48+00 to 100+00	5,200	-25	-25	70+00
3	100+00 to110+00	1,000	-25	-10	70+00
6	280+00 to 330+00	5,000	-70	-65	70+00
7	330+00 to 362+00	3,200	-60	-50	70+00
8	362+00 to 402+00	4,000	-60	-50	70+00
9	430+00 to 468+00	3,800	-70	-45	70+00
10	468+10 to 495+00	2,690	-25	-70	353+00
13	667+00 to 700+00	3,300	-20	-100	353+00
15	732+00 to 780+00	4,800	-10	-100	353+00
17	832+00 to 842+00	1,000	-25	-100	353+00
18	842+00 to 857+00	1,500	-25	-100	353+00
19a	857+00 to 875+00	1,800	-25	-100	353+00
19b	875+00 to 925+00	5,000	-25	-40	353+00

We have performed a series of steady state seepage analyses to estimate seepage quantities through the levee foundation with an SB wall in place. The analyses results for Stations 70+00 and 353+00 with the river WSE at Elevation 34.25 are presented on Plates 14 and 15. Total flow through a flux section located immediately landward of the SB wall was calculated with and without the cutoff wall in place. The two results were compared to estimate the groundwater recharge effects of the cutoff wall. Seepage quantities as a function of river stage are summarized in Table 4.

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Table 4
Estimated Seepage Quantities versus River Stage
With and Without Cutoff Wall

River Elevation (ft)	70+00 Flow Existing Conditions	70+00 Flow With Cutoff Wall	353+00 Flow Existing Conditions	353+00 Flow With Cutoff Wall
17.25	8.61E-03	4.56E-03	-3.69E-12	-5.97E-13
18.25	4.31E-02	2.29E-02	3.89E-01	3.90E-01
19.25	7.75E-02	4.14E-02	7.78E-01	7.80E-01
20.25	1.12E-01	6.00E-02	1.17E+00	1.17E+00
21.25	1.46E-01	7.87E-02	1.56E+00	1.56E+00
22.25	1.81E-01	9.75E-02	1.96E+00	1.96E+00
23.25	2.15E-01	1.16E-01	2.35E+00	2.35E+00

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Table 4 (Cont.)

River Elevation (ft)	70+00 Flow Existing Conditions	70+00 Flow With Cutoff Wall	353+00 Flow Existing Conditions	353+00 Flow With Cutoff Wall
24.25	2.50E-01	1.36E-01	2.74E+00	2.74E+00
25.25	2.85E-01	1.55E-01	3.14E+00	3.13E+00
26.25	3.19E-01	1.74E-01	3.53E+00	3.52E+00
27.25	3.54E-01	1.93E-01	3.92E+00	3.92E+00
28.25	3.89E-01	2.13E-01	4.87E+00	4.31E+00
29.25	5.17E-01	2.33E-01	6.09E+00	4.70E+00
30.25	8.47E-01	2.54E-01	7.47E+00	5.12E+00
31.25	1.40E+00	2.75E-01	9.05E+00	5.59E+00
32.25	2.10E+00	2.95E-01	1.08E+01	6.06E+00
33.25	2.99E+00	3.16E-01	1.28E+01	6.54E+00
34.25	4.21E+00	3.37E-01	1.51E+01	7.02E+00
Total Flux Acre ft/yr/1000ft	2.6	0.4	13.4	8.4

Notes: 1. All fluxes in ft^3/day/ft unless noted otherwise.
2. Elevations in the seepage models were adjusted to a nearest mesh node.

Step 7

Based on the results of steady state seepage analyses presented in Table 4, the cutoff wall could potentially reduce seepage through the foundation by 40 to 85 percent depending on the subsurface conditions and the proposed depth of the wall. At the locations where the wall fully penetrates the permeable sand layer (Station 70+00) seepage quantities could be reduced by approximately 85 percent. At the locations, where the cutoff is shallow and only partially penetrates the sand layer (Station 353+00), the reduction would be approximately 40 percent.

Step 8

To verify and validate steady state seepage analyses described above, we have performed transient seepage analyses for Station 70+00. The purpose of these analyses was to better understand effects of seasonal groundwater table fluctuations on the estimated seepage quantities with and without the cutoff wall and more accurately model typical river conditions throughout the year. Time-dependent boundary conditions assigned to the riverside and the landside of the model as shown on Plate 16 and summarized in a tabular form on Plate 8 were used in these analyses. Seepage quantity computations were performed at 34 time steps, starting in February and ending a year later.

Transient seepage analyses results are presented on Plates 17 through 20. Existing seepage flow regime during typical winter and summer conditions is illustrated on Plates

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17 and 18 respectively. Seepage conditions with the cutoff wall in place are shown on Plates 19 and 20. The plates show calculated seepage velocity vectors which illustrate the direction and the amount of flow - the larger the arrow, the higher the velocity and the larger the flow. A consistent scale was used on all four plates for easier visual comparison. The results indicate seepage occurs primarily through the permeable foundation sand layer and the existing sand levee. The flow is significantly higher during the elevated river stages (winter). Further, conditions may exist during the year when the river water surface is lower than the groundwater table. During these periods of time, the direction of the flow is reversed indicating seepage flow toward the river as illustrated on Plate 18.

Seepage quantities through the levee foundation with and without the cutoff wall as a function of time are presented on Plate 21. Positive seepage quantities indicate flow from the river landward of the levee while the negative sign indicates flow in the opposite direction. As shown on Plate 21, construction of the cutoff wall impedes flow in both direction and as a result may prevent flow into the river during the summer months.

Based on the transient seepage analyses, flow through the levee foundation at Station 70+00 without the wall is estimated at 5.6 acre-ft/year per 1,000 feet of the levee. Seepage through the levee foundation with the wall in place is approximately 1.7 acre-ft/year per 1,000 feet. Compared to the steady state analyses results for the same station, the transient seepage analyses indicate higher seepage quantities. For example, as shown in Table 4, steady-state seepage quantities estimated for Station 70+00 are 2.6 acre-ft/year per 1,000 feet for the existing conditions and approximately 0.4 acre-ft/year per 1,000 feet of the levee with the cutoff wall in place. The estimated reduction in flow due to the wall is comparable for both types of analyses. Based on the transient analysis, the seepage quantities would be reduced by about 70% compared to 85% estimated from the steady-state seepage analyses. Accordingly, we conclude the steady state seepage analyses conservatively approximate the effect of the cutoff walls.

Step 9

The overall effect of the cutoff wall construction can be estimated based on the information presented in Table 5.

Table 5
Estimated Seepage Quantities through Levee Foundation
Reaches 1 through 20

Reach	Stations	Representative Station	Stretch Length (ft)	Seepage without Cutoff Wall (ac-ft/yr)	Percent reduction based on cross section	Seepage with Cutoff Wall (ac-ft/yr)	Is Cutoff Wall Proposed at this Location?
1	00+00 to 48+00	27+00	4,800	19	0	19	N
2	48+00 to 100+00	70+00	5,200	14	85	2	Y
3	100+00 to 110+00	70+00	1,000	3	85	.4	Y
4a	110+00 to 120+00	70+00	1,000	3	0	3	N

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Table 5 (Cont.)

Reach	Stations	Representative Station	Stretch Length (ft)	Seepage without Cutoff Wall (ac-ft/yr)	Percent reduction based on cross section	Seepage with Cutoff Wall (ac-ft/yr)	Is Cutoff Wall Proposed at this Location?
4a	120+00 to 190+00	353+00	7,000	95	0	95	N
4b	190+00 to 228+00	217+00	3,800	490	0	490	N
5a	228+00 to 263+00	70+00	3,500	10	0	10	N
5b	263+00 to 280+00	27+00	1,700	6	0	6	N
6	280+00 to 330+00	217+00	5,000	650	85	100	Y
7a	330+00 to 345+00	353+00	1,500	20	85	3	Y
7b	345+00 to 362+00	353+00	1,700	23	85	3	Y
8	362+00 to 402+00	353+00	4,000	55	85	8	Y
9	402+00 to 430+00	353+00	2,800	38		38	N
9	430+00 to 468+10	353+00	3,800	50	85	8	Y
10	468+10 to 495+00	217+00	2,690	350	40	210	Y
11	495+00 to 635+00	217+00	14,000	1810	0	1810	N
12	635+00 to 640+00	217+00	500	65	0	65	N
12	640+00 to 667+00	70+00	2,700	7	0	7	N
13	667+00 to 700+00	353+00	3,300	45	40	30	Y
14	700+00 to 732+00	70+00	3,200	8	0	8	N
15	732+00 to 780+00	217+00	4,800	620	40	375	Y
16	780+00 to 832+00	217+00	5,200	675	0	675	N
17	832+00 to 842+00	217+00	1,000	130	40	80	Y
18	842+00 to 857+00	217+00	1,500	195	40	120	Y
19a	857+00 to 875+00	217+00	1,800	235	40	140	Y
19b	875+00 to 925+00	70+00	5,000	15	40	8	Y
20a	925+00 to 925+50	27+00	50	.2	0	.2	N
20b	925+50 to 960+00	27+00	3,550	13	0	13	N
Total Seepage				**5,650**		**4,330**	

The results presented in Table 5 indicate the construction of cutoff walls could potentially reduce the groundwater aquifer recharge landward of the levee by approximately 20-25%. Seepage through the levee foundation without the wall is estimated at 5,650 acre-feet per year. Seepage with the SB cutoff wall in place is approximately 4,330 acre-feet per year. The resulting impact to the groundwater recharge is approximately 1,300 acre-feet per year. In our opinion, these results are likely conservative and represent the upper-bound estimate. The actual impact is likely lower, due to 3-D effects that cannot be assessed with the existing modeling.

Step 10

A new 2 mile long canal will be constructed along the east levee between Stations 200+00 and 305+00. This canal, shown in plan in Attachment C, will be located approximately 500 to 1,000 feet landward of the levee toe and will follow the existing

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levee alignment. In general, the canal will be filled with water during summer months and will be dry during the winter months (See Plate 7).

We have evaluated the impact of the canal operation on the groundwater conditions in the area. Transient analyses were performed to estimate seepage quantities from and into the canal at various times throughout the year. The analyses were performed for Station 70+00 with a cutoff wall in place. The canal cross-section was incorporated into the transient analysis model described in Step 8 above as a 8 feet deep and 10 feet wide ditch with 3H:1V side slopes positioned 1,000 ft landward of the levee. The canal was assumed to be filled with up to 5 feet of water from May through November and was allowed to seep in the winter, modeled as a free seepage discharge face. The canal operation was modeled as another time-dependent boundary condition applied, as shown on Plate 22. The canal will be excavated through the surficial clay blanket which consists primarily of CL with some CH and ML soils with percent fines between 50 and 70 percent. The permeability of this layer is estimated at 10^{-5} cm/sec. This permeability was assigned to the surface layer to represent base-case conditions. The clay blanket thickness varies across the site and excavation of the canal may result in a complete removal of the surficial clay at some locations. To account for variability in subsurface conditions and the possibility of a complete removal of the clay blanket, we have conducted a sensitivity analysis with permeability of the surface layer increased by one order of magnitude (10^{-4} cm/sec). The results of this analysis provide an upper bound estimate of seepage losses from the canal.

Seepage quantities were calculated using a flux line placed along the perimeter of canal cross-section. Positive and negative quantities indicate flow from and into the ditch, respectively. The estimated seepage quantities as a function of time are shown on Plate 23. Based on the results of the transient analyses, seepage loss is estimated at 1.4 acre-t/year per 1,000 feet of the canal for base-case conditions. Only positive flow (flow from the canal) was considered in these computations. Seepage loss over the entire length of the canal is estimated at 15 acre-ft per year. The upper bound estimate is approximately 90 acre-ft per year.

We have also evaluated the combined impact of the cutoff wall construction and the canal operation on the groundwater table in the vicinity of the levee. This evaluation was performed based on the results of transient seepage analysis described in Steps 8 and 10. Seepage quantities as a function of time are shown graphically on Plate 24. Positive and negative quantities indicate flow from and into the river, respectively. Seepage quantities were calculated using a flux line placed immediately landside of the cutoff wall. In addition, groundwater table elevation was estimated as a function of time at the location halfway between the existing levee and the proposed canal. The results, provided on Plate 25, indicate minimal impact of the canal during winter months. However, during summer months groundwater table elevation in the immediate vicinity of the proposed wall locations could increase by as much as 3 feet. This increase is likely due to the combined effect of the cutoff wall preventing backflow into the river and the additional inflow from the canal.

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Conclusions

The key findings and conclusions presented in this memorandum are as follows:

- Under the existing conditions seepage from the Sacramento River through the levee foundation along Sacramento River East Levee between Stations 00+00 and 960+00 is estimated to be about 5,650 acre-ft/year.
- At the proposed wall locations seepage flow could be reduced locally by up 85 percent, depending on stratigraphy and proposed wall depth.
- The overall impact of the proposed cutoff walls is estimated at approximately 1,300 acre-ft/year (20 percent reduction of the total recharge rate)
- The cutoff wall could impede seepage flow towards the river in the summer months when the river level is low.
- Construction of an irrigation canal may increase aquifer recharge by approximately 15 to 90 acre-ft per year.
- Construction of the cutoff wall and the canal may locally increase the groundwater levels up to 3 feet in the summer months.

Due to the limitations of the model, the analyses can only provide an order-of-magnitude estimate of the seepage quantities. Additional analyses with a three-dimensional model such as MODFLOW are recommended to properly characterize groundwater flow regime in the area account for 3-Dimensional effects and quantify the impact of the proposed SB cutoff wall on the aquifer recharge.

If you have questions regarding this design or require additional information, please contact either Elena Sossenkina at (303) 237-6601 or the undersigned.

Sincerely,

KLEINFELDER WEST, INC.



Keith A. Ferguson, PE
Principal Engineer

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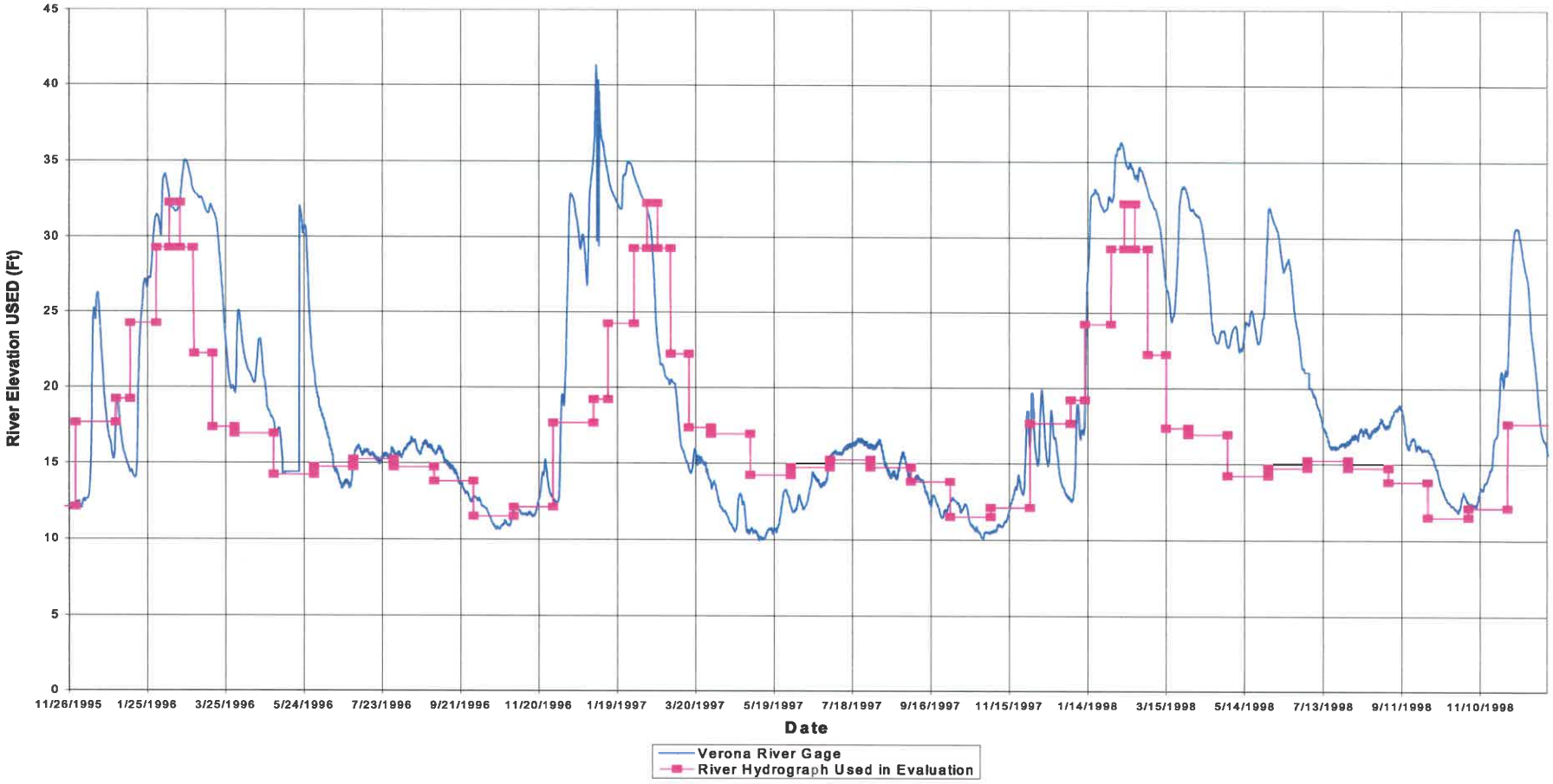
PLATES

11/26/1995 - 12/31/1998



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Evaluation of Cutoff Wall Impact on Groundwater Recharge
Sacramento River East Levee

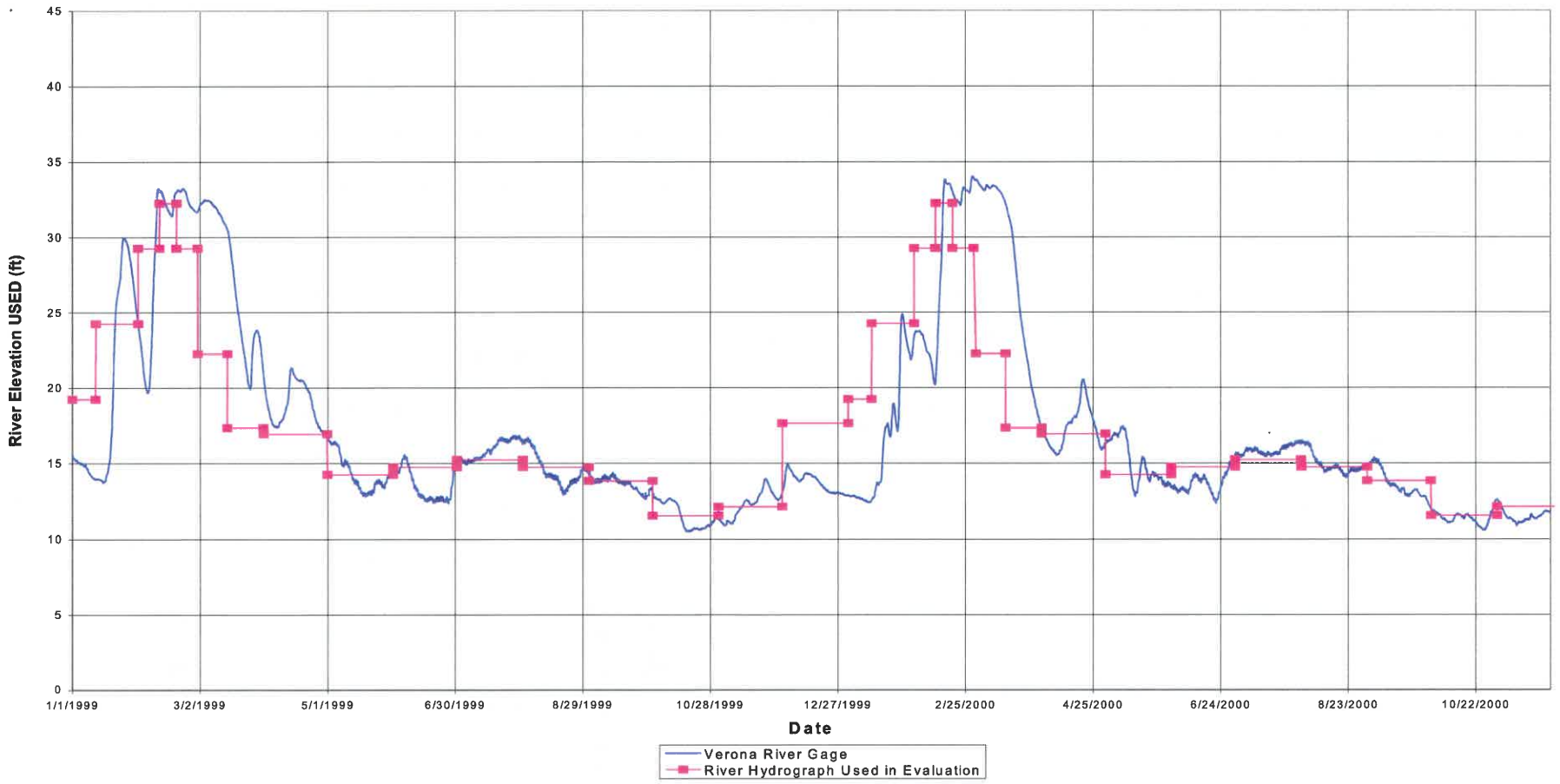
PLATE 1

Graphics by: ESS
Project No. 72834

Date: 04/21/09
File: 1995-2000 Hydrograph Data 03-23-09.xls

Ref: http://cdec.water.ca.gov/queryStation.html

01/01/1999 - 11/26/2000



Ref: http://cdec.water.ca.gov/queryStation.html

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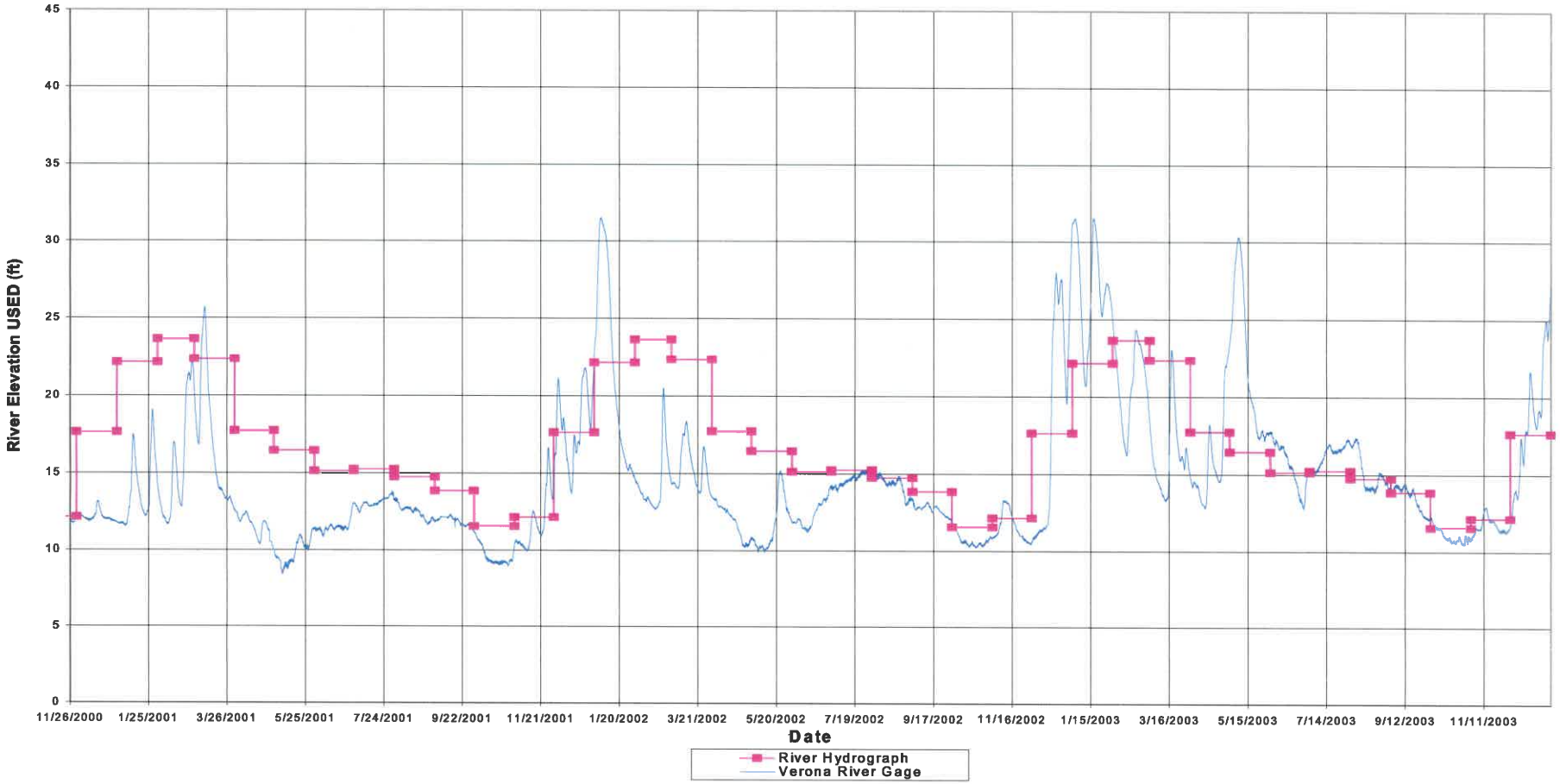
Graphics by: ESS
Project No. 72834

Date: 04/21/09
File: 1995-2000 Hydrograph Data 03-23-09.xls

Evaluation of Cutoff Wall Impact on Groundwater Recharge
Sacramento River East Levee

PLATE 2

11/26/2000 - 12/31/2003



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Evaluation of Cutoff Wall Impact on Groundwater Recharge
Sacramento River East Levee

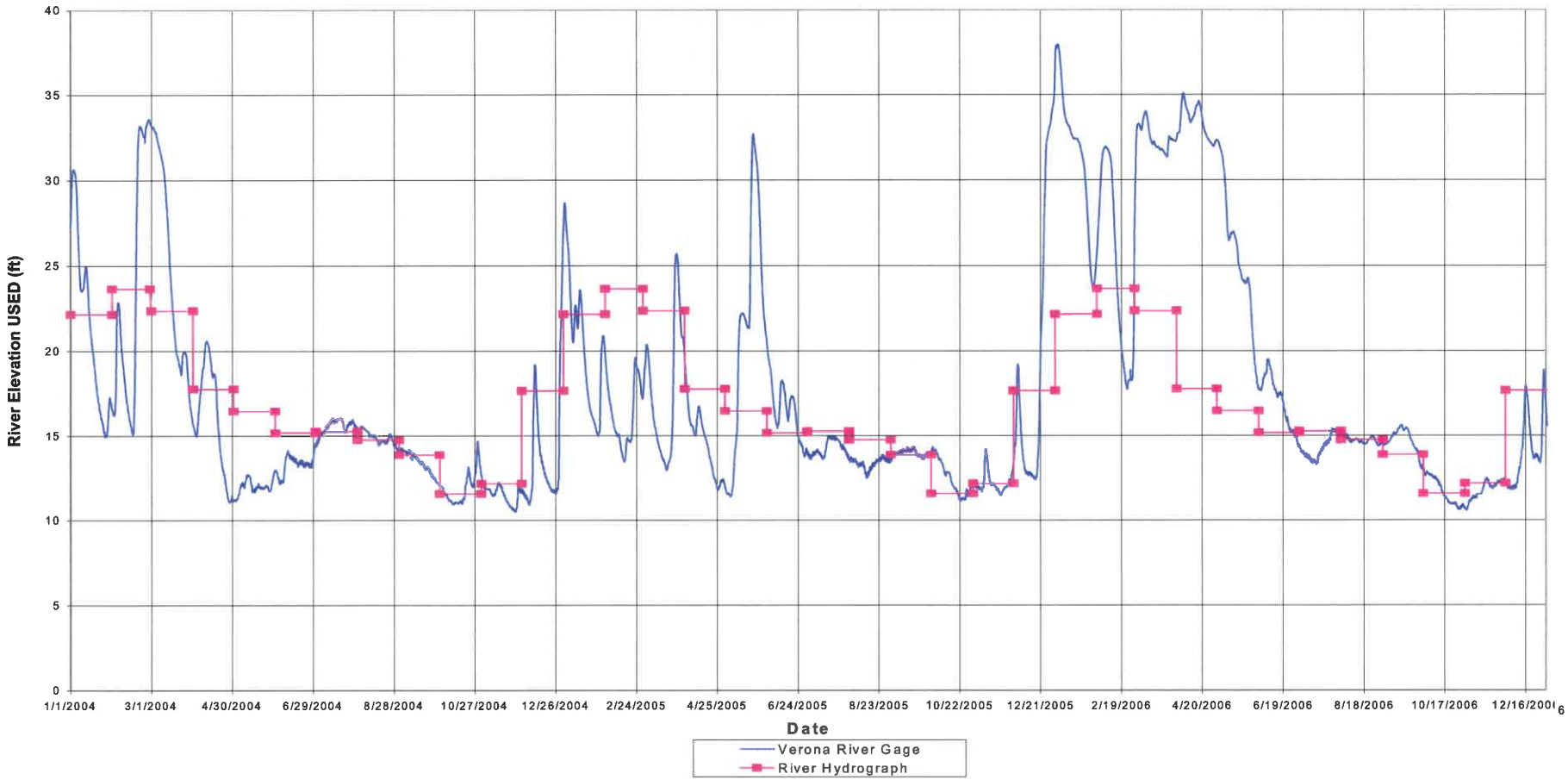
PLATE 3

Graphics by: ESS
Project No. 72834

Date: 04/21/09
File: 00-07 Hydrograph Data 03-2309.xls

Ref: http://cdec.water.ca.gov/queryStation.html

01/01/2004 - 12/31/2006



Ref: http://cdec.water.ca.gov/queryStation.html

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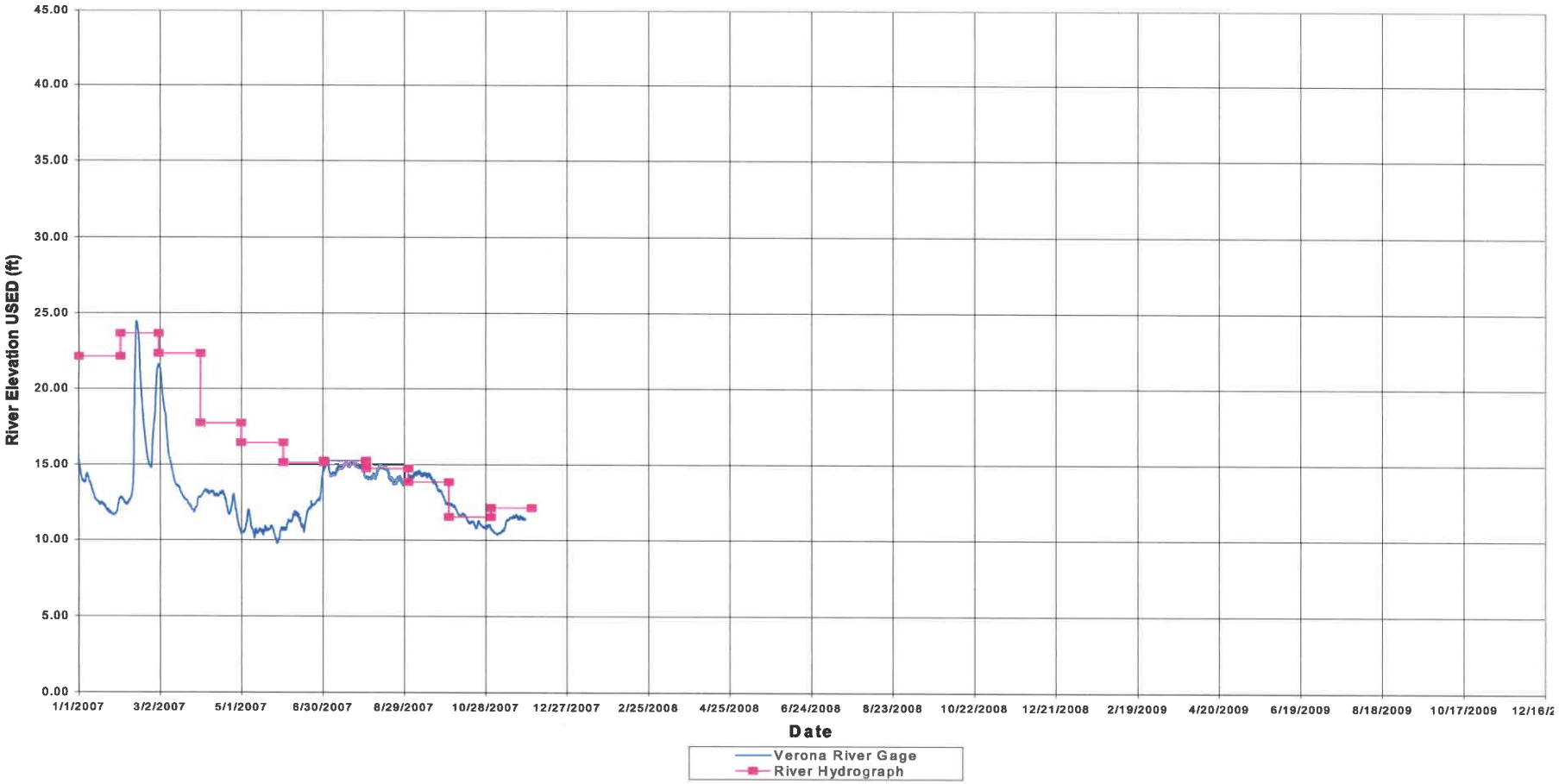
Graphics by: ESS
Project No. 72834

Date: 04/21/09
File:00-07 Hydrograph
Data 03-2309.xls

Evaluation of Cutoff Wall Impact
on Groundwater Recharge
Sacramento River East Levee

PLATE
4

01/01/2007 - 11/26/2007



Ref: http://cdec.water.ca.gov/queryStation.html

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Graphics by: ESS
Project No. 72834

Date: 04/21/09
File: 00-07 Hydrograph
Data 03-2309.xls

Evaluation of Cutoff Wall Impact
on Groundwater Recharge
Sacramento River East Levee

PLATE
5

Sacramento River Elevation in Ft

Elevation	% of days per year river at given El.	Days per year river at El.	Elevation	% of days per year river at given El.	Days per year river at El.
8	0.0	0	25	1.2	4
9	0.5	2	26	0.8	3
10	1.2	4	27	1.0	4
11	8.2	30	28	0.8	3
12	12.4	45	29	0.7	3
13	12.3	45	30	0.8	3
14	12.5	45	31	1.2	4
15	11	40	32	2.6	10
16	7.8	29	33	2.9	10
17	5.4	20	34	1.4	5
18	3.5	13	35	0.8	3
19	2.3	8	36	0.2	1
20	1.8	7	37	0.1	0.4
21	1.9	7	38	0.1	0.4
22	1.5	6	39	0.0	0
23	1.4	5	40	0.0	0
24	1.7	6	41	0.0	0

Notes:

1. Historical river elevations in Plates 1-5 are reported in the USED datum. Elevations reported above are using NAVD88 datum. Satistics are based on data from the Verona River Gage obtained from http://cdec.water.ca.gov/queryStation.html from the period 11/26/1995-11/26/2007.
2. Elevations in the seepage models were adjusted to a nearest mesh node. Model Elevations are lower than elevations in NAVD88 by 0.03 feet.

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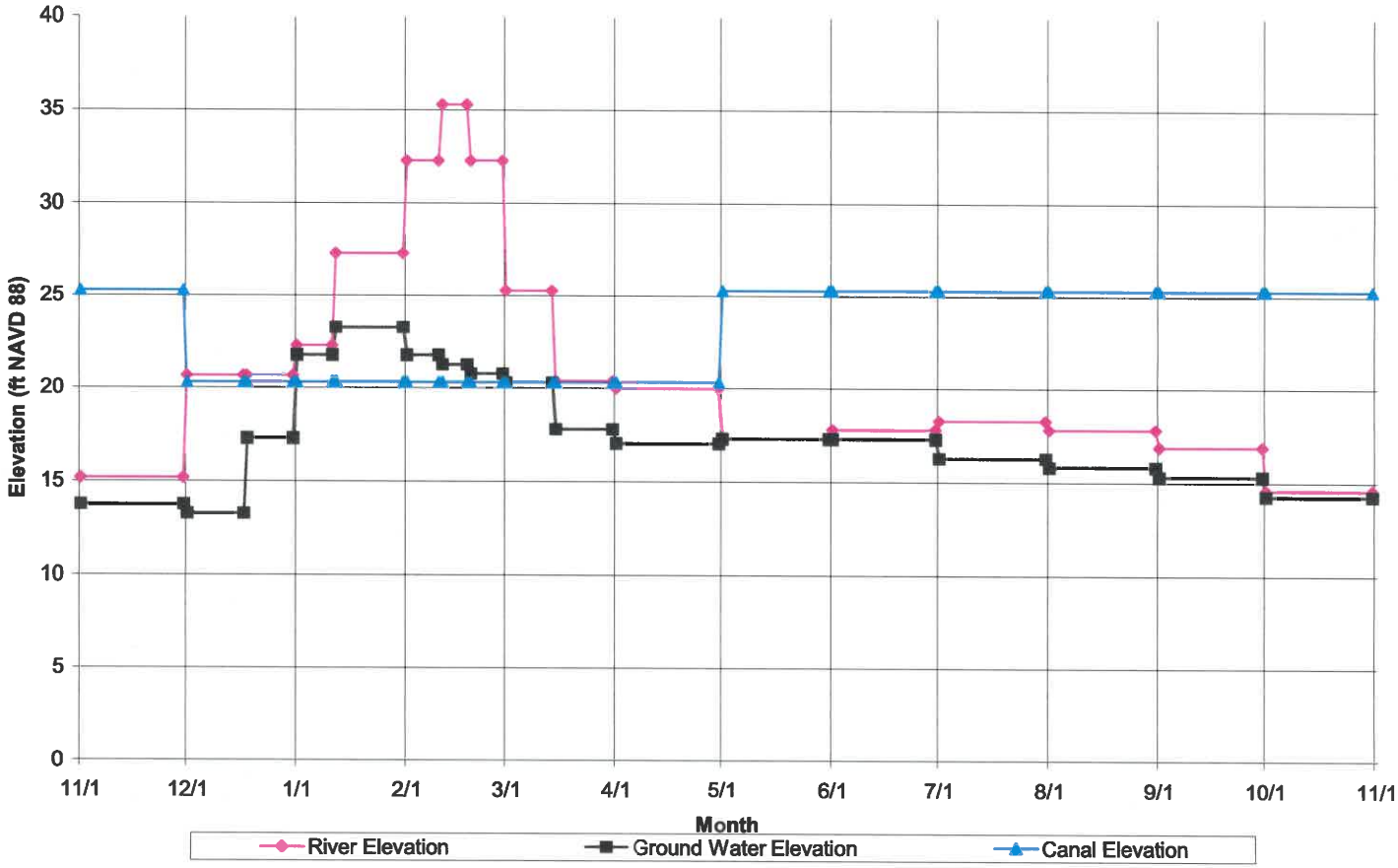
Graphics by: ESS
Project No. 72834

Date: 04/21/09
File: SacRiverCutoffWall Eval_04-07-09.ppt

Evaluation of Cutoff Wall Impact on Groundwater Recharge
Sacramento River East Levee

PLATE 6

Groundwater, River, and Canal Hydrographs



Note: Elevations in the seepage models were adjusted to a nearest mesh node. Model Elevations are lower than elevations in NAVD88 by 0.03 feet.

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Graphics by: ESS
Project No. 72834

Date: 04/21/09
File: TransientTimeStep Elevs 03-20-09

Evaluation of Cutoff Wall Impact on Groundwater Recharge
Sacramento River East Levee

PLATE 7

Transient Time Step Table

Time Step	Date	River Elevation	Ground Water Elevation	Canal Elevation
1	2/11	35.25	21.25	20.25
2	2/18	35.25	21.25	20.25
3	2/19	32.25	20.75	20.25
4	2/28	32.25	20.75	20.25
5	3/1	25.25	20.25	20.25
6	3/14	25.25	20.25	20.25
7	3/15	20.35	17.75	20.25
8	3/31	20.35	17.75	20.25
9	4/1	19.95	17.00	20.25
10	4/30	19.95	17.00	20.25
11	5/1	17.25	17.25	25.25
12	5/31	17.25	17.25	25.25
13	6/1	17.75	17.25	25.25
14	6/30	17.75	17.25	25.25
15	7/1	18.25	16.25	25.25
16	7/31	18.25	16.25	25.25
17	8/1	17.75	15.75	25.25
18	8/31	17.75	15.75	25.25
19	9/1	16.85	15.25	25.25
20	9/30	16.85	15.25	25.25
21	10/1	14.55	14.25	25.25
22	10/31	14.55	14.25	25.25
23	11/1	15.15	13.75	25.25
24	11/30	15.15	13.75	25.25
25	12/1	20.65	13.25	20.25
26	12/17	20.65	13.25	20.25
27	12/18	20.65	17.25	20.25
28	12/31	20.65	17.25	20.25
29	1/1	22.25	21.75	20.25
30	1/11	22.25	21.75	20.25
31	1/12	27.25	23.25	20.25
32	1/31	27.25	23.25	20.25
33	2/1	32.25	21.75	20.25
34	2/10	32.25	21.75	20.25

Note: Elevations in the seepage models were adjusted to a nearest mesh node. Model Elevations are lower than elevations in NAVD88 by 0.03 feet.

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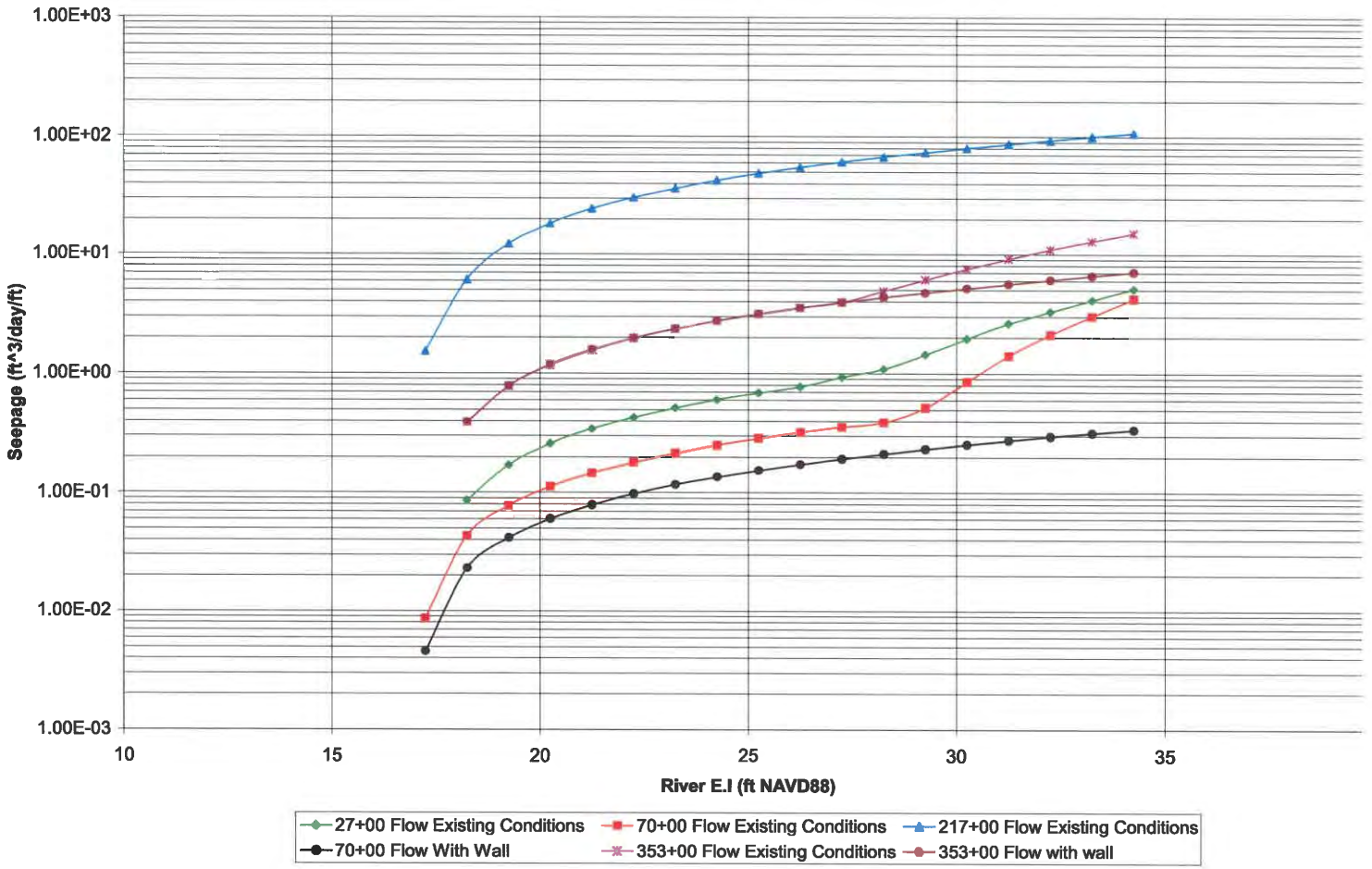
Graphics by: ESS
Project No. 72834

Date: 04/21/09
File: TransientTimeStep Elevs 03-23-09.xls

Evaluation of Cutoff Wall Impact on Groundwater Recharge
Sacramento River East Levee

PLATE 8

Estimated Seepage vs River El.



Note: Elevations in the seepage models were adjusted to a nearest mesh node. Model Elevations are lower than elevations in NAVD88 by 0.03 feet.

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Graphics by: ESS
Project No. 72834

Date: 04/21/09
File: 00-07 Hydrograph Data 03-23-09.xls

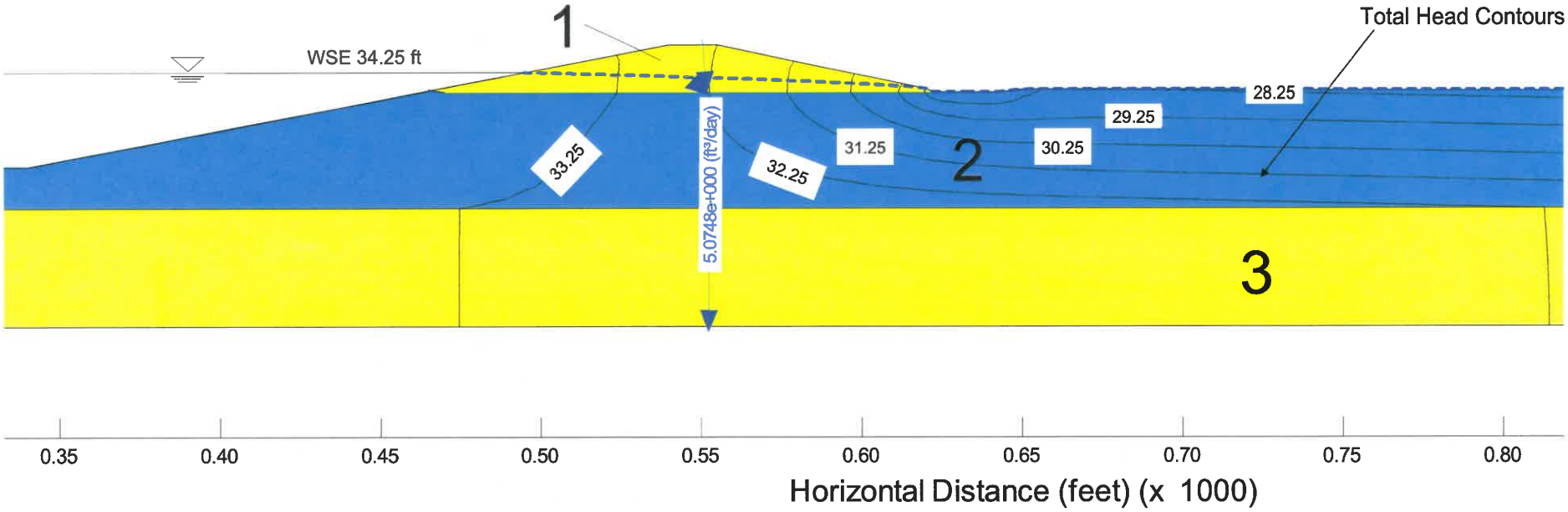
Evaluation of Cutoff Wall Impact on Groundwater Recharge
Sacramento River East Levee

PLATE 9

STA 27+00, steady-state analysis, existing conditions
Total Flow: 3.9 acre ft/yr/1000 ft

Hydraulic Conductivity (Kh) and Anisotropy Ratio (Kv:Kh)

Material #1 Hyd K Fn: 7 Sand w/ 0-2% CL or 3-7% ML, Ks=14 ft/day (5x10E-3 cm/s) Ky/Kx Ratio: 0.25
Material #2 Hyd K Fn: 5 Clay Ks=0.028 ft/day (1x10E-5 cm/s) Ky/Kx Ratio: 0.25
Material #3 Hyd K Fn: 7 Sand w/ 0-2% CL or 3-7% ML, Ks=14 ft/day (5x10E-3 cm/s) Ky/Kx Ratio: 0.25



Note: Elevations in the seepage models were adjusted to a nearest mesh node. Model Elevations are lower than elevations in NAVD88 by 0.03 feet.

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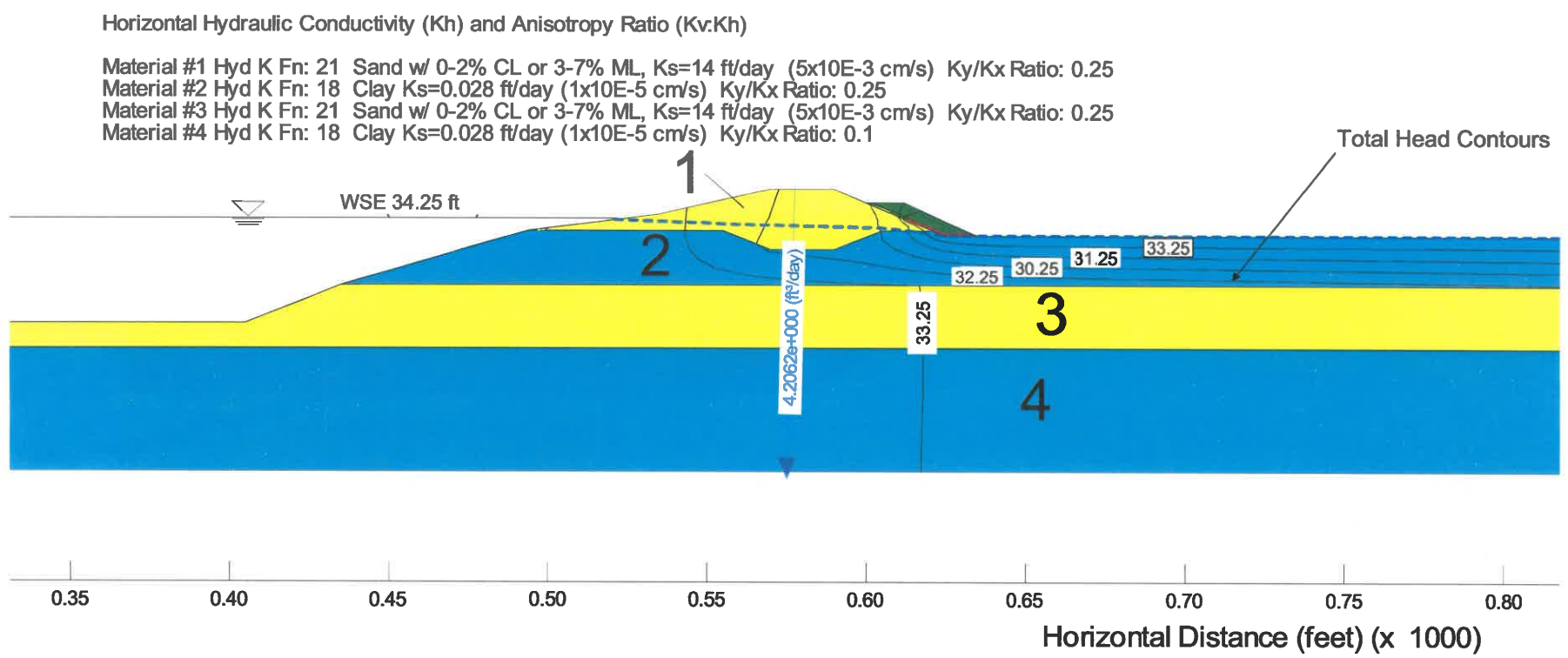
Graphics by: ESS
Project No. 72834

Date: 04/21/09
File: 27+00_Plate10

Evaluation of Cutoff Wall Impact on Groundwater Recharge
Sacramento River East Levee

PLATE 10

STA 70+00, steady-state analysis, existing conditions
Total Flow: 2.6 acre ft/yr/1000 ft



Note: Elevations in the seepage models were adjusted to a nearest mesh node. Model Elevations are lower than elevations in NAVD88 by 0.03 feet.

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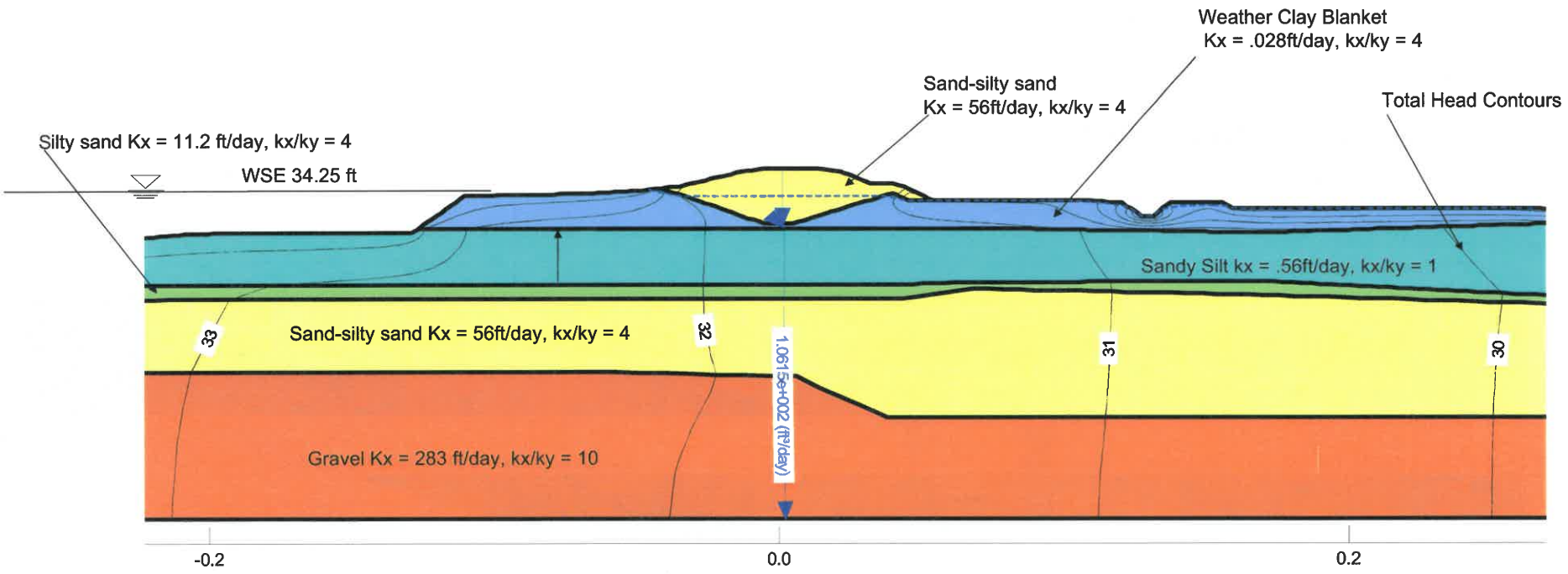
Graphics by: ESS
Project No. 72834

Date: 04/21/09
File: 70+00_Plate11

Evaluation of Cutoff Wall Impact on Groundwater Recharge
Sacramento River East Levee

PLATE 11

STA 217+00, steady-state analysis, existing conditions
Total Flow: 129 acre ft/yr/1000 ft
Ref: URS model 217+00 from Sac Levees report 2007



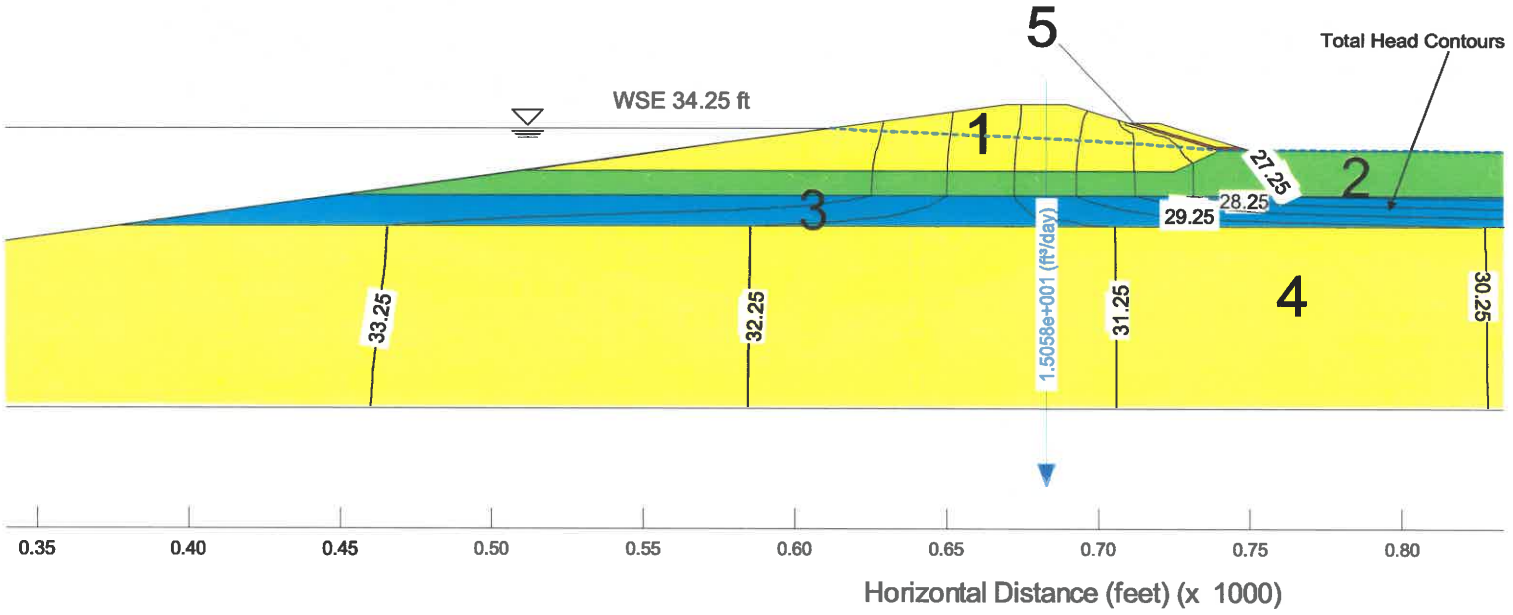
Note: Elevations in the seepage models were adjusted to a nearest mesh node. Model Elevations are lower than elevations in NAVD88 by 0.03 feet.

KLEINFELDER Bright People. Right Solutions.		Evaluation of Cutoff Wall Impact on Groundwater Recharge Sacramento River East Levee	PLATE 12
Graphics by: ESS Project No. 72834	Date: 04/21/09 File: 217+00_Plate12		

STA 353+00, steady-state analysis, existing conditions
Total Flow: 13.4 acre ft/yr/1000 ft

Horizontal Hydraulic Conductivity (Kh) and Anisotropy Ratio (Kv:Kh)

Material #1 Hyd K Fn: 9 Sand w/ 0-2% CL or 3-7% ML, Ks=14 ft/day (5x10E-3 cm/s) Ky/Kx Ratio: 0.25
Material #2 Hyd K Fn: 7 Silt Ks=0.56 ft/day (2x10E-4 cm/s) Ky/Kx Ratio: 1
Material #3 Hyd K Fn: 5 Clay Ks=0.028 ft/day (1x10E-5 cm/s) Ky/Kx Ratio: 0.1
Material #4 Hyd K Fn: 9 Sand w/ 0-2% CL or 3-7% ML, Ks=14 ft/day (5x10E-3 cm/s) Ky/Kx Ratio: 0.25
Material #5 Hyd K Fn: 8 Drainage Rock Ks=2800 ft/day (10 cm/s) Ky/Kx Ratio: 1



Note: Elevations in the seepage models were adjusted to a nearest mesh node. Model Elevations are lower than elevations in NAVD88 by 0.03 feet.

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Graphics by: ESS
Project No. 72834

Date: 04/21/09
File: 353+00_Plate13

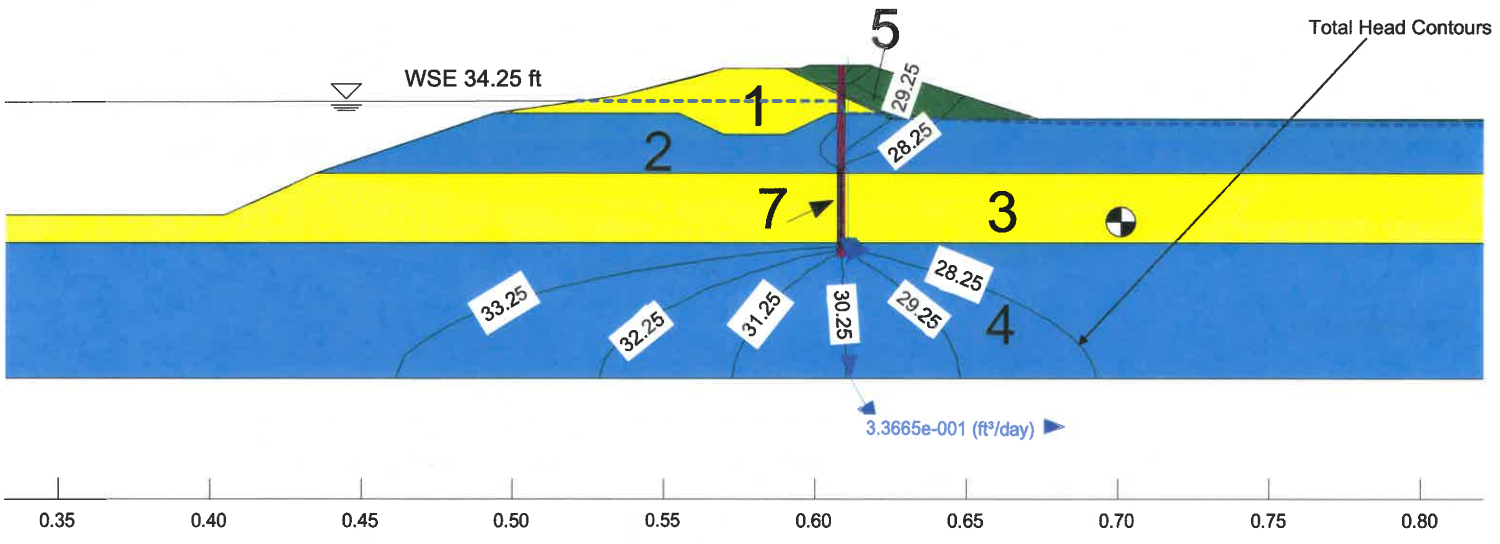
Evaluation of Cutoff Wall Impact on Groundwater Recharge
Sacramento River East Levee

PLATE 13

STA 70+00, steady-state analysis, adjacent levee, with wall
Total Flow: 0.4 acre ft/yr/1000 ft

Horizontal Hydraulic Conductivity (Kh) and Anisotropy Ratio (Kv:Kh)

Material #1 Hyd K Fn: 10 Sand w/ 0-2% CL or 3-7% ML, Ks=14 ft/day (5x10E-3 cm/s) Ky/Kx Ratio: 0.25
Material #2 Hyd K Fn: 7 Clay Ks=0.028 ft/day (1x10E-5 cm/s) Ky/Kx Ratio: 0.25
Material #3 Hyd K Fn: 10 Sand w/ 0-2% CL or 3-7% ML, Ks=14 ft/day (5x10E-3 cm/s) Ky/Kx Ratio: 0.25
Material #4 Hyd K Fn: 7 Clay Ks=0.028 ft/day (1x10E-5 cm/s) Ky/Kx Ratio: 0.1
Material #5 Hyd K Fn: 8 Silt Ks= 0.028 ft/day (1x10E-5 cm/s) Ky/Kx Ratio: 0.25
Material #7 Hyd K Fn: 11 Cutoff wall Ks = 0.0028ft/day (1.0x10-6 cm/sec) Ky/Kx Ratio: 1



Note: Elevations in the seepage models were adjusted to a nearest mesh node. Model Elevations are lower than elevations in NAVD88 by 0.03 feet.

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Graphics by: ESS
Project No. 72834

Date: 04/21/09
File: 70+00_Plate14

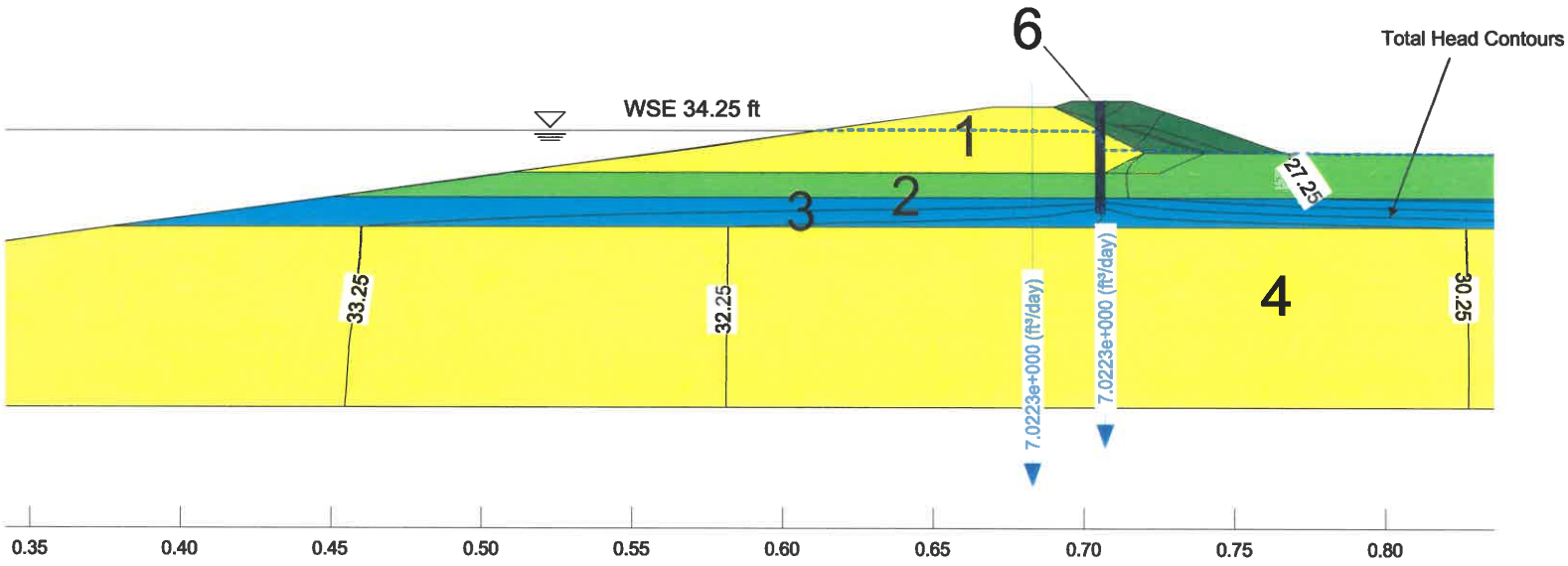
Evaluation of Cutoff Wall Impact on Groundwater Recharge
Sacramento River East Levee

PLATE 14

STA 353+00, steady-state analysis, adjacent levee, with wall
Total Flow: 8.4 acre ft/yr/1000 ft

Horizontal Hydraulic Conductivity (Kh) and Anisotropy Ratio (Kv:Kh)

Material #1 Hyd K Fn: 9 Sand w/ 0-2% CL or 3-7% ML, Ks=14 ft/day (5x10E-3 cm/s) Ky/Kx Ratio: 0.25
Material #2 Hyd K Fn: 7 Silt Ks=0.56 ft/day (2x10E-4 cm/s) Ky/Kx Ratio: 1
Material #3 Hyd K Fn: 5 Clay Ks=0.028 ft/day (1x10E-5 cm/s) Ky/Kx Ratio: 0.1
Material #4 Hyd K Fn: 9 Sand w/ 0-2% CL or 3-7% ML, Ks=14 ft/day (5x10E-3 cm/s) Ky/Kx Ratio: 0.25
Material #6 Hyd K Fn: 10 Cutoff wall Ks = 0.0028 ft/day (1.0x10-6 cm/sec) Ky/Kx Ratio: 1



Note: Elevations in the seepage models were adjusted to a nearest mesh node. Model Elevations are lower than elevations in NAVD88 by 0.03 feet.

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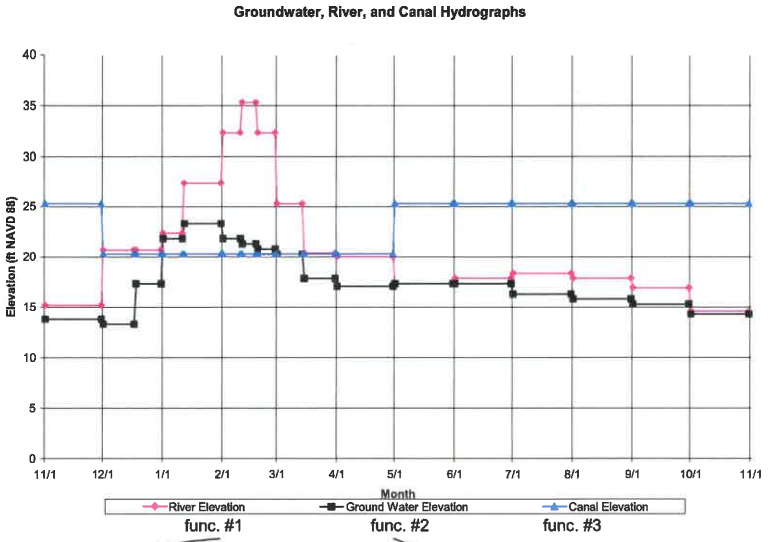
Graphics by: ESS
Project No. 72834

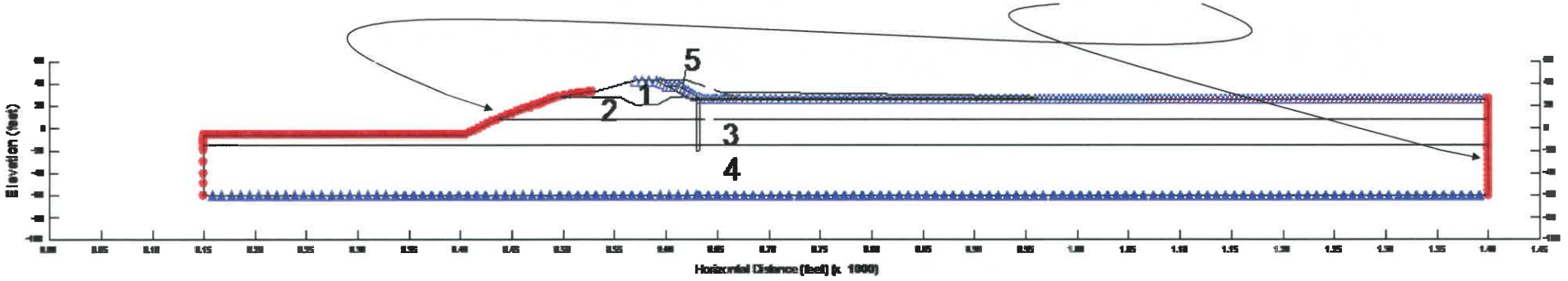
Date: 04/21/09
File: 353+00_Plate15

Evaluation of Cutoff Wall Impact on Groundwater Recharge
Sacramento River East Levee

PLATE 15

STA 70+00, boundary conditions
Transient analysis, existing conditions





Note: Elevations in the seepage models were adjusted to a nearest mesh node. Model Elevations are lower than elevations in NAVD88 by 0.03 feet.

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Graphics by: ESS
Project No. 72834

Date: 04/21/09
File: 70+00_Plate16_BC

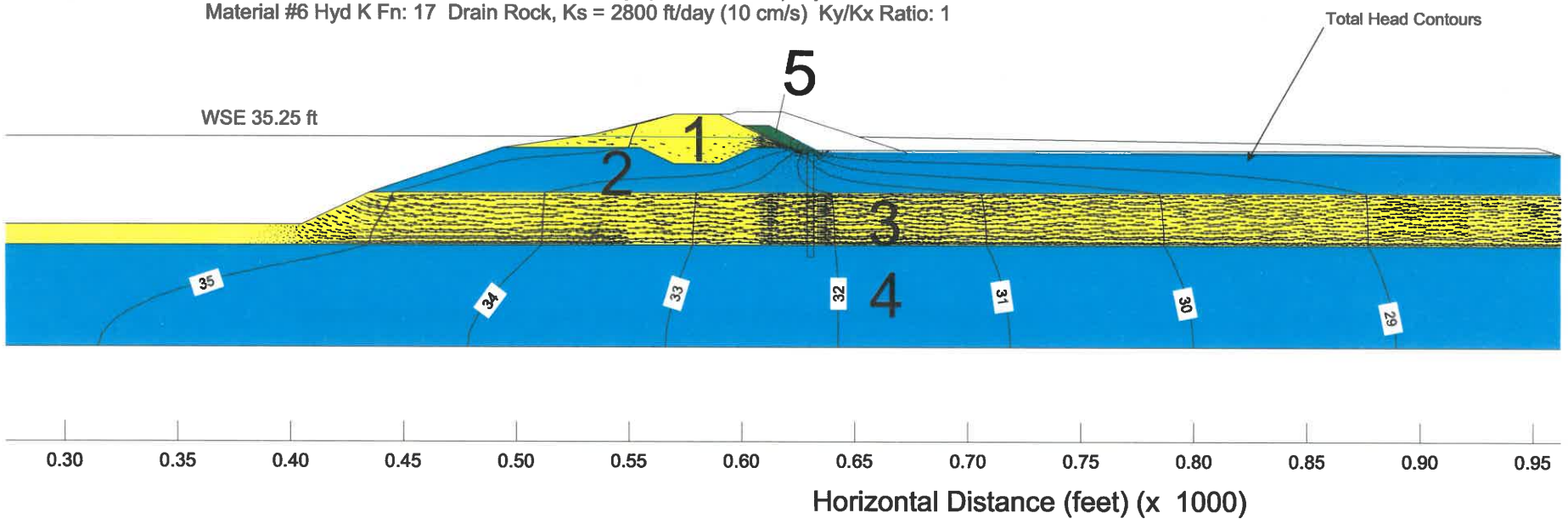
Evaluation of Cutoff Wall Impact on Groundwater Recharge
Sacramento River East Levee

PLATE 16

STA 70+00, transient analysis, existing conditions
Time Step: 2 (Winter)

Horizontal Hydraulic Conductivity (Kh) and Anisotropy Ratio (Kv:Kh)

Material #1 Hyd K Fn: 21 Sand w/ 0-2% CL or 3-7% ML, Ks=14 ft/day (5x10E-3 cm/s) Ky/Kx Ratio: 0.25
Material #2 Hyd K Fn: 18 Clay Ks=0.028 ft/day (1x10E-5 cm/s) Ky/Kx Ratio: 0.25
Material #3 Hyd K Fn: 21 Sand w/ 0-2% CL or 3-7% ML, Ks=14 ft/day (5x10E-3 cm/s) Ky/Kx Ratio: 0.25
Material #4 Hyd K Fn: 18 Clay Ks=0.028 ft/day (1x10E-5 cm/s) Ky/Kx Ratio: 0.1
Material #5 Hyd K Fn: 19 Silt Ks= 0.028 ft/day (1x10E-5 cm/s) Ky/Kx Ratio: 0.25
Material #6 Hyd K Fn: 17 Drain Rock, Ks = 2800 ft/day (10 cm/s) Ky/Kx Ratio: 1



Note: Elevations in the seepage models were adjusted to a nearest mesh node. Model Elevations are lower than elevations in NAVD88 by 0.03 feet.

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Graphics by: ESS
Project No. 72834

Date: 04/21/09
File: Tyler's adjusted run_ NAVD88

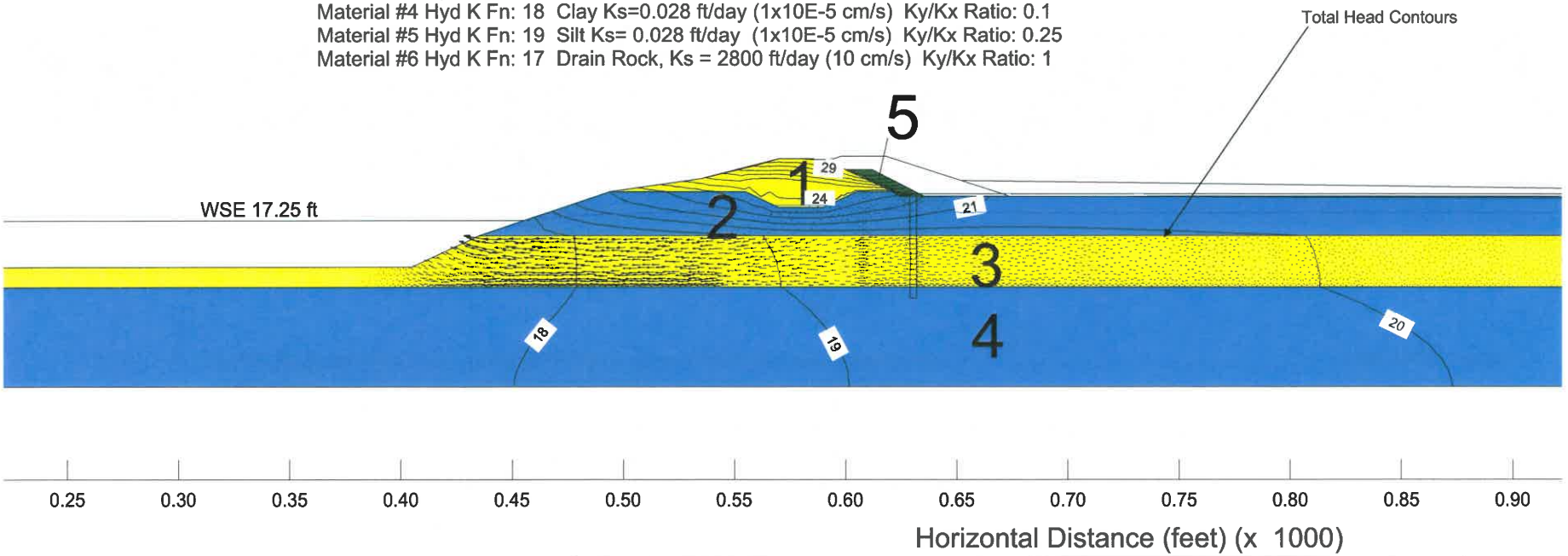
Evaluation of Cutoff Wall Impact on Groundwater Recharge
Sacramento River East Levee

PLATE 17

STA 70+00, transient analysis, existing conditions
Time Step: 11 (Summer)

Horizontal Hydraulic Conductivity (Kh) and Anisotropy Ratio (Kv:Kh)

Material #1 Hyd K Fn: 21 Sand w/ 0-2% CL or 3-7% ML, Ks=14 ft/day (5x10E-3 cm/s) Ky/Kx Ratio: 0.25
Material #2 Hyd K Fn: 18 Clay Ks=0.028 ft/day (1x10E-5 cm/s) Ky/Kx Ratio: 0.25
Material #3 Hyd K Fn: 21 Sand w/ 0-2% CL or 3-7% ML, Ks=14 ft/day (5x10E-3 cm/s) Ky/Kx Ratio: 0.25
Material #4 Hyd K Fn: 18 Clay Ks=0.028 ft/day (1x10E-5 cm/s) Ky/Kx Ratio: 0.1
Material #5 Hyd K Fn: 19 Silt Ks= 0.028 ft/day (1x10E-5 cm/s) Ky/Kx Ratio: 0.25
Material #6 Hyd K Fn: 17 Drain Rock, Ks = 2800 ft/day (10 cm/s) Ky/Kx Ratio: 1



Note: Elevations in the seepage models were adjusted to a nearest mesh node. Model Elevations are lower than elevations in NAVD88 by 0.03 feet.

KLEINFELDER
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Graphics by: ESS
Project No. 72834

Date: 04/21/09
File: Tyler's adjusted run_ NAVD88

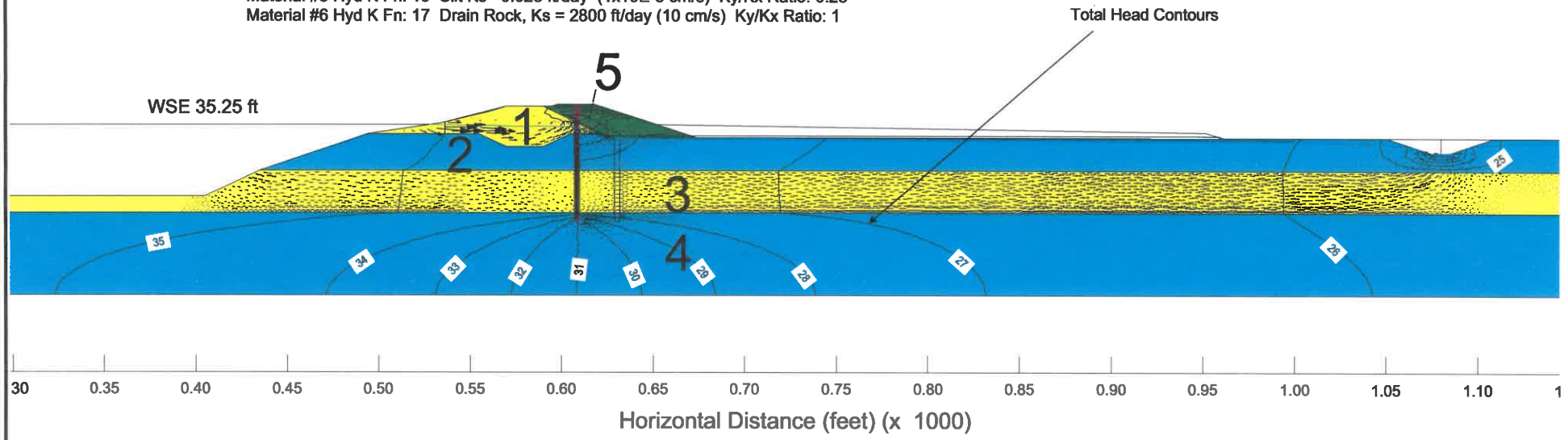
Evaluation of Cutoff Wall Impact on Groundwater Recharge
Sacramento River East Levee

PLATE 18

STA 70+00, transient analysis with cutoff wall
Time Step: 2 (Winter)

Horizontal Hydraulic Conductivity (Kh) and Anisotropy Ratio (Kv:Kh)

Material #1 Hyd K Fn: 21 Sand w/ 0-2% CL or 3-7% ML, Ks=14 ft/day (5x10E-3 cm/s) Ky/Kx Ratio: 0.25
Material #2 Hyd K Fn: 18 Clay Ks=0.028 ft/day (1x10E-5 cm/s) Ky/Kx Ratio: 0.25
Material #3 Hyd K Fn: 21 Sand w/ 0-2% CL or 3-7% ML, Ks=14 ft/day (5x10E-3 cm/s) Ky/Kx Ratio: 0.25
Material #4 Hyd K Fn: 18 Clay Ks=0.028 ft/day (1x10E-5 cm/s) Ky/Kx Ratio: 0.1
Material #5 Hyd K Fn: 19 Silt Ks= 0.028 ft/day (1x10E-5 cm/s) Ky/Kx Ratio: 0.25
Material #6 Hyd K Fn: 17 Drain Rock, Ks = 2800 ft/day (10 cm/s) Ky/Kx Ratio: 1



Note: Elevations in the seepage models were adjusted to a nearest mesh node. Model Elevations are lower than elevations in NAVD88 by 0.03 feet.

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Graphics by: ESS
Project No. 72834

Date: 04/21/09
File: Tyler's Original NAVD88 Transient with canal

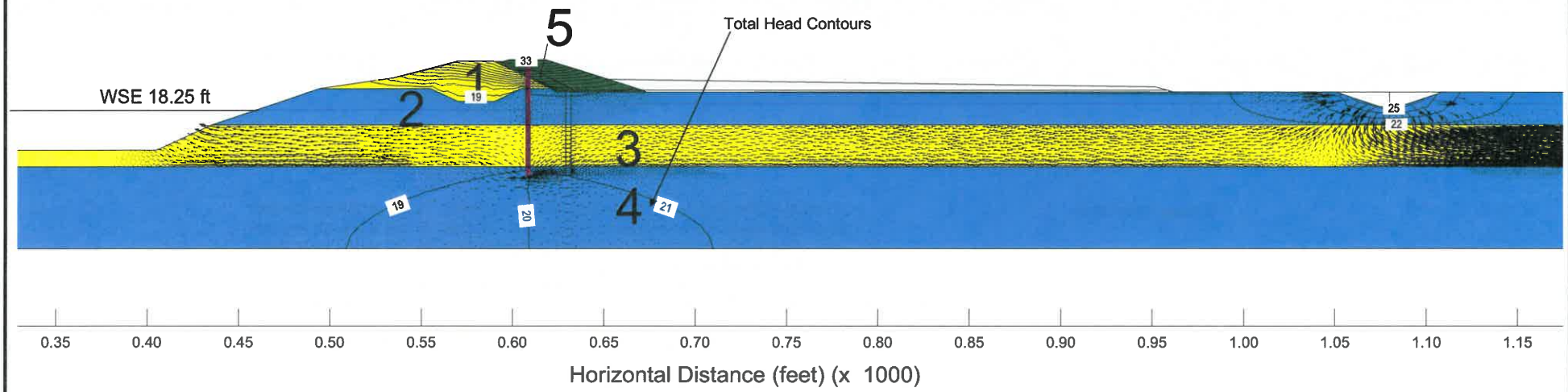
Evaluation of Cutoff Wall Impact on Groundwater Recharge
Sacramento River East Levee

PLATE 19

STA 70+00, transient analysis with cutoff wall
Time Step: 16 (Summer)

Horizontal Hydraulic Conductivity (Kh) and Anisotropy Ratio (Kv:Kh)

Material #1 Hyd K Fn: 21 Sand w/ 0-2% CL or 3-7% ML, Ks=14 ft/day (5x10E-3 cm/s) Ky/Kx Ratio: 0.25
Material #2 Hyd K Fn: 18 Clay Ks=0.028 ft/day (1x10E-5 cm/s) Ky/Kx Ratio: 0.25
Material #3 Hyd K Fn: 21 Sand w/ 0-2% CL or 3-7% ML, Ks=14 ft/day (5x10E-3 cm/s) Ky/Kx Ratio: 0.25
Material #4 Hyd K Fn: 18 Clay Ks=0.028 ft/day (1x10E-5 cm/s) Ky/Kx Ratio: 0.1
Material #5 Hyd K Fn: 19 Silt Ks= 0.028 ft/day (1x10E-5 cm/s) Ky/Kx Ratio: 0.25
Material #6 Hyd K Fn: 17 Drain Rock, Ks = 2800 ft/day (10 cm/s) Ky/Kx Ratio: 1



Note: Elevations in the seepage models were adjusted to a nearest mesh node. Model Elevations are lower than elevations in NAVD88 by 0.03 feet.

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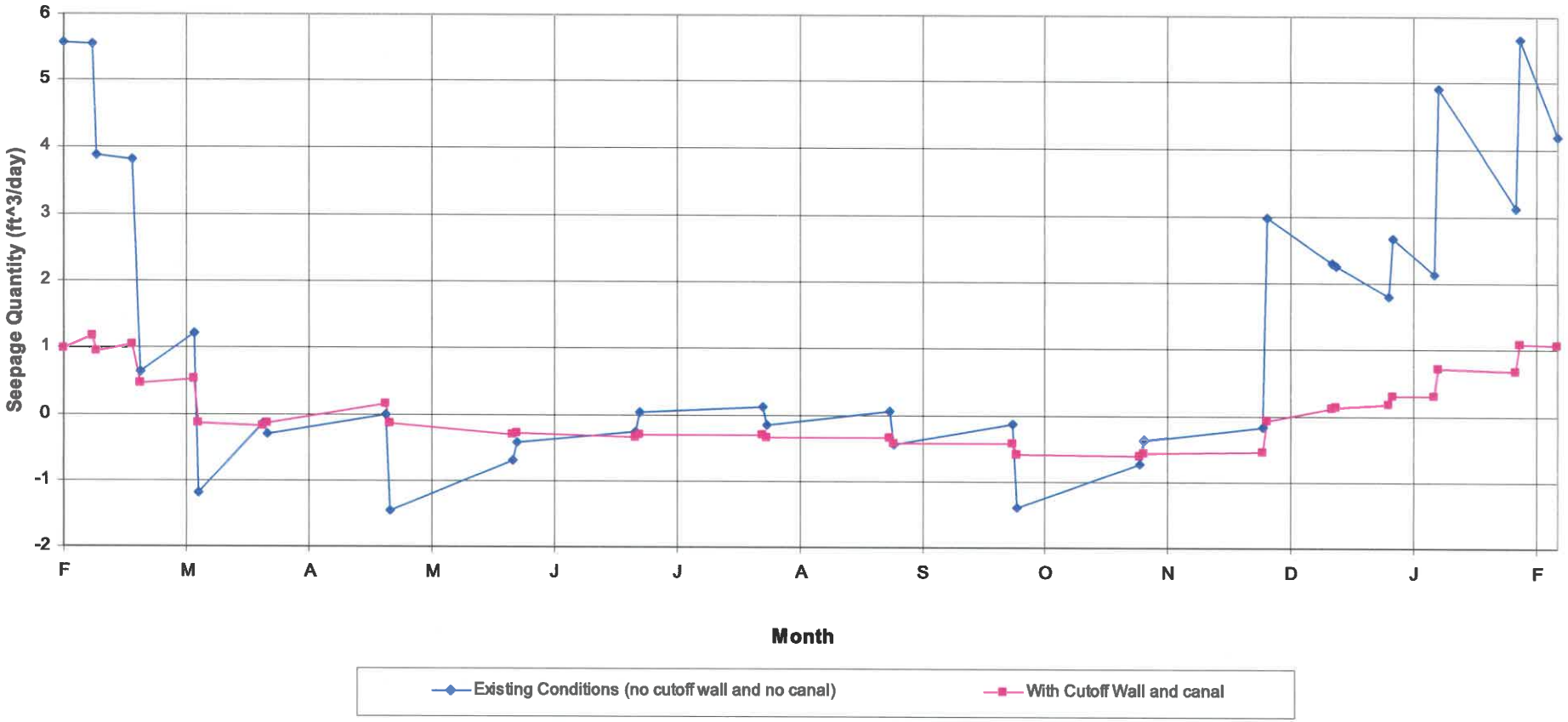
Graphics by: ESS
Project No. 72834

Date: 04/21/09
File: Tyler's Original NAVD88 Transient with canal

Evaluation of Cutoff Wall Impact on Groundwater Recharge Sacramento River East Levee

PLATE 20

Cutoff Wall Impact on Seepage Quantities



Notes:

1. Seepage quantities were calculated using a flux line placed approximately 40 feet from the landside of the cutoff wall. Positive and negative quantities indicate flow from and into the river, respectively.
2. Elevations in the seepage models were adjusted to a nearest mesh node. Model Elevations are lower than elevations in NAVD88 by 0.03 feet.

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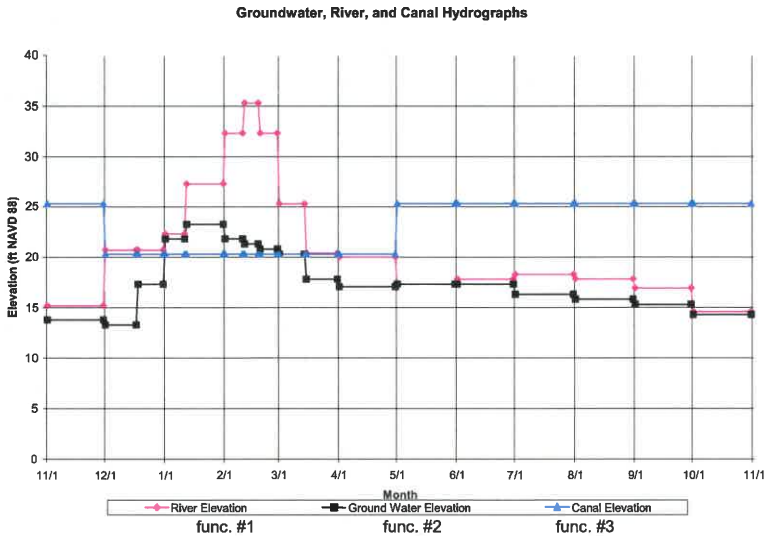
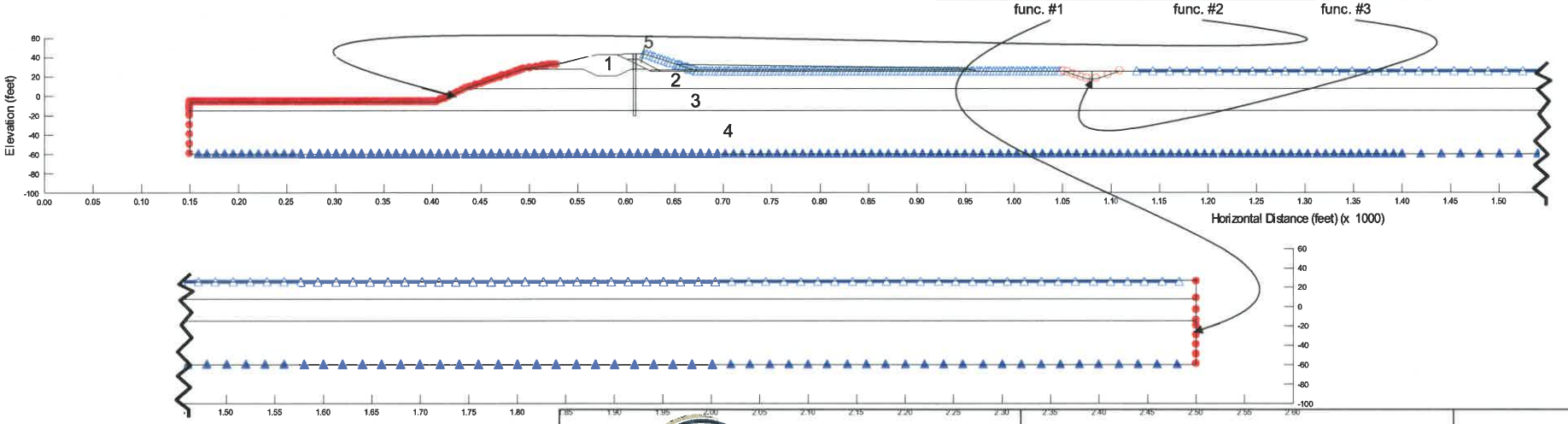
Date: 04/21/09
File: plate 21

Evaluation of Cutoff Wall Impact on Groundwater Recharge
Sacramento River East Levee

PLATE 21

STA 70+00, boundary conditions, Transient analysis with cutoff wall and canal





Note: Elevations in the seepage models were adjusted to a nearest mesh node. Model Elevations are lower than elevations in NAVD88 by 0.03 feet.

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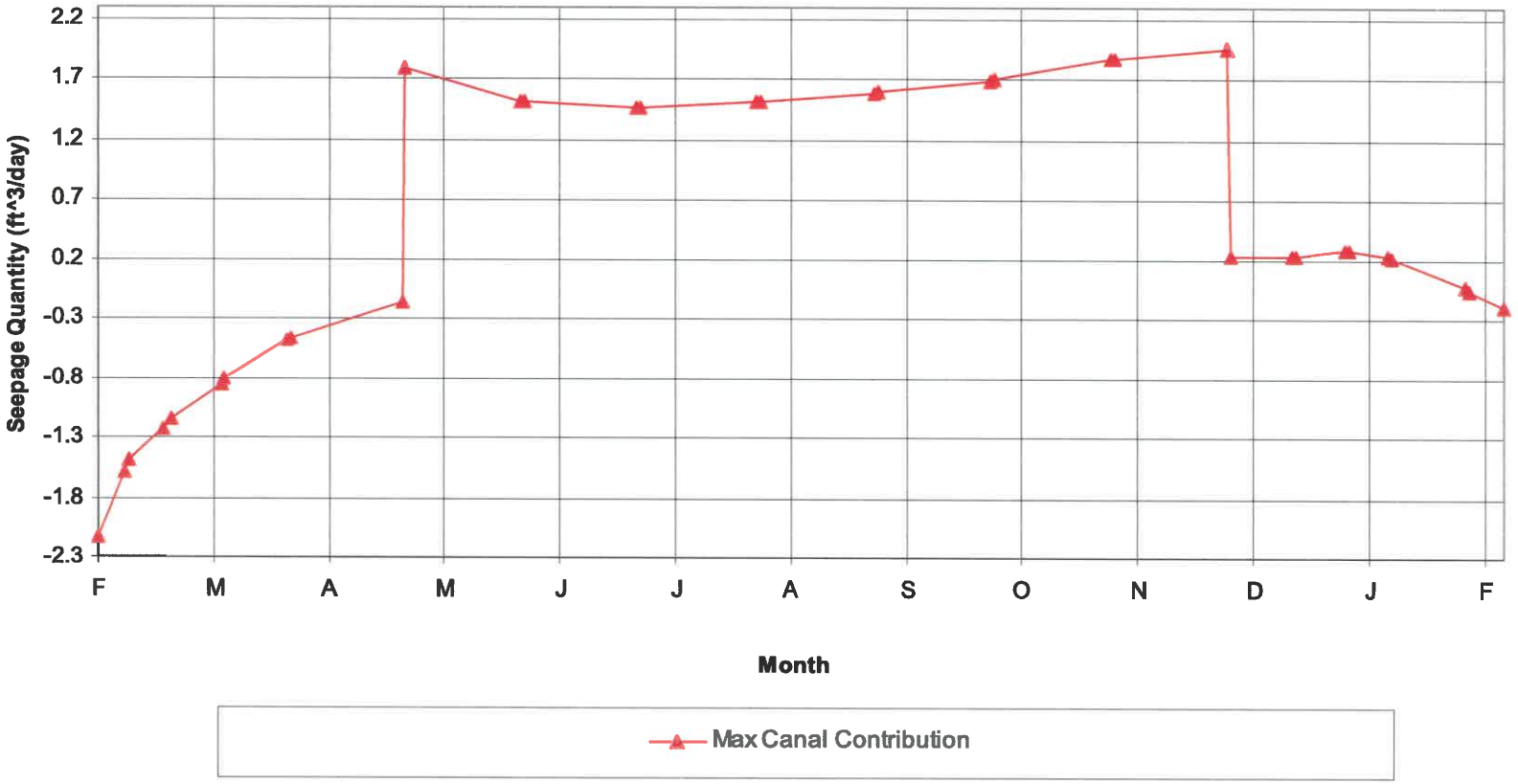
Graphics by: ESS
Project No. 72834

Date: 04/21/09
File: 70+00-Plate22_BC

Evaluation of Cutoff Wall Impact on Groundwater Recharge
Sacramento River East Levee

PLATE 22

Canal Contribution to Groundwater Recharge



Notes:

1. Seepage quantities were calculated using a flux line placed along the perimeter of the canal cross section. Positive and negative quantities indicate flow from and into the canal, respectively.
2. Elevations in the seepage models were adjusted to a nearest mesh node. Model Elevations are lower than elevations in NAVD88 by 0.03 feet.

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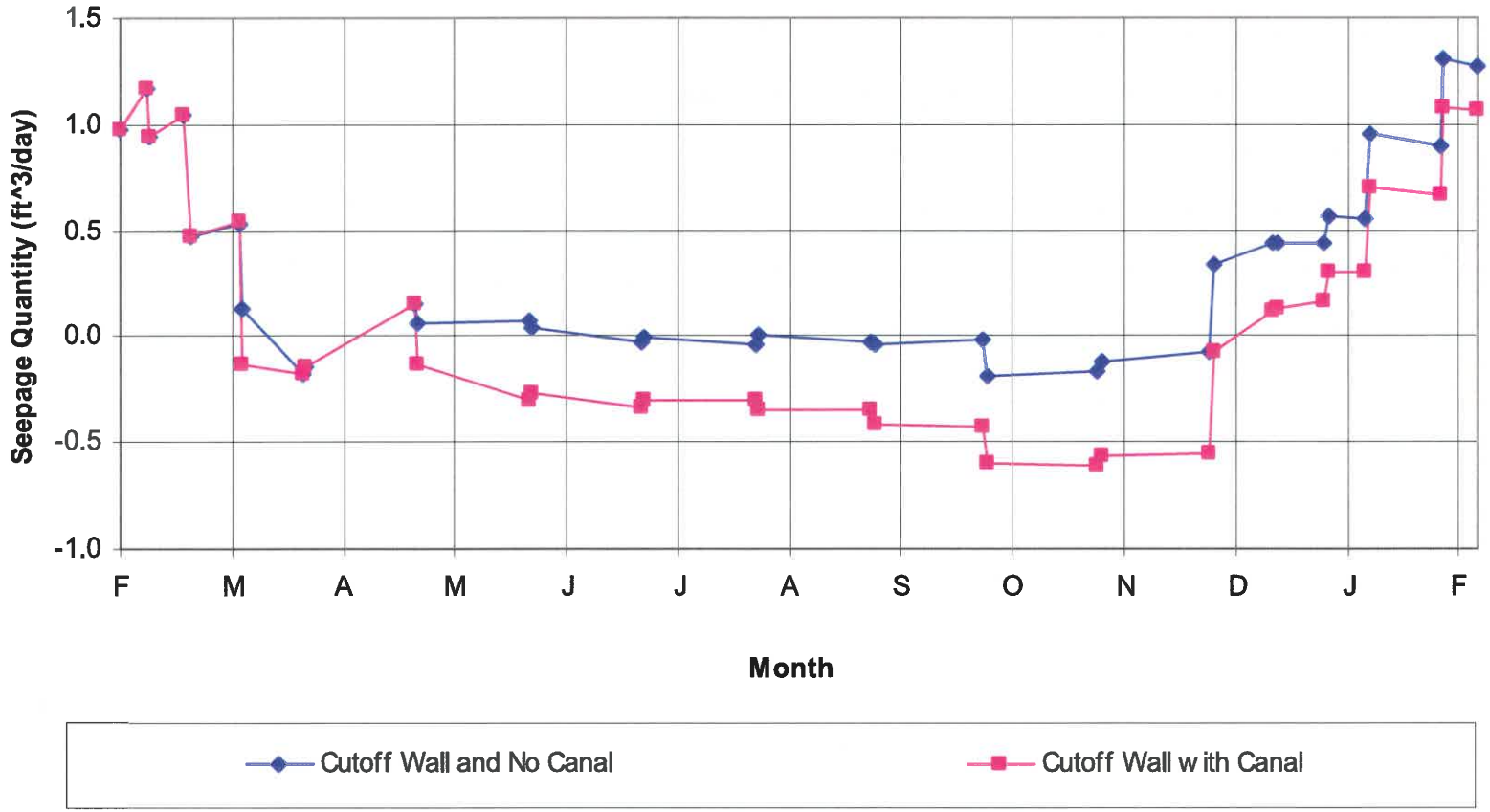
Project No. 72834

Date: 04/21/09
File: plate 23

Evaluation of Cutoff Wall Impact on Groundwater Recharge
Sacramento River East Levee

PLATE 23

Combined Impact of Cutoff Wall and Canal on Seepage Quantities



Note:
1. Seepage quantities were calculated using a flux line placed approximately 40 feet from the landside of the cutoff wall. Positive and negative quantities indicate flow from and into the river, respectively.
2. Elevations in the seepage models were adjusted to a nearest mesh node. Model Elevations are lower than elevations in NAVD88 by 0.03 feet.

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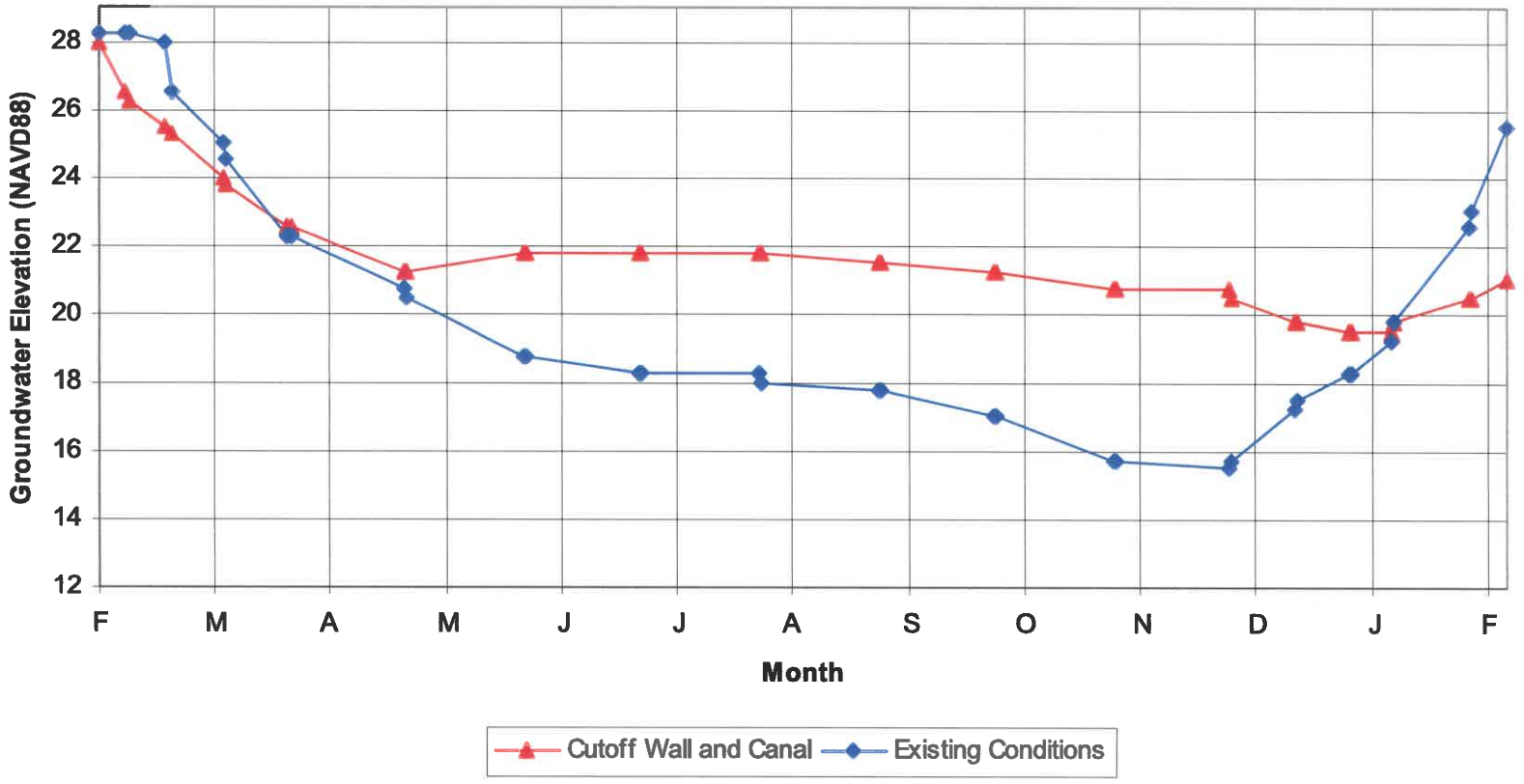
Project No. 72834

Date: 04/21/09
File: plate 24

Evaluation of Cutoff Wall Impact on Groundwater Recharge
Sacramento River East Levee

PLATE 24

Estimated Groundwater Table Elevation



Note:
1. Groundwater table elevation estimated at the locations halfway between the existing levee and the canal (~187 ft from levee toe).
2. Elevations in the seepage models were adjusted to a nearest mesh node. Model Elevations are lower than elevations in NAVD88 by 0.03 feet.

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Graphics by: ESS
Project No. 72834

Date: 04/21/09
File: plate 25

Evaluation of Cutoff Wall Impact on Groundwater Recharge
Sacramento River East Levee

PLATE 25

ATTACHMENT A

PIEZOMETER DATA
AND
GROUNDWATER ELEVATION CONTOUR MAP

FINAL OBSERVATION WELLS REPORT II
For Reaches North and South of Powerline Road

AMERICAN RIVER WATERSHED PROJECT (COMMON FEATURES), CALIFORNIA SACRAMENTO RIVER LEVEE AND BERM STRENGTHENING

Contract No.: DACW05-00-D-0003
Specifications No.:
Drawing File No.:

Prepared by:
URS.

Prepared For:

US Army Corps of Engineers
Sacramento District

24 November 2003

AUTHORITY: WATER RESOURCES DEVELOPMENT ACT OF 1996

General Observations

No major storm events causing high river stages occurred during the entire monitoring period. During both winters, the river stage rose between 15 and 20 feet. The river stages and piezometer levels were generally highest in December through the end of January and gradually decreased after January.

The results of the monitoring program are discussed and evaluated herein in three parts: a general review of the monitoring results, a comparison of river stages and piezometer levels, and a qualitative correlation between analysis results and monitoring results. Conclusions and recommendations are presented subsequently.

General Review of Monitoring Results

A continuous record of monitoring results of river stages and landside piezometer levels was obtained during this monitoring program. Only the relatively deep USACE piezometers gave meaningful results. The RD-1000 piezometers were installed too high to yield meaningful data during this period of relatively low river stages.

As noted, no significant high-river-stage events occurred during the monitoring period. Nevertheless, the piezometer data showed significant rises in the groundwater levels in response to higher river stages. The piezometer levels were always well below the ground surface on the landside of the levee, consequently no evidences of upward seepage were expected, and none were observed.

Comparisons of Piezometer Levels to River Stages

The first comparison is between piezometer levels at the landside levee toe and river stages, made for two locations. The Verona (VON) gage is located near 2F-01-15 (North of Powerline Road) as shown in Figure 2-1. The correlation between river stage recorded at VON and ground water level recorded at piezomter 2F-01-15 is depicted in Figure 5-1. Also shown in this figure is the comparison of piezometer 2F-01-19 with two gages, Bryte (BRY) and RD1000, which are located south of Powerline (see Figure 2-1). The findings from these comparisons are shown in Figure 5-1 and they indicate the following:

2F-01-15 N:

Two distinct trends are evident.

- The river stages were approximately 1 to 3 feet below the ground water levels in the piezometer during low river stage.
- The river stages were approximately 9 to 10 feet above the ground water levels in the piezometer during high river stage.
- Note that Piezometer 2F-01-15 N is installed in an area of reported incidences of seepage and boils.

2F-01-19 S:

Two distinct trends are evident.

- The river stages were approximately 1 to 1.5 feet below the ground water levels in the piezometer during low river stage.
- The river stages were approximately 4 to 5 feet above the ground water levels in the piezometer during high river stage.
- Note that no incidence of seepage and boils were reported at the location of this piezometer

The subsurface conditions at these two piezometer locations are shown in Figures 5-1 b and 5-1c. The sand aquifer in 2F-01-15N and 2F-01-19S starts at depths of 73.5 feet and 32.5 feet, respectively. The soil above the sand aquifer is fine grained soil consisting of clay, silt, and silty sand. The difference between the river stage and water level at the piezometer during the peak river stage is higher for piezometer 2F-01-15N for than piezometer 2F-01-19 S. The reason for the more pronounced time lag in Piezometer 2F-01-15 N is probably caused by the thicker and less pervious blanket which slows the percolation time.

Comparison of Water Levels between Near-field and Far-field Piezometers

The second comparison is between piezometer levels at different distances from the landside levee toe and river stages, at two locations. This comparison was made for piezometers relatively aligned in a transverse direction to the river.

1. Piezometers 2F-01-26 and 2F-01-28 (both north of Powerline Road) are located on the landside toe and about 250 feet from the landside levee toe, respectively. The comparison of the two readings is shown in Figure 5-2.

The ground water level at the near-toe piezometer is generally about 1.25 ft higher than the far-field piezometer during high river stage, while the ground water levels are similar during low river stage.

2. Piezometers 2F-01-68 and 2F-01-69 (both north of Powerline Road) are located about 50 feet and 200 feet, respectively, from the levee toe. The comparisons of these readings are shown in Figure 5-3.

The ground water level at the near-toe piezometer is generally about 3.0 feet higher than the far-field piezometer during high river stage, while the water levels are generally similar during low river stage.

Qualitative Correlation between Monitoring Results and Analysis Results

This correlation was made qualitatively only, using results of previous underseepage analyses (URS 2002d and 2002e). The scope of the monitoring program did not include additional underseepage analyses.

First, there was an apparent slight time lag of not more than several days between river stage peaks and piezometer level peaks, as seen in Figure 5-1. This amount of time lag was expected based on transient seepage analyses. Considering that a high river stage typically lasts several days, use of steady-state underseepage analyses is justified and is not expected to lead to any significant conservatism in analysis results.

Second, as expected, the measured piezometer levels resemble the river stages but show lower amplitude. This is expected as a result of seepage head losses in the aquifer between the seepage entrance point and the landside measuring location. For the same reason, the piezometer levels farther from the levee toe are lower than those near the levee.

Conclusions

The monitoring results demonstrate the rapid response of landside seepage conditions to changes in river stages. The groundwater response to higher river stage has a short time lag and relatively smaller attenuation of the peaking amplitudes. The results did not allow any correlation between measured flood stage and surface seepage effects, because of the lack of high river stages during the monitoring period.

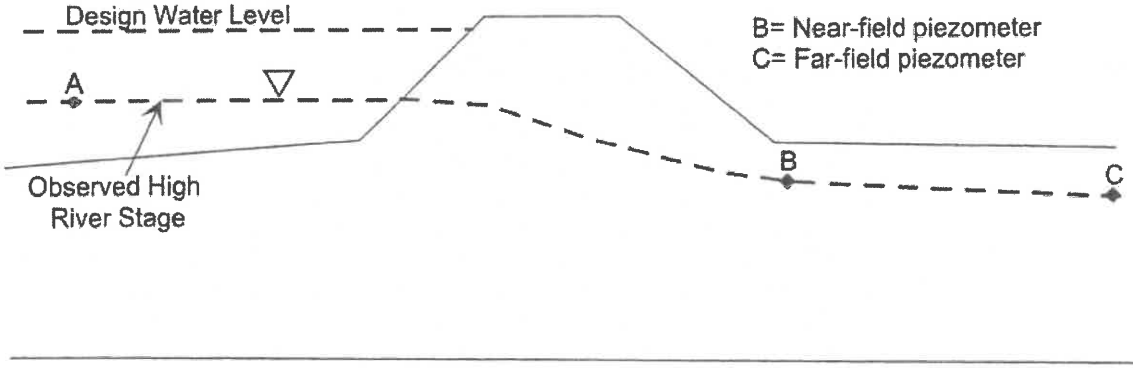


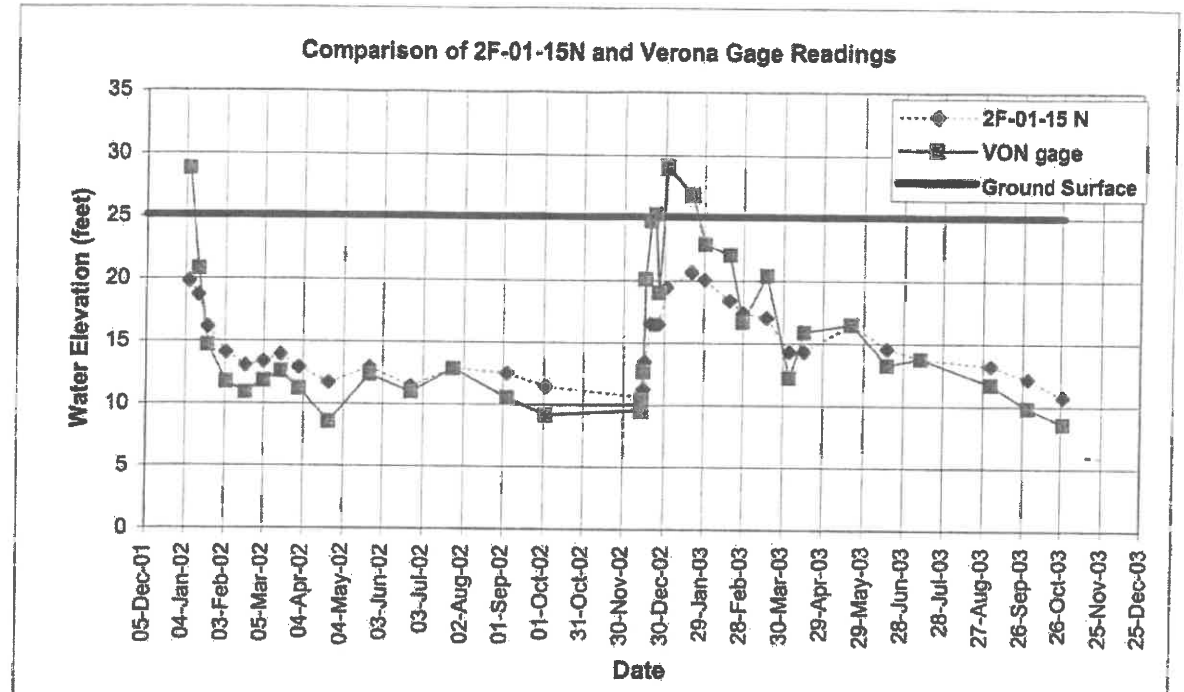
Figure 5-4- Schematic of Locations of Near-field and Far-field Piezometers

Nevertheless, the river stage, near-field and far-field piezometer readings are providing a window into a better assessment of the far-field boundary conditions and overall calibration of the model. As far as numerical seepage modeling is concerned, the observed water levels at points A, B, and C can be used for the calibration. This calibration will serve to minimize the uncertainty in selecting the appropriate boundary conditions, especially the far-field boundary condition and to provide insight into the estimate of the in-situ permeability of the soil. This calibrated model can then be used to predict the seepage response of the levee system for higher design water level.

Recommendations

Two recommendations are drawn from this monitoring program:

- We recommend the continuation of the piezometer and river stage monitoring program. However, the frequency of the monitoring program could be revisited. We also recommend that only Sacramento River and I-Street gages be monitored.



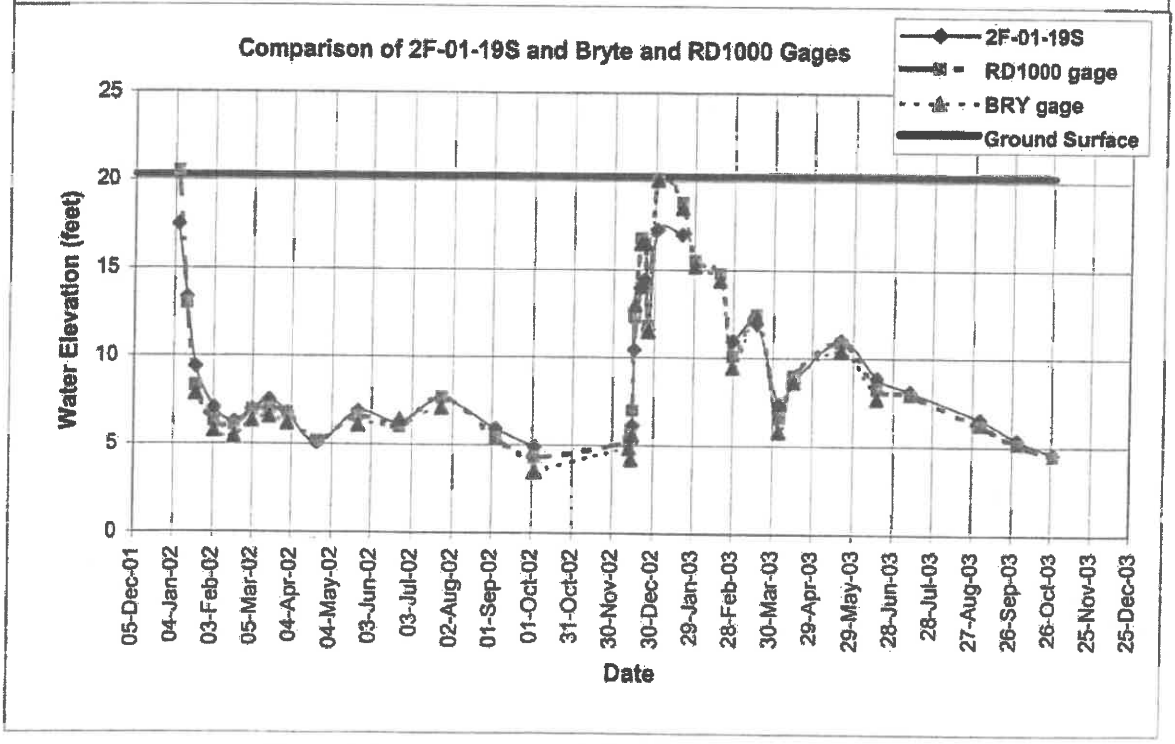
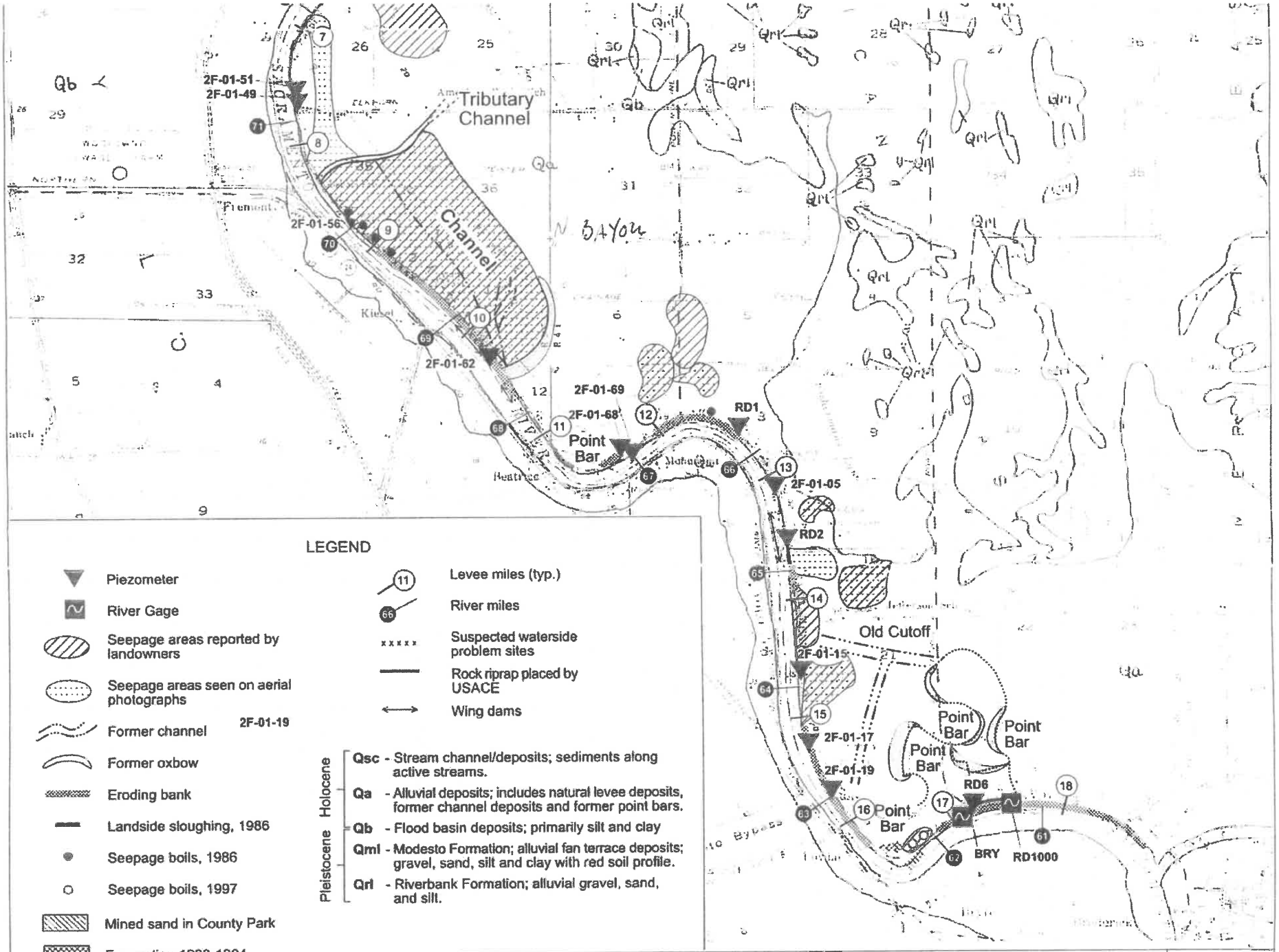


Figure 5-1; Comparison of River Stage and Piezometer Readings



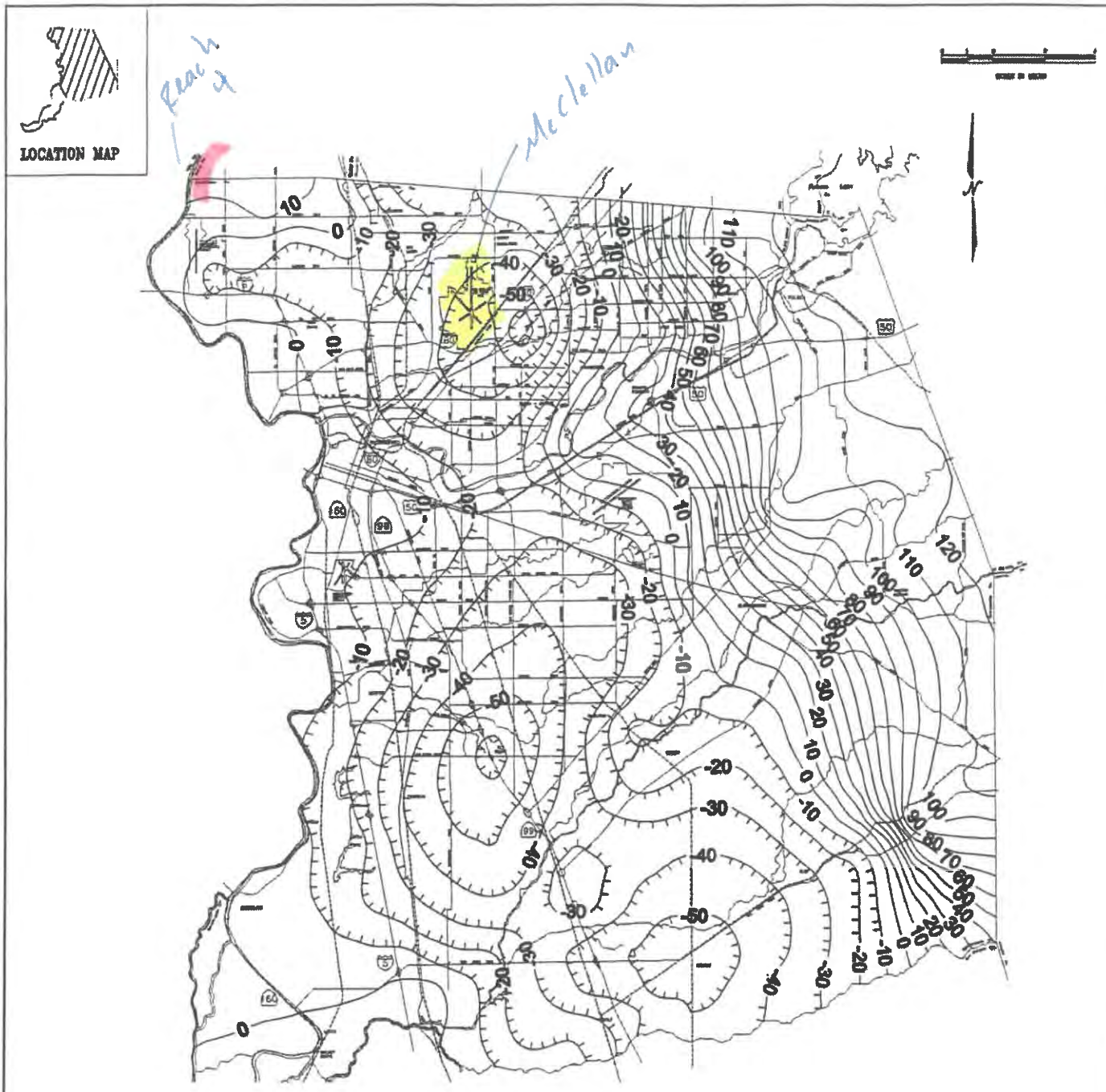
URS Project Nos. 26813892

Sacramento River Adjacent Natomas

PIEZOMETER AND GAGE LOCATIONS

Figure 2-1

26813892 00000/112003/pos



SACRAMENTO COUNTY, CALIFORNIA

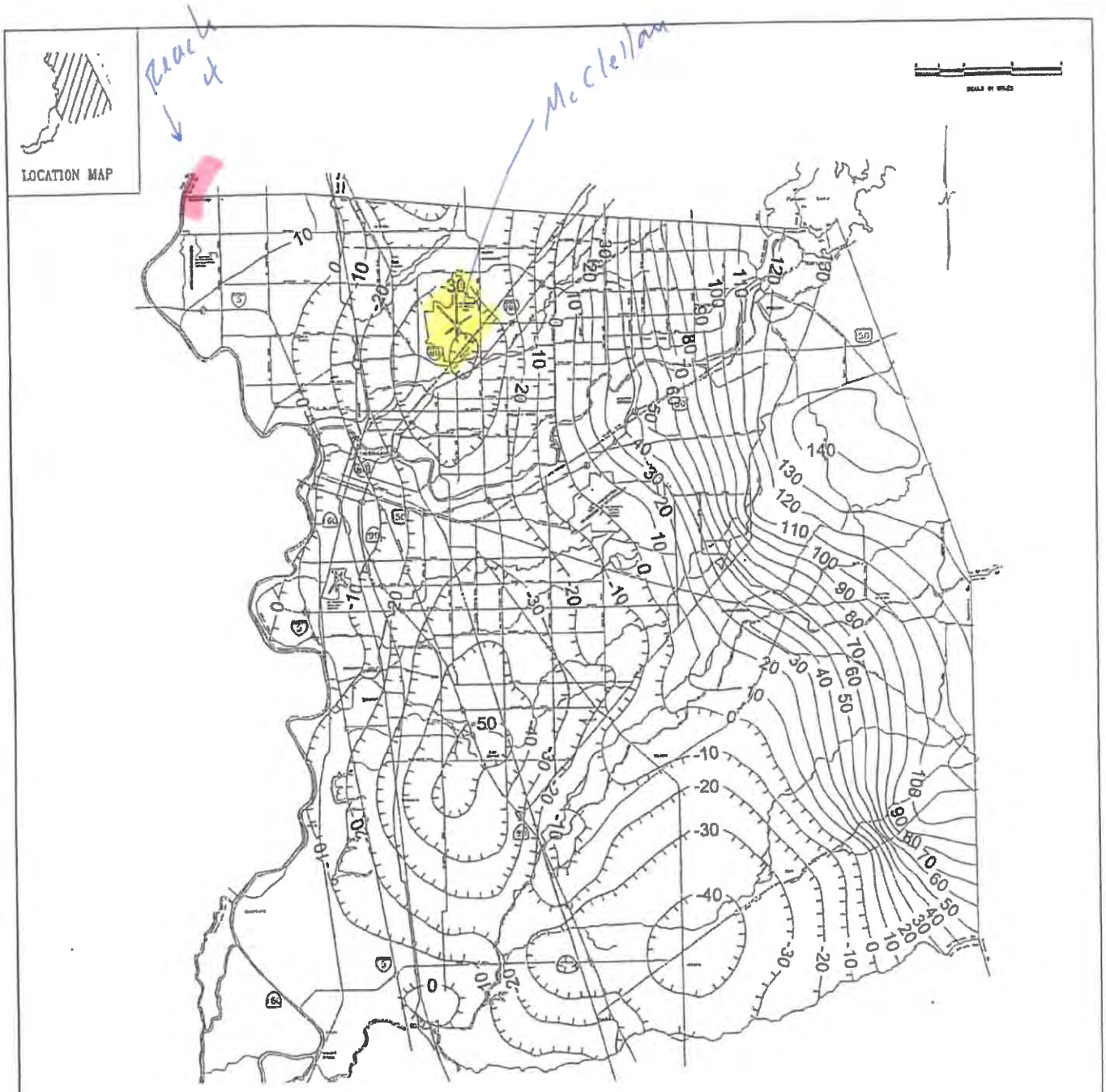
GROUNDWATER ELEVATIONS
FALL 2003
MEAN SEA LEVEL

COUNTY OF SACRAMENTO | PUBLIC WORKS AGENCY | DEPARTMENT OF WATER RESOURCES

FALL 2003

DRAWN: MARCH 2004
BY: T. Crick

NOTE: THIS GROUND WATER CONTOUR MAP IS FOR COMPARISON PURPOSES ONLY. SPECIFIC INFORMATION SHOULD BE OBTAINED BY INDEPENDENT INVESTIGATION.



SACRAMENTO COUNTY, CALIFORNIA

GROUNDWATER ELEVATIONS
SPRING 2003
MEAN SEA LEVEL

COUNTY OF SACRAMENTO | PUBLIC WORKS AGENCY | DEPARTMENT OF WATER RESOURCES

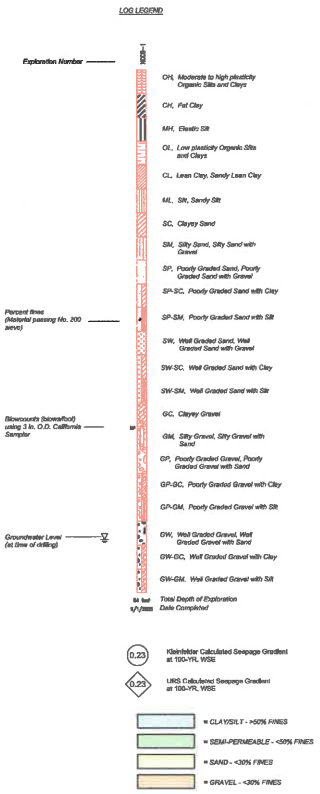
SPRING 2003

DRAWN: JULY 2003
BY: T. Crick

NOTE: THIS GROUND WATER CONTOUR MAP IS FOR COMPARISON PURPOSES ONLY. SPECIFIC INFORMATION SHOULD BE OBTAINED BY INDEPENDENT INVESTIGATION.

ATTACHMENT B

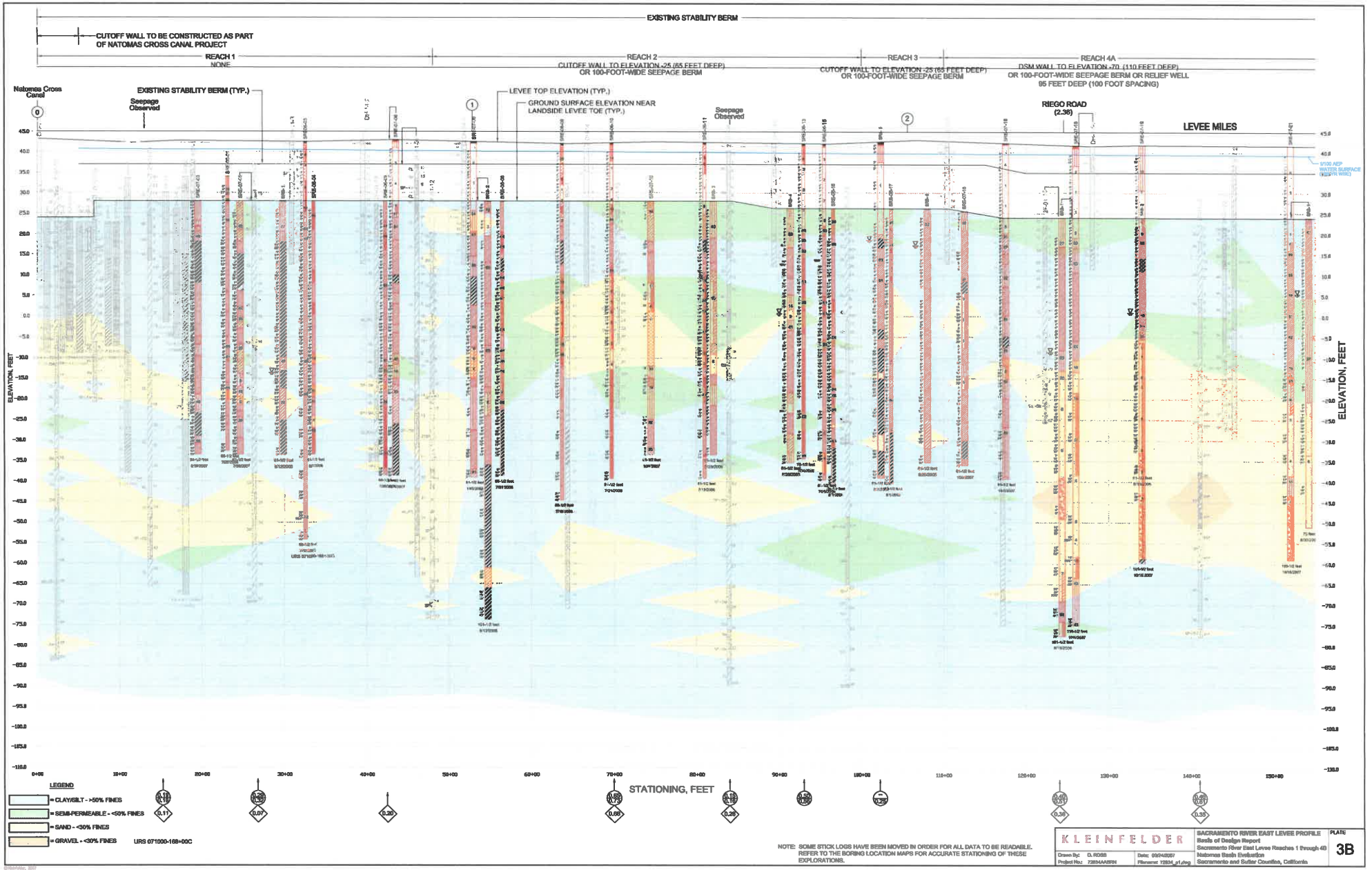
SUBSURFACE PROFILE
SACRAMENTO RIVER EAST LEVEE



Notes:

1. Base drawings for these levee profiles, obtained in August 2005 from the Sacramento District U.S. Army Corps of Engineers (USACE) and used with their permission, include stick logs of previous explorations, a levee crown profile, a landside levee toe profile, notes regarding levee performance and completed levee improvements, and elevation scale based on the 1929 National Geodetic Vertical Datum (NGVD, 1929).
2. Logs of the following explorations were added to the USACE base drawings: Kleinfelder 2006 borings (SRE-06-XX); Kleinfelder 2005 borings (SRB-XX); Kleinfelder 2003/2004 Borings S-03-1, S-03-2, S-03-3, S-03-4.
3. Locations of explorations shown are approximate. See Plate 2A through 2E for approximate plan locations of explorations.
4. The log legend shown applies to Kleinfelder 2005 borings (SRB-XX) and Kleinfelder 2006 borings (SRE-06-XX). Caution is advised in using the legend for interpretation of other explorations.
5. Logs represent general soil conditions observed at the point of exploration on the date indicated. Refer to Kleinfelder's 2005 report and Kleinfelder's 2006 report for more detail on the Kleinfelder 2005 borings (SRB-XX) and 2006 borings (SRE-06-XX).
6. Lines separating strata on logs represent approximate boundaries only. Actual transitions may be gradual.
7. No warranty is provided as to the continuity of soil conditions between individual sample locations.
8. Approximate top of boring elevations for Kleinfelder 2006 borings (SRE-06-XX) were obtained using GPS equipment survey; Kleinfelder 2005 borings (SRB-XX) were estimated using topographic data obtained by USACE 1997.
9. The 1/100 AEP and 1/200 AEP water surface profiles shown were provided by MBK Engineerson August 18, 2006. See report for an explanation of these profiles and conditions.
10. Details regarding completed levee improvements have been added to those already on the USACE levee profile base drawings and were obtained from the USACE. Extents of completed levee improvements shown are approximate and are the same as indicated on the USACE profiles. Refer to USACE as-built drawings for actual extents.

KLEINFELDER	SACRAMENTO RIVER EAST LEVEE Basis of Design Report Sacramento River East Levee Reaches 1 through 4B Natomas Basin Evaluation Sacramento and Sutter Counties, California	PLATE 3A
Drawn By: D. ROSS Project No.: 72834AABRN	Date: 09/24/2007 Filename: 72834_P1.dwg	



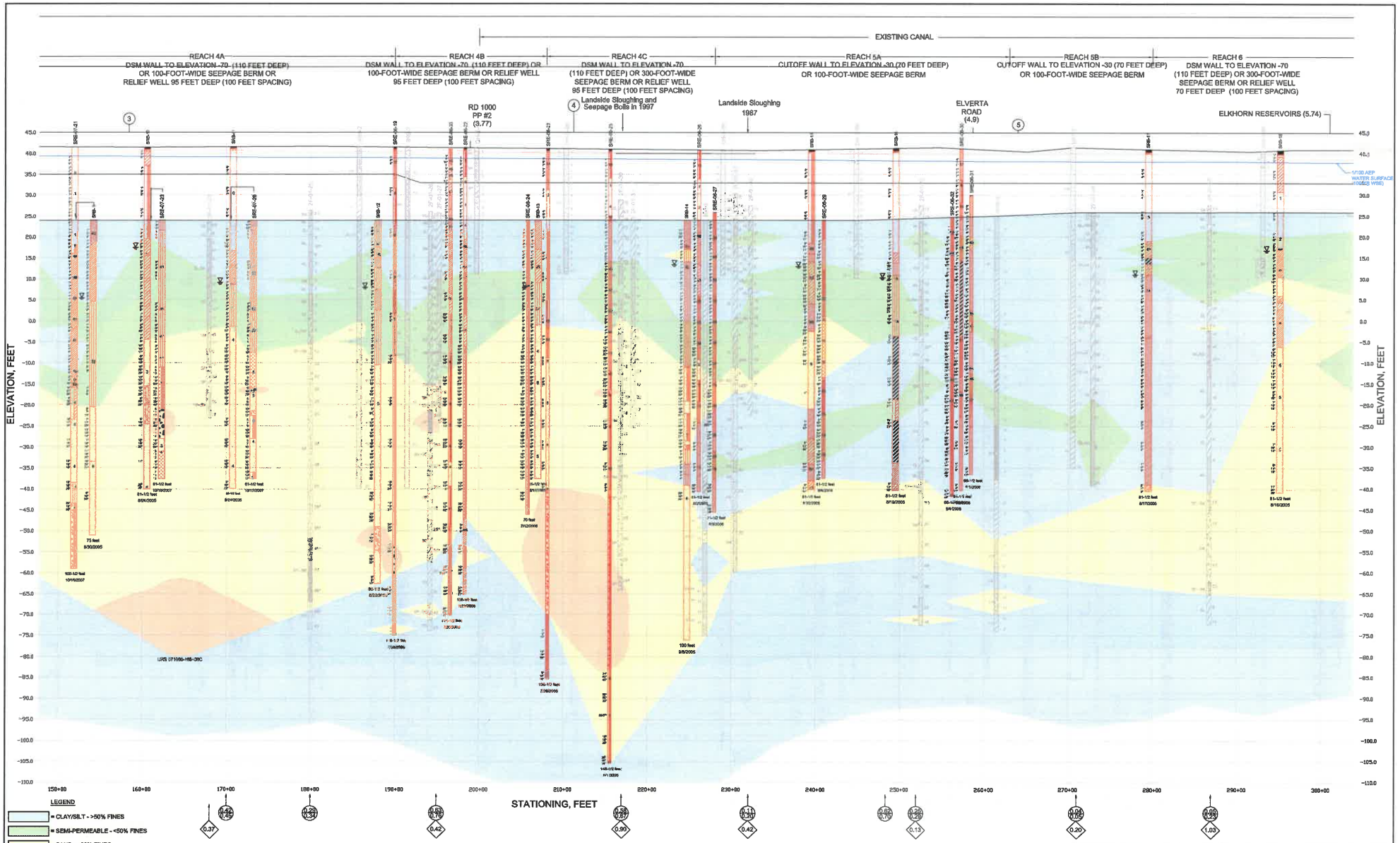
NOTE: SOME STICK LOGS HAVE BEEN MOVED IN ORDER FOR ALL DATA TO BE READABLE. REFER TO THE BORING LOCATION MAPS FOR ACCURATE STATIONING OF THESE EXPLORATIONS.

KLEINFELDER

Drawn By: D. ROSS
Project No: 72834A65RN
Date: 09/04/2007
Filename: 72834_pf.dwg

SACRAMENTO RIVER EAST LEVEE PROFILE
Basis of Design Report
Sacramento River East Levee Reaches 1 through 4B
Natomas Basin Evaluation
Sacramento and Sutter Counties, California

PLATE 3B



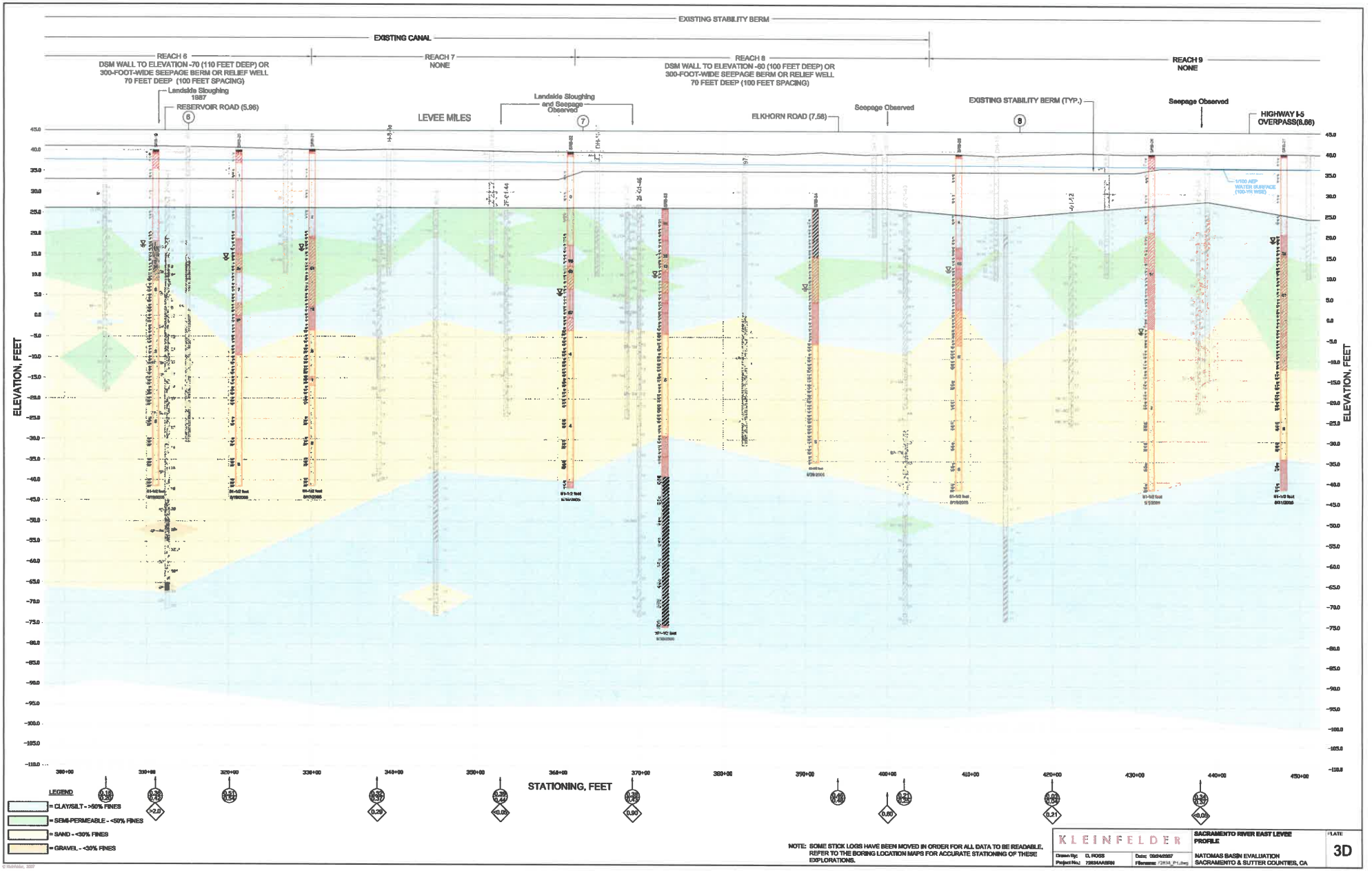
NOTE: SOME STICK LOGS HAVE BEEN MOVED IN ORDER FOR ALL DATA TO BE READABLE. REFER TO THE BORING LOCATION MAPS FOR ACCURATE STATIONING OF THESE EXPLORATIONS.

KLEINFELDER

Drawn By: D. ROSS
Project No.: 72834AASRN
Date: 08/24/2007
Filename: 72834_p1.dwg

SACRAMENTO RIVER EAST LEVEE PROFILE
Basis of Design Report
Sacramento River East Levee Reaches 1 through 4B
Natomas Basin Evaluation
Sacramento and Sutter Counties, California

PLATE
3C



NOTE: SOME STICK LOGS HAVE BEEN MOVED IN ORDER FOR ALL DATA TO BE READABLE, REFER TO THE BORING LOCATION MAPS FOR ACCURATE STATIONING OF THESE EXPLORATIONS.

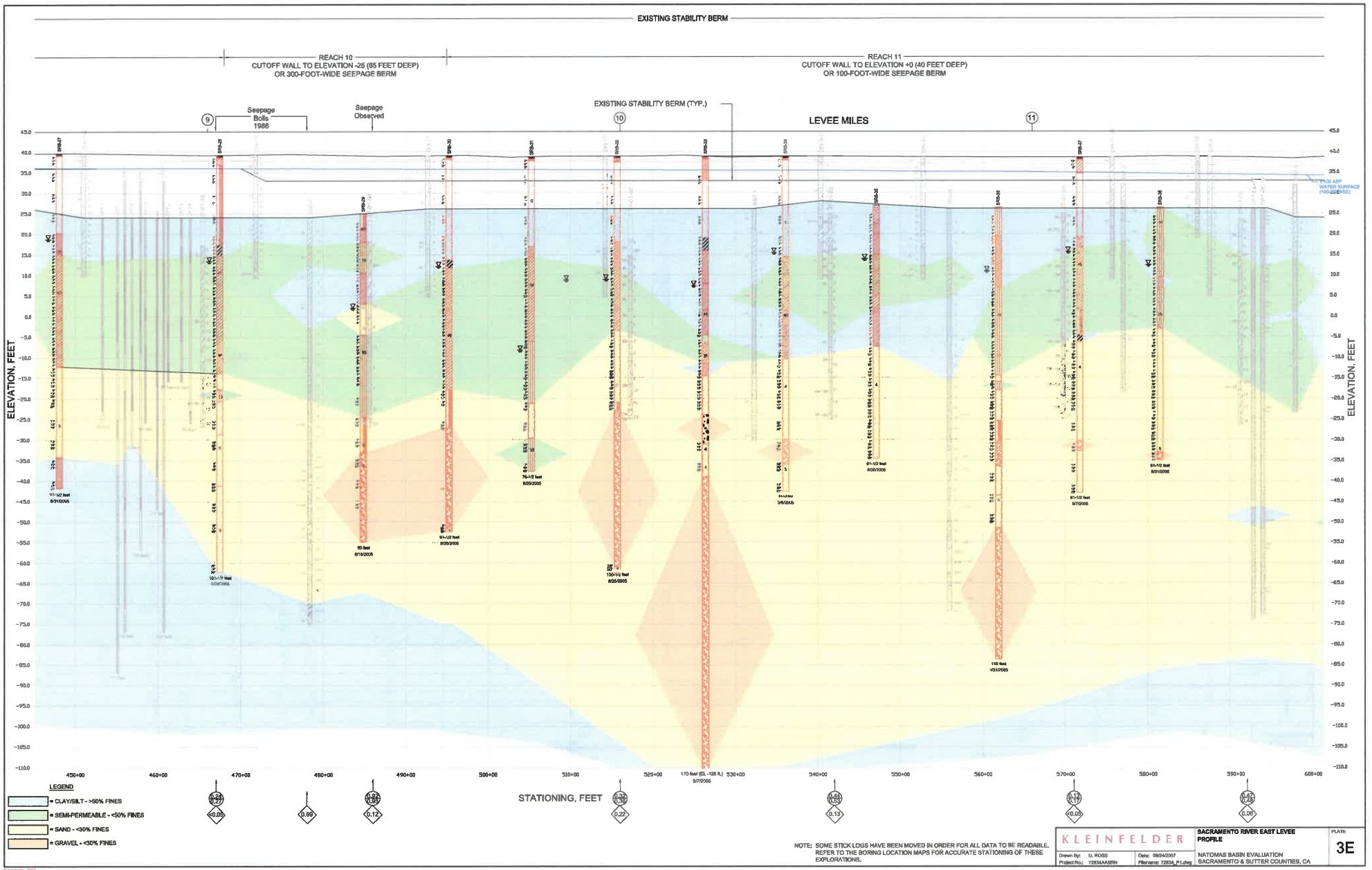
KLEINFELDER

Drawn By: D. ROSS
Project No.: 72834AASRN
Date: 09/24/2007
Filename: 72834_P1.dwg

SACRAMENTO RIVER EAST LEVEE PROFILE

NATOMAS BASIN EVALUATION
SACRAMENTO & SUTTER COUNTIES, CA

PLATE 3D



NOTE: SOME STICK LOGS HAVE BEEN MOVED IN ORDER FOR ALL DATA TO BE READABLE. REFER TO THE BORING LOCATION MAPS FOR ACCURATE STATIONING OF THESE EXPLORATIONS.

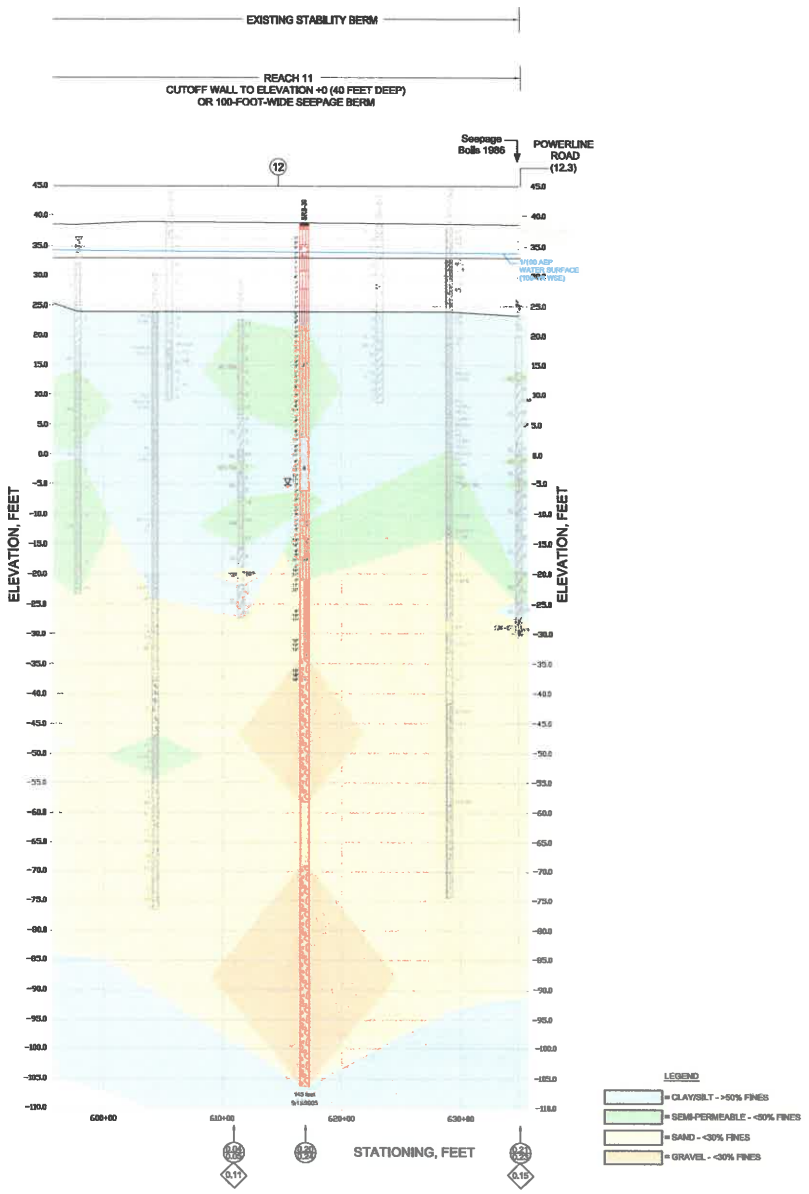
KLEINFELDER

Drawn By: D. ROSS
Project No.: 72834AABRN
Date: 09/24/2007
Filename: 72834_P1.dwg

SACRAMENTO RIVER EAST LEVEE
PROFILE

NATOMAS BASIN EVALUATION
SACRAMENTO & SUTTER COUNTIES, CA

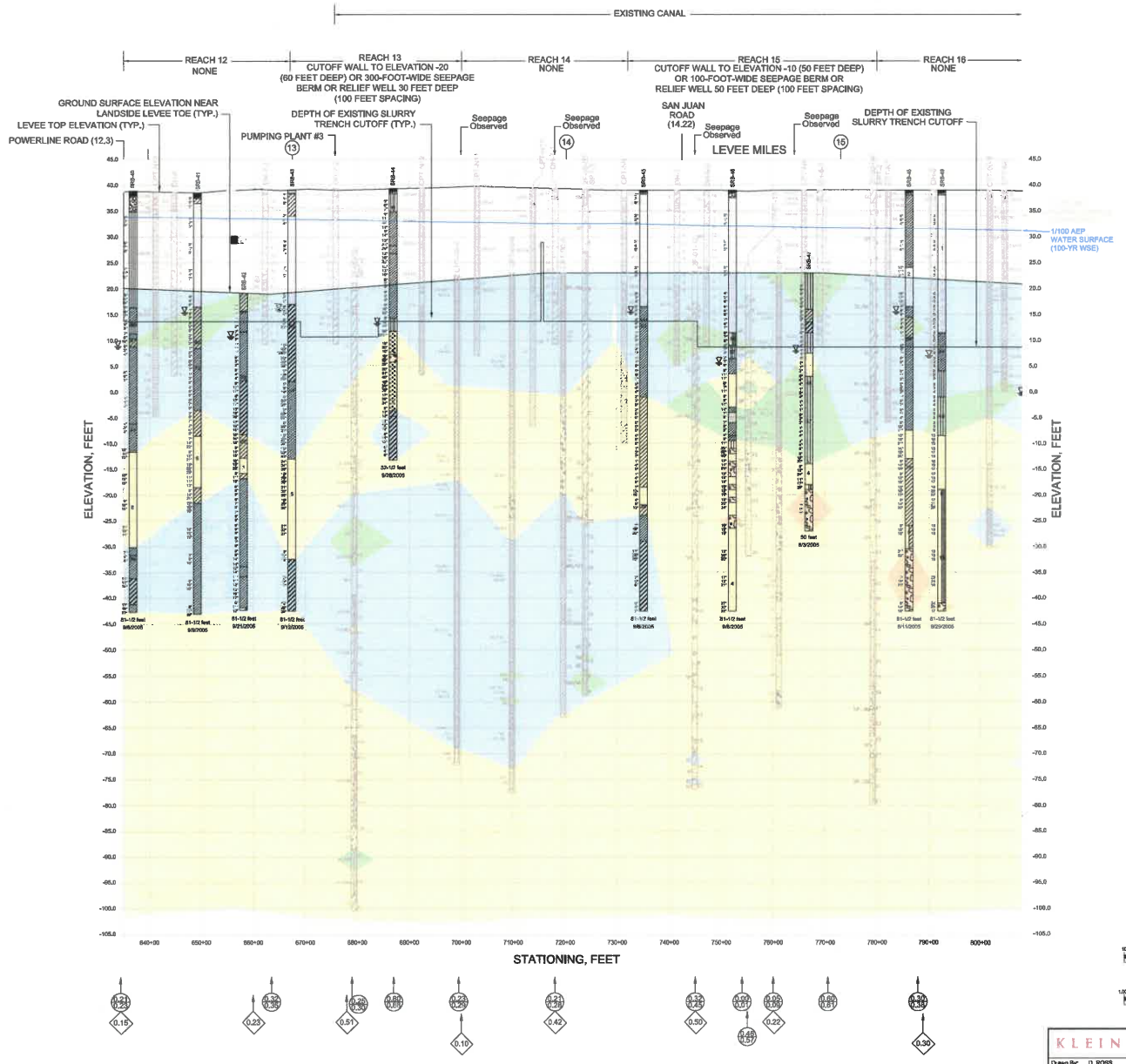
PLATE
3E



NOTE: SOME STICK LOGS HAVE BEEN MOVED IN ORDER FOR ALL DATA TO BE READABLE. REFER TO THE BORING LOCATION MAPS FOR ACCURATE STATIONING OF THESE EXPLORATIONS.

KLEINFELDER

Drawn By: D. ROSS	Date: 05/04/2007	SACRAMENTO RIVER EAST LEVEE PROFILE	PLATE 3F
Project No.: 72834AASRN	Filename: 72834_P1.DWG	NATOMAS BASIN EVALUATION SACRAMENTO & SUTTER COUNTIES, CA	



LEGEND

- = CLAY/SILT - >50% FINES
- = SEMI-PERMEABLE - <50% FINES
- = SAND - <30% FINES
- = GRAVEL - <30% FINES

APPROXIMATE VERTICAL SCALE: 1 Inch = 10 ft.

APPROXIMATE HORIZONTAL SCALE: 1 Inch = 1,000 ft.

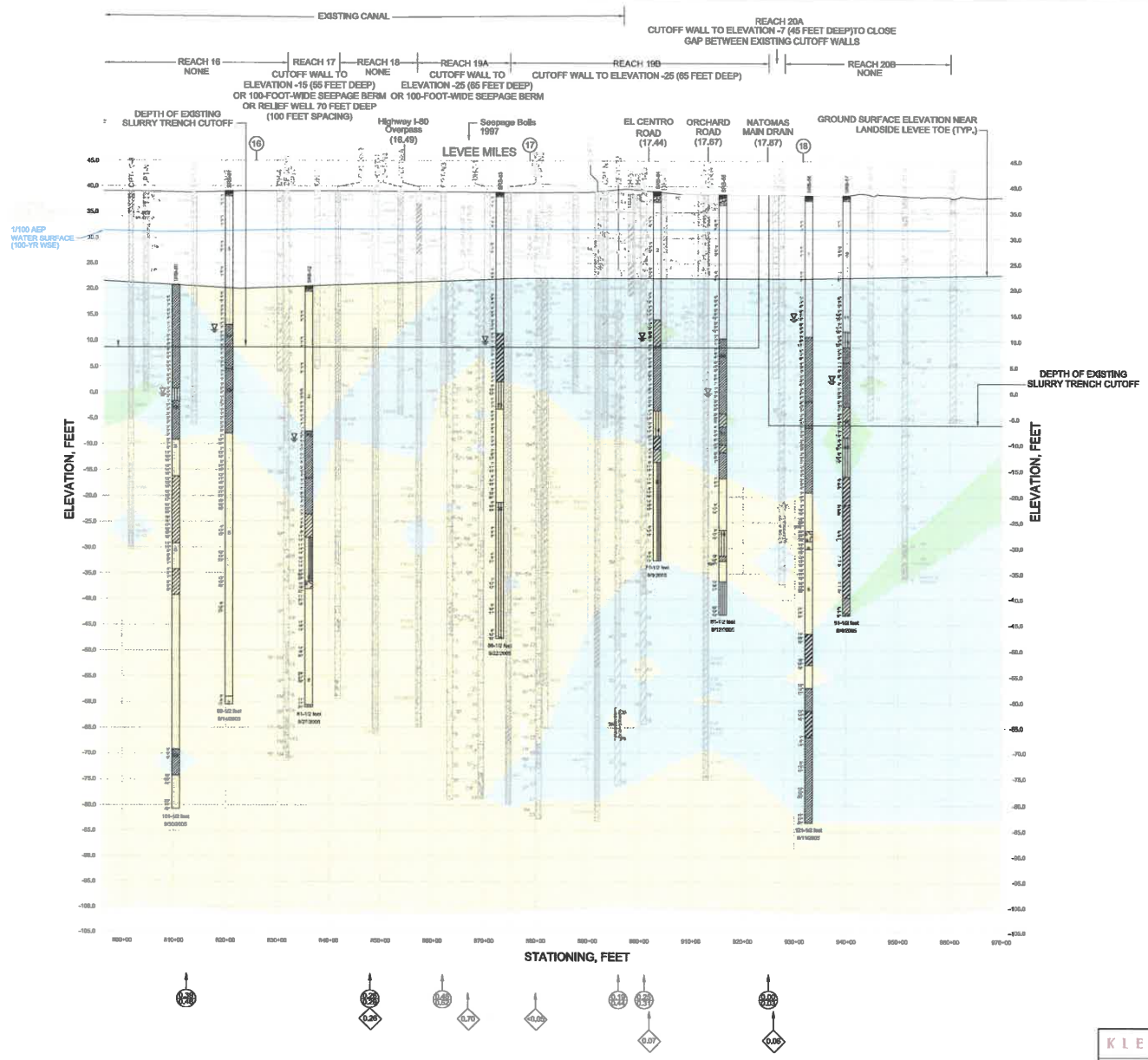
KLEINFELDER

Drawn By: D. ROSS
Project No.: 72834AASRN
Date: 09/24/2007
Filename: 72834_P2.dwg

SACRAMENTO RIVER EAST LEVEE
PROFILE

NATOMAS BASIN EVALUATION
SACRAMENTO & SUTTER COUNTIES, CA

PLATE
3G



KLEINFELDER

SACRAMENTO RIVER EAST LEVEE
PROFILE

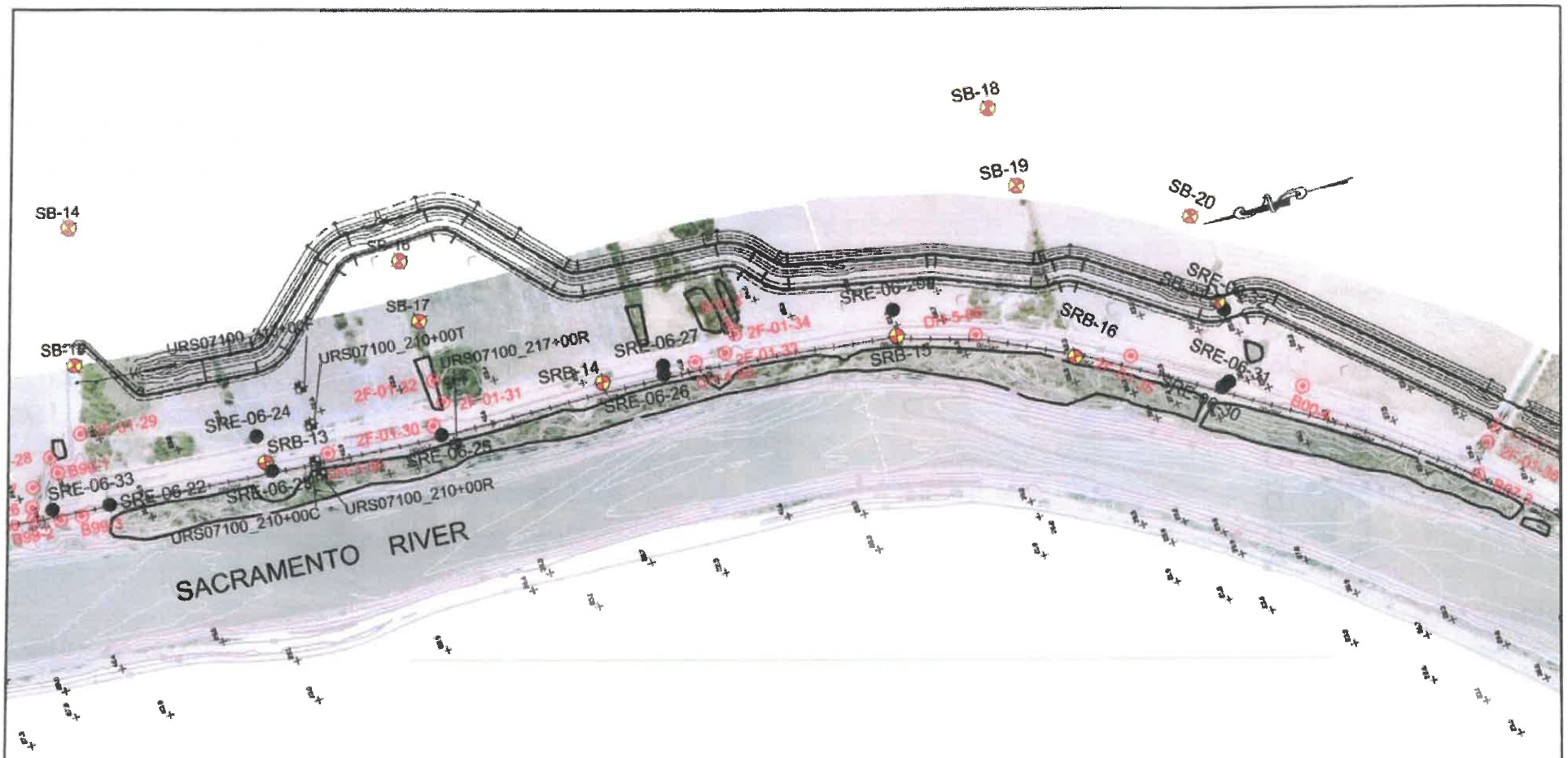
NATOMAS BASIN EVALUATION
SACRAMENTO & SUTTER COUNTIES, CA

Drawn By: D. ROSS
Project No.: 72934/ASRN
Date: 09/24/2007
Filename: 72934_pf.DWG

PLATE
3H

ATTACHMENT C

PROPOSED CANAL PLAN



LEGEND

- Approximate Exploration Location (Current Study)
- Approximate URS Exploration (2007)
- Approximate Exploration Location (KA 2006)
- Approximate Exploration Location (KA 2005)
- Approximate Exploration Location (Previous Studies)

APPROXIMATE SCALE: 1 inch = 500 ft

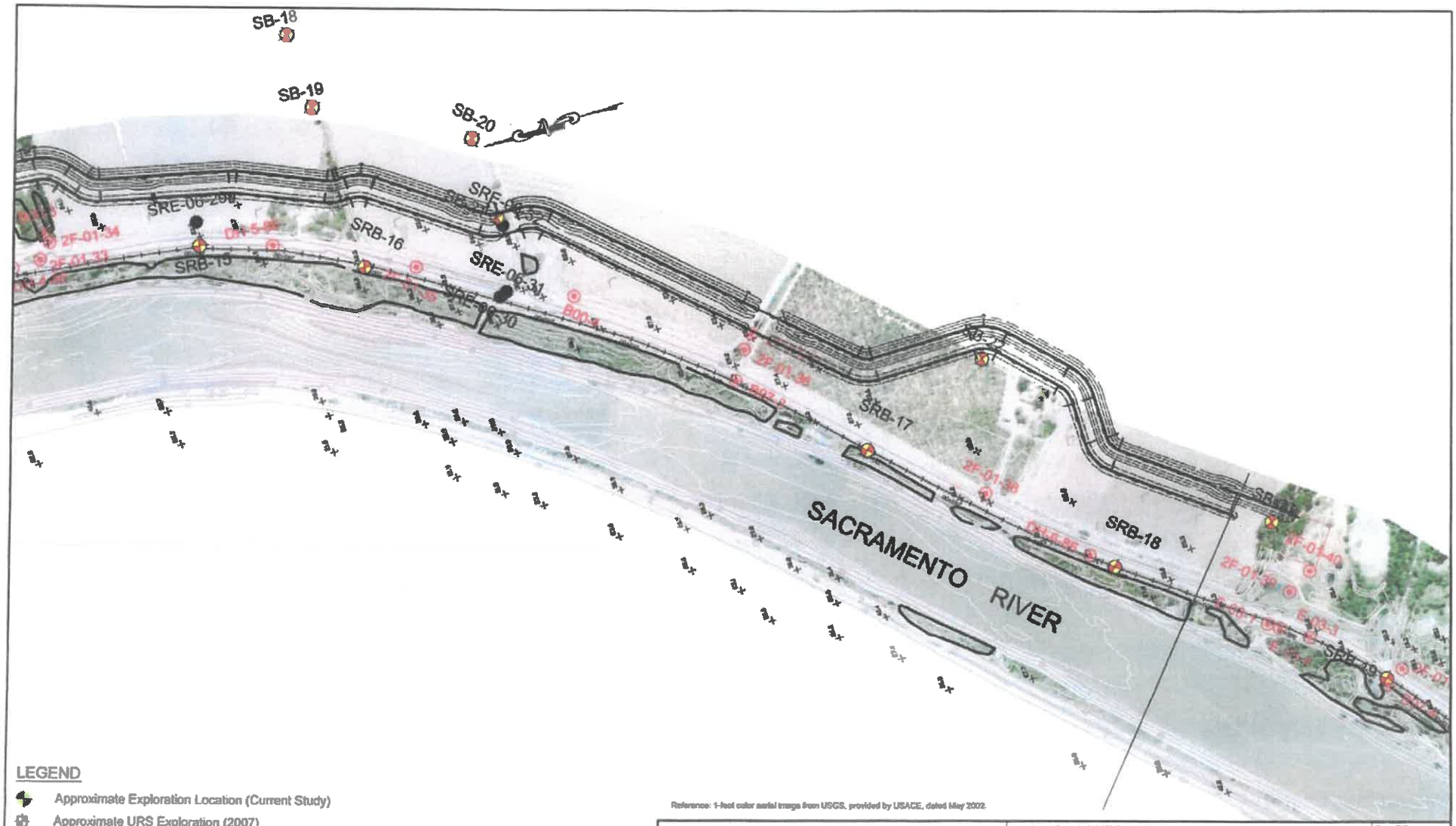
Reference: 1-foot color aerial image from USGS, provided by USACE, dated May 2002

KLEINFELDER

Drawn By: D. ROSS
Project No.: 58824/PSRE
Date: 10/21/2005
Filename: 58824SAC2.dwg

BORING LOCATION MAP
SACRAMENTO RIVER
EAST LEVEE
NATOMAS BASIN EVALUATION
SACRAMENTO AND SUTTER COUNTIES, CALIFORNIA

PLATE
1



Reference: 1-foot color aerial image from USGS, provided by USACE, dated May 2002.

KLEINFELDER

Drawn By: D. ROSS | Date: 10/21/2005
Project No.: 58824/PSRE | Filename: 58824SAC2.dwg

BORING LOCATION MAP
SACRAMENTO RIVER
EAST LEVEE
NATOMAS BASIN EVALUATION
SACRAMENTO AND SUTTER COUNTIES, CALIFORNIA

PLATE 2