SJAFCA
San Joaquin Area FLOOD CONTROL Agency

February 23, 2015

Alicia Kirchner, Chief
Planning Division, Sacramento District
U.S. Army Corps of Engineers
1325 J Street, Room 902
Sacramento, CA 95814

LOWER SAN JOAQUIN RIVER FEASIBILITY STUDY

Thank you for all of the work that the U.S. Army Corps of Engineers continues to do in support of flood risk reduction for the Lower San Joaquin River. I am writing today to ask that you consider including the language in the attached document in the draft Lower San Joaquin River Feasibility Study and joint EIS/EIR scheduled to be released at the end of this month. One of our supporting local agencies, Reclamation District 17, has asked that this language be included as a CEQA-only section in order to keep, as broad as possible, the discretion of the agencies that will need to certify the document under CEQA.

SJAFCA remains excited to see the draft document scheduled to be released at the end of the month and will be traveling to Washington DC next week to support our request for additional funding from the USACE Workplan to allow completion of the study.

Please do not hesitate to contact me if you have any questions.

Giotto

JAMES B. GIOTTONINI
EXECUTIVE DIRECTOR

JBG:dc

Attachment

cc: Scott Shapiro, Downey Brand
Dante Nomellini, Nomellini, Grilli & McDaniel
Eric Koch, Department of Water Resources

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SAN JOAQUIN AREA FLOOD CONTROL AGENCY
SAN JOAQUIN RIVER BASIN LOWER SAN JOAQUIN RIVER

STATEMENT OF DIFFERENT TREATMENT OF ALTERNATIVES IN ENVIRONMENTAL IMPACT REPORT (CEQA)

The U.S. Army Corps of Engineers (USACE) and its non-Federal sponsors, the San Joaquin Area Flood Control Project (SJAFCA), and the State of California Central Valley Flood Protection Board, propose to improve flood risk management in the Lower San Joaquin River Basin. The USACE and SJAFCA have prepared an Integrated Interim Feasibility Study and Joint Environmental Impact Statement (EIS)/Environmental Impact Report (EIR) for the proposed Lower San Joaquin River Flood Risk Management Project. The joint EIS/EIR is intended to meet the requirements of both the National Environmental Policy Act ("NEPA") and the California Environmental Quality Act ("CEQA"). SJAFCA prepared this Statement to the Environmental Impact Report in order to include solely for CEQA purposes the alternatives for reducing flood risk in RD17 which due to the USACE analysis of EO11988 were screened from the final set of alternatives in the joint EIS/EIR. Reducing flood risk in RD 17 is critical to the integrity of the flood control system for the entire feasibility study area and needs to be accomplished with or without federal assistance. The RD 17 improvements may be constructed separately from any USACE funded project. The two alternatives retained for CEQA purposes are 7b and 9b with the variation of excluding what has been referred to the secondary levee at the confluence of Old River and the San Joaquin River.

The USACE and SJAFCA conducted the Interim Feasibility Study and followed the Federal planning process for the development of water resource projects in order to identify a Tentatively Selected Plan (TSP) recommendation to Congress for authorization. The overall purpose of the proposed flood management project is to reduce flood risk to urban and urbanizing parts of the study area as further explained in Chapter 3 of the Integrated Feasibility Study/Joint EIS/EIR. The final array of alternatives involve improving levees or constructing new levees located in the base 1% (1/100) annual chance exceedance (ACE) floodplain.

During the Feasibility Study process, a preferred alternative was identified, limited by the USACE determination to screen out alternatives, in order to proceed with the TSP. The TSP reflects the identification of Alternative 7a as the NED Plan which serves to set the level of federal participation in a project resulting from the Feasibility Study. SJAFCA, however, has confirmed with its local participating agencies that while Alternative 7a provides flood risk management for North and Central Stockton, Alternative 7a does not meet the non-Federal sponsor's objectives of flood risk management and SB 5 compliance for RD 17 and the Cities of Lathrop and Manteca because Alternative 7a excludes flood control improvements and flood management for RD 17.

By contrast, the local non-Federal sponsors support Alternative 7b and 9b as consistent with their project objectives to include flood protection for RD-17. As described in further detail in Chapter 3 of the Feasibility Study, Alternatives 7b and 9b included flood risk management improvements in RD 17. Alternatives 7b and 9b would implement the same levee improvements

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and closure structures as Alternatives 7a and 9a but would include levee improvements on the existing RD17 levees and approximately 2.2 miles of new levees (dry land or tie-back levees) extending to the east. The Alternatives 7b and 9b new levees would include a cut off wall to address potential seepage issues. Although Alternatives 7b and 9b include RD-17 improvements consistent with the local sponsor's objectives, the local sponsors are not proposing a secondary levee at the confluence of Old River and the San Joaquin River ("Secondary Levee").

Accordingly, as the CEQA Lead Agency, SJAFCA is evaluating Alternatives 7a and 7b and 9a and 9b in the Joint EIS/EIR in order to provide a full evaluation of the environmental impacts associated with the TSP, should the Federal government fund the NED Plan, as well as Alternatives 7b or 9b without the secondary levee which would be consistent with the local sponsor's proposed project and project objectives. Additionally, this statement to the EIR evaluates the environmental impacts of elimination of the secondary levee on Alternatives 7b and 9b.

The secondary levee at the confluence of Old River and the San Joaquin would be redundant to the existing levee. The existing levee is necessary to avoid significant changes in the hydraulics of the flow split between Old River and the San Joaquin. More flow in the San Joaquin will increase flood risk to downstream areas including the City of Stockton, the Stockton Port and the Regional Wastewater Treatment facilities. The redundant levee would greatly increase the cost of construction and maintenance in that the existing levee will in any event need to be improved to provide the needed level of protection for downstream areas. Construction of the secondary levee would also add significantly to the impacts to the ongoing agricultural operations.

Improvement of the existing RD 17 levees with the dry land / tie-back is the only practicable alternative to reduce the flood risk to the 43,000 residents and billions of dollars of public and private investment including in particular Interstate 5, Highway 120, the San Joaquin County Hospital, the San Joaquin County Jail and correctional facilities, numerous schools, health care facilities, the City of Lathrop Civic Center, fire stations and police facilities. As flood risks increase due to climate change or re-evaluation of potential flood flows the area dependent upon protection from the RD 17 levees will extend to the north and east encompassing the Sharpe Army Depot, critical rail facilities and major portions of the City of Stockton including the Port and the Regional Wastewater Treatment Facilities.

Failure to increase the flood protection for RD 17 also increases the risk of flood damage to the environment and human health and safety. Loss of life, injury and disease for humans, pets and terrestrial species, stranding and predation of fish species including those with special status, loss of riparian habitat along the levee breaks and those areas eroded by the high velocity flows in the vicinity of the levee break, contamination of flood waters both within the flooded areas and the areas to which the flood waters will be discharged and severe vandalism and looting are all significant impacts that flow from failure to provide adequate flood protection for RD 17.

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Attachment Three

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Analysis of Development Risk Resulting from Levee Improvements to ULDC Standards

Prepared for: **Cities of Lathrop and Manteca** *April 9, 2015*

Prepared by: **Dave Peterson**
Reviewed by: **Mike Rossiter**

Chapter 3 of the USACE *Lower San Joaquin River Project Interim Report, San Joaquin County, California, Draft Integrated Interim Feasibility Report/Environmental Impact Statement /Environmental Impact Report*, February 2015 (LSJRFS), evaluates policy compliance of Federal participation in a project to improve the RD 17 levees relative to Executive Order 11988. The primary concern identified by the USACE regarding EO 11988 compliance is the inducement of urban development within the already developed and levee protected floodplain. USACE estimated that there are approximately 12,500 acres of levee-protected land within RD 17 that could be urbanized, thereby increasing the population protected by RD 17 levees.

The non-Federal sponsors for the study, SJAFCA and the California Central Valley Flood Protection Board (CVFPB), were concerned that the 43,000 residents and billions of dollars of public and private assets that are already in place would be deprived of additional flood risk reduction as a result of the USACE evaluation. The quantity of developed but not yet urbanized land in RD 17 raised issues for USACE of whether inclusion of RD 17 would be compliant with EO 11988. For this reason, USACE excluded RD 17 alternatives from the final array of alternatives, and the non-Federal sponsors reluctantly accepted the exclusion to avoid further delay and/or cancelation of the study and to facilitate release of the draft for concurrent public and vertical team review. However, the non-Federal sponsors conditioned their acceptance on further consideration of the issue either within the LSJRFS, or in a subsequent study focused on RD 17. The non-Federal sponsors believe that EO 11988 should not be an obstacle to further federal investment in the RD 17 levees.

This memorandum is intended to address one of the issues at the core of EO 11988 in which a levee improvement project is said to induce growth in the floodplain and increase economic risk. This concern is shared by the State of California. The hypothesis being that expected annual damages (EAD) would decrease in the years immediately following completion of a levee improvement project, but that induced urban growth would end up increasing EAD over time, eventually exceeding without project EAD at some point in the future.

The draft LSJRFS provides the information needed to test this hypothesis, and is the basis for the analysis presented in this memorandum.

RD 17 current (2015) conditions
Developed acreage = 8,100 (based on numbers provided by Lathrop, Manteca, Stockton, and San Joaquin County)
Without project EAD = $25M/yr (LSJRFS Table 3-13)
With project EAD = $1M/yr (LSJRFS Table 3-13)

RD 17 future conditions, without project
Developed acreage = 8,100 (SB 5 precludes growth absent 200-year protection)

RD 17 future conditions, with project
2030 developed acreage = 8,100 + 5,300 = 13,400 (LSJRFS Section 3.6.1 step 4b identifies 5,300 acres of additional development in the General Plans of the cities and county)
2070 developed acreage = 8,100 + 5,300 + 7,200 = 20,600 (LSJRFS Section 3.6.1 step 4b identifies 7,200 acres of remaining land that could potentially be developed beyond the General Plans.)

PBI assumptions:

- Assume future development is similar in character to existing development, and that EAD can simply be extrapolated in proportion to developed area. So ignoring inflation, year 2030 with-project EAD = $1M + (5300/8100)*$1M = $1.7M. Similarly, year 2070 EAD = $1M + (12500/8100)*$1M = $2.5M.
- Assume that full buildout of all vacant ground under with project conditions would occur by the 2070 LSJRFS planning horizon. This is not the plan of any of the land use authorities, but the USACE's concern is that these plans change, so full buildout is the most conservative (high side) growth assumption.
- Assume that under without project conditions that growth is held at current levels due to SB 5 growth restrictions where 200-year flood protection does not exist.
- Assume that property values escalate at 2%/yr under both with- and without-project conditions.
- Assume the project is completed by the year 2020

Figure 1 presents EAD over time. Both with- and without project EAD start out at $25M/yr. Assuming no further growth under without project conditions, EAD continues to escalate due to property inflation to $33.6M/yr in 2030 and $74.3M/yr in 2070. Under with-project conditions, EAD drops to $1.3M/yr in 2020. This is greater than the published USACE estimate of $1M/yr, because we assume that 1/3 of the 5,300 acres builds out during the 2015-2020 timeframe, and there are 5 years of escalation. By year 2030 and 2070, growth plus escalation increase the with-project EAD to $2.2M, and $7.6M, respectively. Figure 2 presents the same data without property escalation.

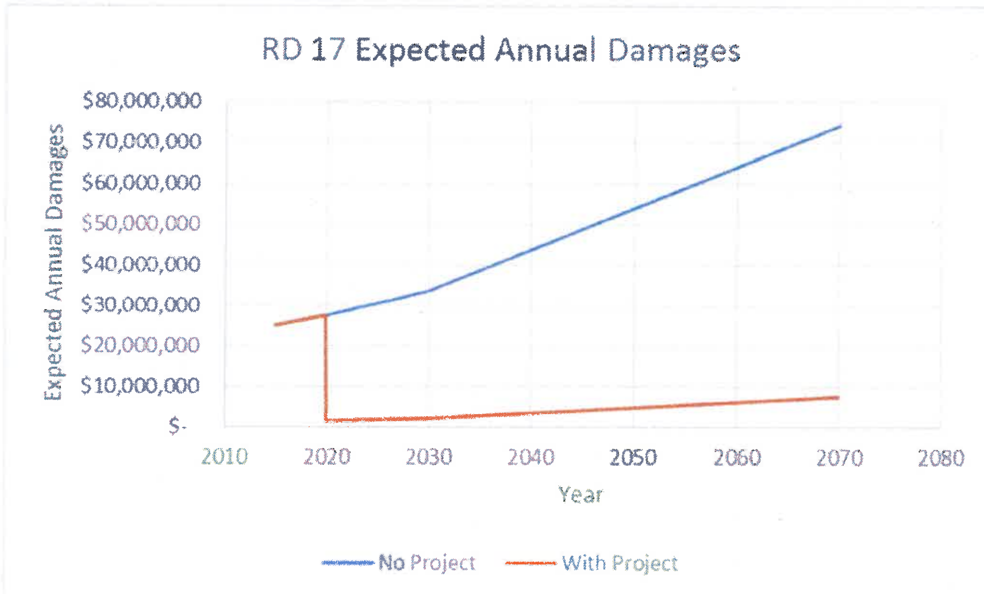

Figure 1. Comparison of residual economic risks for without- vs. with-project (assumes 2% property inflation).

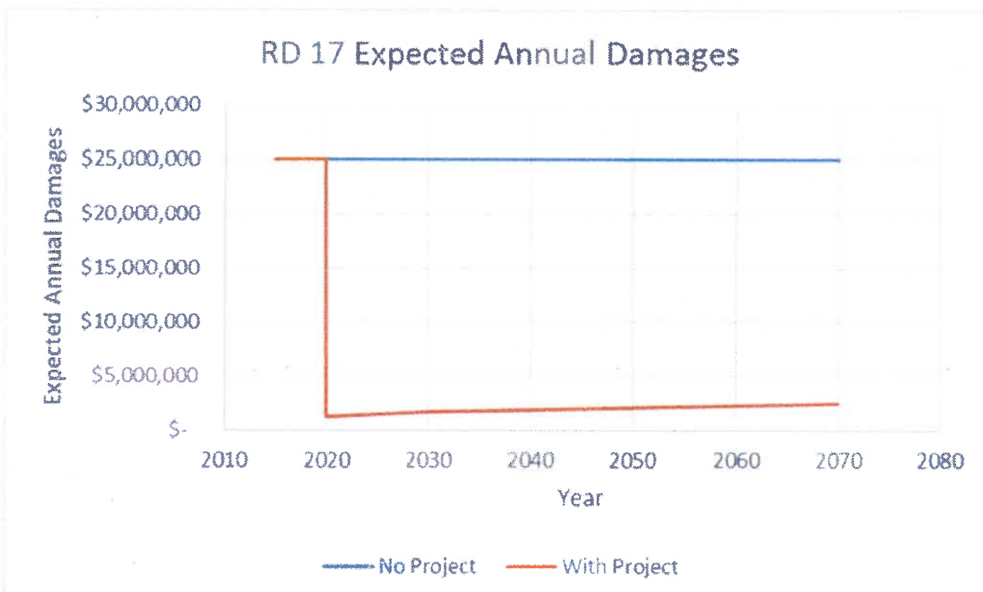

Figure 2. Comparison of residual economic risks for without- vs. with-project (no property inflation.

Both figures illustrate that without-project damage risk far exceeds with-project risk, and that the curves never cross. If inflation is considered, the curves diverge.

Life safety risk was not evaluated explicitly. It is reasonable to assume that life safety risk will generally trend with economic risk. However, in the case of RD 17 where geotechnical failure mechanisms dominate without-project conditions, failures are unpredictable and sudden, and evacuation is an ineffective risk management tool (LSJRFS Hydraulic Design Appendix, Section 4.7). Levee improvements under any of the LSJRFS "b" alternatives would remediate the geotechnical failure risk, so residual life safety risk would be primarily from overtopping, which can be forecasted several days in advance. So qualitatively, without- and with-project life safety risk curves are likely to diverge even more than economic risk curves.

PBI's conclusion is that both economic and life safety risk would be substantially reduced, and that this reduction would be sustained for the long term, if the RD 17 improvements included in the LSJRFS "b" alternatives are constructed, even when factoring in the most aggressive growth projections.

ATTACHMENT FOUR

TO RD 17 comments to LSRFS/DEIS/EIR

Life safety and critical infrastructure pose a significant concern for the basin. The USACE LSJRFS highlights this:

"The flood warning time varies throughout the area and is dependent on the source and type of flood event. The principal sources of flood warnings are advisories by the National Weather Service (NWS) and river stage forecasts by the California Nevada River Forecast Center (CNRFC). The flood warning time would likely be greater for an overtopping related breach than a geotechnical failure type breach. It is estimated that flooding from a geotechnical type levee breach would have little to no advance warning (less than 1 hour) and the flood wave would rapidly inundate the immediately adjacent areas. Whereas, flooding from an overtopping related breach would likely have 24 to 48 hours of advance warning, due to forecasted reservoir operations. Therefore to answer whether the time would be sufficient to avoid loss of life and injury in critical infrastructures depends on the type and sources of flood event in the floodplain. It is highly unlikely that effective evacuation could occur if an unforeseen levee breach were to occur along the San Joaquin River or Delta Front."

"Levee breach scenarios. Inundation maps were developed for fifteen levee breach locations within the study area. These breach locations were spatially distributed throughout the study area to reflect the floodplain characteristics. All breach scenarios assume levees were overtopped without failure at all locations other than the breach location. Breaches were simulated for 50% (1/2) ACE, 10% (1/10) ACE, 4% (1/25) ACE, 2% (1/50) ACE, 1% (1/100) ACE, 0.5% (1/200) ACE, and 0.2% (1/500) ACE events. The resulting inundation maps are hypothetical simulations of levee failures and do not represent the probability of occurrence (Appendix B.2, Hydraulic Design). For evaluation of life loss consequence the study area can be divided into a breach zone, zone with rapidly rising water, and a remaining zone (Jonkman, 2008). Simulations of levee breaches at the peak stage of a 1% ACE event were used to evaluate characteristics of each zone. Breach characteristics for other event magnitudes would be similar.

Breach zone. The breach zone is characterized by destruction of buildings and the highest life safety consequence. Yonkman describes this area as having velocities greater than 6 fps and the product of depth and velocity greater than 22 ft^2 per second. For the Lower San Joaquin Feasibility study, the limit of this zone is estimated to range from 250 feet to 7,600 feet from the breach location. The results indicate a breach zone of approximately 250 feet for the Calaveras River, Mormon Slough, and upper reaches of French Camp slough. The breach zone for Lower San Joaquin River, Delta, and Lower French Camp Slough could be as *much as 7600 feet. This was based on the evaluation of the maximum velocity and maximum depths in breach simulations."*

For persons with limited-mobility (sick, infirm, incarcerated), this issue is compounded. Many of the dead from Hurricane Katrina were limited mobility persons. The jail and hospital complex off Mathews Road in RD 17 contains a high concentration of particularly vulnerable limited mobility people.

But this is not to understate the threat to other critical infrastructure. Law enforcement and fire station command and control centers could be rapidly flooded, schools which are used as emergency shelters and evacuation centers, and thousands of ordinary people would be in the breach zone.

San Joaquin County Office of Emergency Services (OES) and RD 17 have developed a model emergency response plan. However, it's effectiveness at preventing substantial human tragedy in a geotechnical failure situation is limited.

Compounding the threat to life safety is flood risk to Interstate 5 and Highway 120 which are critical evacuation routes for the region. The USAEE analysis fails to realistically account for this risk in its determination that there is no federal interest in flood protection for RD 17.

For these reasons, local, state, and Federal interests should all recognize the overriding considerations of life safety in support of further improvements to RD 17's levees.

ATTACHMENT FIVE

TO RD 17 comments to LSRFS/DEIS/EIR

The assumption that RD 17 will be fully urbanized is not supportable. The following residual risk mitigation measures are being employed by agencies in the RD 17 and should be analyzed:

1. *State & Federal Restrictions:* California Senate Bill 5 (signed 2007) prevents urban growth without 200-year protection. SB 5 precludes development unless 200-year protection exists, and institutes strong linkages between local land use and prudent floodplain management. Key among these linkages are requirements to amend local General Plans and zoning ordinances to reflect flood risk, modification to building codes, prohibition of permits and entitlements unless 200-year level of protection is demonstrated.
2. *Local Land-Use & Zoning Restrictions:* The General Plans (GPs) of San Joaquin County and the three cities in the RD 17 area limit urban growth to infill and growth at the fringe of the 3 cities. The GPs call for continued agricultural land use at all other points in the basin. Local land use policies and ordinances include numerous restrictions and approval requirements.
3. *Efforts to Continually Increase Flood Protection for RD 17:* Local agencies plan to improve RD 17's levees to 200-year ULDC standards and beyond and are supporting restoration and improvement of the capacity of Paradise Cut to provide greater flood protection to downstream areas along the San Joaquin River including RD 17.
4. *Expanded rights-of-way along the landside toe of levees* are planned by RD 17 to accommodate uncertainties and future needs.
5. *Parks and open space set-asides.* RD 17 is pursuing and has in many cases secured a 50-foot setback with a single loaded street. The use of the setback area is open space or preferably a linear park.
6. *Conservation Easements.* Agreements between landowners and an agency (USFWS, etc) permanently preclude future development. San Joaquin County and the cities of Lathrop, Manteca, Stockton, Lodi, Escalon, Ripon, and Tracy have adopted the San Joaquin County Multi-Species Habitat and Conservation Plan. The SJMSCP has been approved by the U.S. Fish and Wildlife Service as a certified Habitat Conservation Plan (HCP). Habitat Conservation Plans (HCPs) provide a pathway forward to balance wildlife conservation with development. The primary objective of the HCP program is to conserve species and the ecosystems they depend on while streamlining permitting for economic development.

Provided for by the Endangered Species Act, "regional" HCPs (such as the SJMCP) are a successful conservation tool because they can anticipate, prevent, and resolve controversies and conflict associated with project-by-project permitting. They do this by addressing these issues on a large regional scale, collaboratively and over the long term.

The key purpose of the SJMSCP is to:

- Provide a strategy for balancing the need to conserve Open Space and the need to Convert Open Space to non-Open Space uses while protecting the region's agricultural economy.
- Preserve landowner property rights.
- Provide for the long-term management of plant, fish and wildlife species, especially those that are currently listed, or may be listed in the future, under the Federal Endangered Species Act (ESA) or the California Endangered Species Act (CESA).
- Provide and maintain multiple-use Open Space which contributes to the quality of life of the residents of San Joaquin County.
- Accommodate a growing population while minimizing costs to project proponents and society at large.

The *SJMSCP Planned Land Use Map* also identifies the boundaries for expected urban development and anticipated annexation areas and provides conservation strategies to offset the impacts of development. At the state and federal levels, the SJMSCP provides adequate compensation for and measures for avoiding impacts to plants, fish and wildlife for SJMSCP pursuant to the California Endangered Species Act (CESA), the California Native Plant Protection Act, the Federal Endangered Species Act (ESA), Section 404 of the Federal Clean Water Act (CWA), Section 10 of the Rivers and Harbors Act of 1899, and the Migratory Bird Treaty Act (MBTA) for listed SJMSCP Covered Bird Species also protected under the MBTA as these laws relate to the California Department of Fish and Game's (CDFG), United States Fish and Wildlife Service's (USFWS), and the U.S. Army Corps of Engineers' (USACE) responsibilities for Covered Species with respect to SJMSCP Permitted Activities located within the boundaries of San Joaquin County. Adoption and implementation of the SJMSCP by local planning jurisdictions provides adequate compensation for and minimization of impacts to plants, fish and wildlife for SJMSCP Permitted Activities as necessary to implement conservation and Open Space policies of local general plans, resolution, ordinances, and other regulations as they pertain to plants, fish and wildlife and as necessary to fulfill the obligations of local jurisdictions with respect to the analysis, minimization and mitigation of impacts to plants, fish and wildlife pursuant to the state and federal laws described above and pursuant to the California Environmental Quality Act (CEQA), and the National Environmental Policy Act (NEPA).

The SJMSCP is designed to provide 100,841 acres of Preserves based on an estimated Conversion acreage of 109,302 acres. The SJMSCP anticipates acquiring land primarily through conservation easements and fee title at a ratio of approximately 90% easements to 10% fee title acquisition. Establishment and/or use of mitigation banks, and in-lieu land dedications also will play a role in preserving habitats under the SJMSCP. The SJMSCP has over 30 preserves totally 11,883 acres of land in San Joaquin County that has been permanently protected for habitat pursuant to its program.

7. *Williamson Act agreements.* These rolling 10-year agreements between government and farmers preserve the agricultural and open space in rural California by offering landowners tax breaks on the assessed land value. There are currently 2,164 ac in Williamson Act agreements in San Joaquin County
8. *Agricultural preservation easements.* These easements keep land in agriculture in perpetuity, essentially removing development rights. San Joaquin County and the cities of Lathrop, Manteca, and Stockton have agricultural mitigation fee programs to support the work of accredited land trusts. Within RD-17, the City of Lathrop requires development to pay an agricultural preservation fee to the Central Valley Farmland Trust to offset its development impacts. The Central Valley Farmland Trust currently holds 33 agricultural conservation easements protecting nearly 13,000 acres in the San Joaquin, Sacramento, Stanislaus and Merced Counties. San Joaquin County and the City of Stockton have similar programs, and both agencies also use the Central Valley Farmlard Trust as its administrator. Stockton's program resulted in the preservation of 430 acres of prime farmland through the acquisition of conservation easements between 2007 and 2012, the initial five years of the program. During this time, the City collected almost $3 million in fees, which were transferred directly to the Trust to be used for the preservation of farmland. The County's program is very similar, but it requires that developers first attempt to acquire easements by demonstrating that a "good faith effort" was made before in-lieu fees are allowed to be paid. The County's program has been similarly successful in preserving prime farmland.
9. *Development impact fee and land purchase program.* A Development Impact Fee program is identified in the sponsor's local Finance Plan as an option to partially pay for the local share of the levee improvement program. This fee would be collected for any land developed in the benefit area, and would be dedicated to structural and non-structural flood risk reduction measures.
10. *FEMA CRS Rating.* San Joaquin County and the cities of Stockton, Lathrop, and Manteca are rated 6, 8, 8, and 9, respectively in the FEMA Community Rating System which rewards communities for advancing risk reduction programs. Ratings are on a scale of 1-10, with 1 representing the highest rating.
11. *Emergency response plan.* The San Joaquin County Office of Emergency Services coordinates emergency response planning and activities among the local

parties, and is considered one of the strongest programs in the state. It has been awarded a $1.6M grant to improve its interagency flood response planning and to increase the availability of flood fighting supplies to local levee maintaining agencies. As part of this effort, San Joaquin County recently completed Flood Safety Plans for the more than 100 miles of levees it maintains. These levees provide flood protection to much of the City of Stockton and the urbanized areas of unincorporated County in the Stockton area. Also, the County has implemented a flood alert system which provides real-time monitoring of water levels in many of the major streams and rivers that pose a flood threat to the Stockton metropolitan area. This system will be used as part of the decision-making process to deploy flood prevention and flood fighting efforts before and during major storm events.

12. *Annual flood risk notifications.* Annual flood risk notifications are mailed to all owners of levee-protected parcels by the State of California. Local agencies also communicate flood risk through a variety of regular mailings, meetings, websites and other methods. Additional public outreach on flood risk and preparedness is done in conjunction with local CRS programs.
13. *RD 17 Levee Seepage Repair Project.* RD 17 has completed Phases 1 and 2 of their levee strengthening program, and Phase 3 is expected to be under construction in 2015.

I. Development Restrictions

Various development restrictions are in place for land use authorities within the RD17 Basin at the local, state, and federal levels as summarized below. San Joaquin County and the Cities of Stockton, Lathrop, and Manteca are governed by land use related laws and regulations, many of which are designed to specifically limit the extent and intensity of growth.

Attachment Six

RECLAMATION DISTRICT NO. 17
235 East Weber Avenue (95202)
P. O. Box 1461
Stockton, California 95201
Telephone: (209) 465-5883
Facsimile: (209) 465-3956

October 27, 2014

San Joaquin Area Flood Control Agency
22 E. Weber Avenue, Suite 301
Stockton, California 95202

Attention: Roger Churchwell

Re: Lower San Joaquin River Feasibility Study
USACE Draft Plan Formulation

Dear Roger:

We object to the USACE Draft Plan Formulation and request that SJAFCA as our agent in the Lower San Joaquin River Feasibility Study also object. There are two major objections.

First. We object to the inclusion of any new levee or setback at the confluence of the San Joaquin River with Old River. At page 3-19 Alternative RD17-E includes a setback levee but no specific indication that it is the setback included in the EIR Phase III Seepage Repair Project. Additionally, the lineal footage and miles don't correlate. In the first paragraph of 3.2.5, it is stated that a small setback levee is included for potential floodplain restoration to aid in compliance with E011988 ecosystem/floodplain restorative goals. Our EIP project includes a small setback downstream of the confluence of the San Joaquin River at Old River but no setback at the confluence. This needs to be made clear in Alternative RD17-E on page 3-19 and in Alternative 9b on page 3-44 that the setback which is included is that which is in the current RD 17 EIP Phase III Seepage Repair Project.

Second. We object to the application of E.O. 11988 to any of the Alternatives for RD 17. E.O. 11988 should not be applied to Alternative 7b, 9b or any other alternative improving the existing RD 17 levees and the proposed tie back. It is now apparent that the USACE seeks through the application of E.O. 11988 to restore the natural floodplain along the San Joaquin River by rejecting otherwise feasible and cost effective projects to improve the project levees on Reclamation District No. 17.

At Page 3-57 Section 2, first paragraph, it is stated:

> "Due to the urbanization, there are few opportunities for restoration of the natural floodplain in the study area except for the reach of the mainstream San Joaquin River adjacent to RD 17."

In Section 2, third paragraph, it is stated:

> "Due to development on the landside of the levee system, there is little leeway for restoration of natural floodplain functionality and values other than in the RD 17 undeveloped area. This may mean that for a majority of the study area excluding RD 17, opportunities for floodplain restoration are foregone and enhancement of remaining floodplain and riparian habitat areas will be limited."

These statements are not only false but represent a deliberate attempt to mislead reviewers to preclude the objective review of the feasibility of flood control projects to protect the over 40,000 residents and billions of dollars of public and private property in RD 17. There are, of course, many miles of land along the San Joaquin River which do not abut urban development, some of which is directly across the river from RD 17. There are also numerous areas outside the leveed areas along Rd 17 as well as upstream and downstream which could be improved to provide additional habitat. There is also a significant opportunity to improve the floodplain values in connection with Paradise Cut which is a bypass reconstructed by the USACE but not performing as designed. Improvement of the habitat in portions of Paradise Cut is part of an ongoing development and additions are being considered by the State and locals.

UNLAWFUL ATTEMPT BY THE USACE TO USE A MISAPPLICATION OF E011988 TO CIRCUMVENT THE LAWS OF CONGRESS

In 1850 Congress adopted the Arkansas Act of 1850 sometimes referred to as the Swamp Land Act of 1850 to aid the States in reclaiming swamp and overflowed lands. By way of such Act, such lands were conveyed to the State of California in consideration of the duty of the State to make and maintain the necessary improvements for such reclamation. In the case of *Kimball v. Reclamation Fund Commissioners (1873) 45 Cal.344, 360* the California Supreme Court found:

> "The object of the Federal Government in making this munificent donation to the severed States was to promote the speedy reclamation of the lands and thus invite to them population and settlement, thereby opening new fields for industry and increasing the general prosperity." (Emphasis added.)

The area along the river for which the USACE seeks to cause the reversion to an unreclaimed flood plain consists of swamp and overflowed land conveyed in 1850 to the State for reclamation and development. Reclamation and development certainly commenced shortly after 1850. Reclamation District No. 17, one of the oldest reclamation districts in California was formed in 1863 and the levees along the San Joaquin River have been in place for more than 100 years. The land along the river is not undeveloped but consists of highly developed farmland, multiple residences and some commercial structures dating back to the 1800's.

The Lower San Joaquin River and Tributaries Project, of which the Lower San Joaquin River Levee Project is a unit, was authorized by the Flood Control Act of 22 December 1944, Public Law 534, 78th Congress, 2nd Session, Section 10. Included in the Project were the RD 17 levees along the left bank of French Camp Slough, those along the right back of the San Joaquin River and those along the right bank of Walthall Slough. Commencing in 1944, work on various portions of the RD 17 levees was carried out by the U.S. Army Corps of Engineers. The Standard Operation and Maintenance Manual for the Lower San Joaquin River Levees Project (prepared by the Sacramento District Corps of Engineers, U. S. Army, Sacramento, California, dated April, 1959) provides that the project includes construction or reconstruction of levees, channel improvement and the provision for bank protection along the Lower San Joaquin River from the mouth of the Merced River to the Delta, terminating at the Stockton Deep Water Ship Channel.

> "1.04. Protection Provided. The Lower San Joaquin River and Tributaries Project, including the levee and channel work of the Lower San Joaquin River Levees Project, when completed, will provide protection from all floods of record to about 120,000 acres of fertile agricultural lands; to a suburban area south of the City of Stockton and about four small communities; to other areas developed for residential and industrial purposes; to two transcontinental highway and other State and County highways. It will make possible the reclamation of areas that can be developed to a higher degree when protection against flood hazard is assured." (Emphasis added.)

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"1.03. Protection Provided. Levees along the left bank of French Camp Slough and right bank of San Joaquin River, as described in this unit, provide direct protection to about 12,000 acres of agricultural, industrial and residential lands within Reclamation District No. 17. Along French Camp Slough the grade of the adopted flood plane profile is level at elevation 11.0 from the San Joaquin River to the French Camp Turnpike. Along the right bank of the San Joaquin River, the grade of the adopted flood plane profile varies from elevation 11.0 at French Camp Slough to elevation 23.5 at Walthall Slough. All elevations are referred to mean seal level datum (1929) adjustment. Levee grades within this unit provide for a freeboard of at least 3 feet above the adopted flood plane profile. Within this unit, the project design flood for French Camp Slough is 3,000 cubic feet per second and for the San Joaquin River about 18,000 cubit feet per second from French Camp Slough to Old River and 37,000 cubic feet per second from Old River to Walthall. The flow in French Camp slough coincidental with the San Joaquin River design flood would be about 2,000 cubic feet per second." (Emphasis added.)

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The USACE actions to undo the reclamation of the RD 17 lands along the river is directly contrary to the clear intent and purpose of the Swampland Act of 1850 and the authorization and construction of the Lower San Joaquin River and Tributaries Project Unit No. 1 and Unit No. 2 which was to foster the very reclamation and development which the USACE is trying to reverse and obstruct.

Executive orders cannot change federal law. Congress has not changed the objectives of the Swampland Act of 1850 or the objectives of the Lower San Joaquin River and Tributaries Project.

Public and private investments have been made and thousands of people have located in RD 17 due to and in furtherance of the intent of Congress.

THE USACE CURRENT ACTIONS ARE INCONSISTENT WITH ITS PREVIOUS INTERPRETATION OF E.O. 11988 RELATING TO DEVELOPMENT IN RD 17

E.O. 11988 was adopted in about 1978.

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During the January 1997 floodfight, seepage and boils occurred at a number of locations along the RD 17 levees. The Corps, DWR and RD 17 actively and successfully addressed the seepage and boils. There were no failures in the RD 17 levees. Subsequently, the Corps, The Reclamation Board and RD 17 undertook a project to repair the seepage and boil areas along the RD 17 levees. The Corps designed and constructed the project. DWR reviewed the design. In October of 2004, the Corps notified The Reclamation Board

> "In October 2001, the U.S. Army Corps of Engineers (Corps) completed a portion of work for the Lower San Joaquin River and Tributaries Project, California. The features constructed under this contract included requirements associated with the rehabilitation of "Unit No. 2" along the right bank levee of San Joaquin River within Reclamation District (RD) No. 17. In order to ensure the work transferred meets the specific requirements of the project objectives as well as the requirements of the non-Federal sponsor, the Corps requests a review of the enclosed 'Addendum to Standard Operation and Maintenance Manual, Lower San Joaquin River and Tributaries Project, California, Unit No. 2, Right Bank Levee of the San Joaquin River and Left Bank of French Camp Slough Within Reclamation District No. 17'."

The Addendum reflects that the State of California Reclamation Board officially accepted responsibility for operating and maintaining the construction completed in 2001 under Contract No. DACW05-00-C-0033 through a letter dated July 18, 2003.

No objection based on E.O. 11988 was raised by the USACE until the present. E.O. 11988 does not appear to have been changed by the President and it is the USACE that is unilaterally changing the interpretation of the Executive Order so as to conflict with federal law. Such action would appear to be both arbitrary and contrary to law.

The current project being considered for RD 17 is not a new project such that natural or undeveloped floodplain would be impacted but in reality is simply an improvement of the Lower San Joaquin River and Tributaries Project which was intended to protect against the highest flood of record.

THE USACE'S FAILURE TO DESIGN AND CONSTRUCT THE RD 17 LEVEES TO CONFORM TO ITS OWN SEEPAGE REQUIREMENTS IS NOW BEING CITED AS THE BASIS FOR THE OBSTRUCTION TO IMPROVEMENT OF RD 17 LEVEES AND JUSTIFICATION FOR SEEKING TO UNDO THE RECLAMATION OF RD 17 LANDS IN VIOLATION OF FEDERAL LAW

At page 3-54 of the Plan, it is stated:

> "For the purpose of this analysis and the current study, Sacramento District has defined the base floodplain using the risk and uncertainty assurance values for the existing levees. Current levee conditions result in assurance values less than 90% for the one percent chance event due to underseepage issues, so the District has delineated the base floodplain assuming the levees were not in place. This results in the entirety of the study area falling within the base floodplain and subject to compliance with E.O. 11988. From the Federal Emergency Management Agency perspective, if levees meet 90 to 95% assurance or higher and are accredited, the base floodplain ends at the landside toe of the levee, and the area behind the levee is assigned a Zone X designation under the National Flood Insurance Program (NFIP). FEMA did not use the Corps' risk and uncertainty assurance values when accrediting RD 17 levees."

Of course, FEMA did not use the Corps' risk and uncertainty assurance values when accrediting RD 17 levees as such were not part of the criteria for accreditation.

The Corps designed and constructed the project levee improvements to the RD 17 levees during the period of 1944-1963. They apparently did not "provide protection from all floods of record "and the very claimed deficiencies which are cited by the Corps are due to their failures in design and construction." The levees along the San Joaquin River are in the same location as when improvements to project standards were completed by 1963 and they have been substantially improved.

After the 1997 high water event, the Corps carried out a project together with the State and RD 17 to repair the seepage and boil areas along the RD 17 levees. RD 17 successfully and with great effort conducted an assessment ballot proceeding to raise the money for its local share.

The Corps designed and constructed the project including all measures to address the seepage and boils. The Addendum to the Operation and Maintenance Manual prepared by the Corps provides:

> "2-05. Berms.
>
> a. Description. The berms construction in 2001 under Contract No. DACW05-00-C-0033 are located along the landside slope of the existing levee. This construction contract included the installation of a berm at 21 separate sites between L.M. 0.98 and L.M. 13.08 of Unit No. 2. A berm is generally constructed to satisfy one or both of the following objectives: 1) Stability - Compacted fill is placed along the toe and slope of the levee as a buttress to stabilize the levee against sloughing or rotational slipping; or, 2) Seepage - Fill is placed over a layer of pervious drainage material or other drainage feature as a counterweight to uplift pressures associated with heavy seepage or boils. The height, width, cross-slope, and side-slope of each berm varies based on which objective it has been designed to satisfy. For information specific to any one of the berms constructed in 2001, refer to the attached Project Information Form, EXHIBIT A-2, or the As-Built Drawings, EXHIBIT B. In general, all berms should be operated in maintained in accordance with the principles that govern the operation and maintenance of a levee.
>
> b. For pertinent Requirements of the Code of Federal Regulations and other requirements, see the following:
>
> (1) Sand Boils paragraph 8-09 of the standard Manual.
>
> (2) Sub-levees or Bow Levees paragraph 8-10 of the Standard Manual."

(emphasis added)

Subsequent to 2001 substantial development has taken place within RD 17 and in the City of Lathrop developers have been required to install toe drains landward of the levee to intercept seepage. All work on the RD 17 levees since the Corps Project Levee Construction in 1963 including the improvements to meet FEMA accreditation requirements in 1990 has increased the ability of the levee system to address seepage and boil concerns.

The criteria presently used by the Corps to justify its unlawful attempt to reverse the reclamation of the RD 17 lands along the San Joaquin River was not used by the Corps in the construction of the project levees and not even used in the project to repair the seepage and boils which was completed in 2001.

The Corps' misguided use of its underseepage analysis to support its floodplain argument also ignores the EIP seepage repair project which is now being carried out by DWR and RD 17. Funding is in place to complete the project and any consideration of seepage should account for such project.

THE STATE AGREEMENT TO SERVE AS THE NON-FEDERAL SPONSOR OF AND THE RD 17 AGREEMENT WITH THE STATE TO OPERATE AND MAINTAIN THE PROJECT LEVEES WERE BASED UPON THE CLEAR INTENT AND PURPOSE AS EXPRESSED IN THE SWAMPLAND ACT OF 1850 AND THE LOWER SAN JOAQUIN RIVER AND TRIBUTARIES PROJECT TO PERPETUALLY OPERATE AND MAINTAIN THE PROJECT LEVEES TO FOSTER DEVELOPMENT AND THE ECONOMY.

The actions of the USACE constitute a unilateral interference with the contracts and intentions of the State, RD 17 and the United States.

The safety of thousands of people, their livelihoods and homes and billions of dollars of public and private investment are being jeopardized by the arbitrary, capricious and unlawful actions of the Corps.

THE USACE ACTIONS ARE AN UNFAIR AFTER-THE-FACT ATTEMPT TO CHANGE LAND USE PLANS WHICH WERE BASED ON FEMA ACCREDITATION AND CORPS APPROVAL IN 1990.

The General Plans of the land use agencies have been in place for a number of years and are not being induced by reason of the feasibility study projects. Even the State SB-5 requirements to provide a 200-year level of protection for residential and some other types of developments do not require the reversal of the reclamation of the RD 17 lands.

Changes in engineering analysis and creation of loosely defined rules of risk and uncertainty should not be used as a basis for total disruption and probable destruction of major communities by after-the-fact determinations.

The solution is to upgrade the levees to provide the additional desired protection.

THE RISK AND UNCERTAINTY ANALYSIS BY THE CORPS DOES NOT APPEAR TO ADEQUATELY ACCOUNT FOR THE HEALTH AND SAFETY OR IMPACT ON THE CAPABILITY OF COMMUNITIES TO REMAIN VIABLE.

The risk and uncertainty analysis for RD 17 should not be approved. The methods and application must be carefully reviewed by the local technical representatives. The result of leaving 40,000 plus people and billions of dollars of public and private investment including two major highways, the County Hospital and Jail and multiple schools inadequately protected is unjustifiable.

CONCLUSION

We respectfully request that the Draft Plan Formulation be rejected.

Yours very truly,

DANTE JOHN NOMELLINI
Secretary and Counsel

DJN:ju

RECLAMATION DISTRICT NO. 17
235 East Weber Avenue (95202)
P. O. Box 1461
Stockton, California 95201
Telephone: (209) 465-5883
Facsimile: (209) 465-3956

April 8, 2015

Via Email: tyler.m.stalker@usace.army.mil

Tyler Stalker
U.S. Army Corps, Corps of Engineers
1325 J Street, Rm. 1513
Sacramento, CA 95814

Re: Lower San Joaquin River, CA Draft Feasibility Report / Environment Impact Statement / Environment Impact Report - February 2015

Dear Mr. Stalker:

Reclamation District No. 17 which was founded in 1863 operates and maintains about 19 miles of levee extending along the right bank of the San Joaquin River, the left bank of French Camp Slough and the right bank of Walthal Slough. Of the 19 miles, 16.18 miles are project levees for which construction was completed by the USACE in about 1963.

Denial of Improved Flood Protection to 43,600 Residents and Billions of Dollars of Public and Private Investment is Unjust and Unlawful and will Increase the Risk of Loss of Human Life and Personal Health and Safety.

Your determination that there is no federal interest in providing needed flood protection for the 43,600 residents, two major highways, two major railroads, County hospital, County sheriff and jail complex, children center, multiple schools, police and fire facilities, City Hall and other public and private improvements, etc. is unjust and unlawful. Your analysis does not comply with your own guidelines and is predecisional in the NEPA process. (See DEIS/EIR pages 3-64 to 3-67 which are attached). Your actions interfere with the contractual relations as to operational maintenance of the project levees and the Corps responsibility to correct deficiencies in the design and construction related thereto.

Your actions have wrongfully created a stigma on the communities within RD 17 and create a physical division in our community between those areas which will be provided with increased flood protection and those which will not.

The prejudice and risk created by your discriminatory treatment of the areas within RD 17 will diminish the value of the homes of 43,600 residents and the other public and private investments. Future public and private investments and the economic survival of the area will be jeopardized.

Two of the highest disadvantaged census tracts in the State of California are located within RD 17 and will be unjustly impacted by your action (Attached are Disadvantaged Community Maps and information for census tracts 6077003803 and 6077005119).

The Area protected by the RD 17 Levees is not Flood Plain. The Area was Fully Reclaimed from the Natural Flood Plain Prior to 1863.

The area although at some level of risk of flooding has levees which have been substantially and continually improved. The USACE completed the project levee improvements in about 1963 and additional privately funded improvements were completed by 1990 to meet FEMA standards. The flood protection has since 1990 met the FEMA requirements for urban development.

In 1850 Congress adopted the Arkansas Act of 1850 sometimes referred to as the Swamp Land Act of 1850 to aid the States in reclaiming swamp and overflowed lands. By way of such Act, such lands were conveyed to the State of California in consideration of the duty of the State to make and maintain the necessary improvements for such reclamation. In the case of *Kimball v. Reclamation Fund Commissioners (1873) 45 Cal.344, 360* the California Supreme Court found:

> "The object of the Federal Government in making this munificent donation to the several States was to promote the speedy reclamation of the lands and thus invite to them population and settlement, thereby opening new fields for industry and increasing the general prosperity." (Emphasis added.)

The area along the river for which the USACE seeks to treat as an unreclaimed flood plain consists of swamp and overflowed land conveyed in 1850 to the State for reclamation and development. Reclamation and development certainly commenced shortly after 1850. Reclamation District No. 17, one of the oldest reclamation districts in California was formed in 1863 and the levees along the San Joaquin River have been in place for more than 100 years.

The land along the river is not undeveloped but consists of highly developed farmland, multiple residences and some commercial structures dating back to the 1800's.

The Lower San Joaquin River and Tributaries Project, of which the Lower San Joaquin River Levee Project is a unit, was authorized by the Flood Control Act of 22 December 1944, Public Law 534, 78th Congress, 2nd Session, Section 10. Included in the Project were the RD 17 levees along the left bank of French Camp Slough, those along the right bank of the San Joaquin River and those along the right bank of Walthall Slough. Commencing in 1944, work on various portions of the RD 17 levees was carried out by the U.S. Army Corps of Engineers. The Standard Operation and Maintenance Manual for the Lower San Joaquin River Levees Project (prepared by the Sacramento District Corps of Engineers, U. S. Army, Sacramento, California, dated April, 1959) provides that the project includes construction or reconstruction of levees, channel improvement and the provision for bank protection along the Lower San Joaquin River from the mouth of the Merced River to the Delta, terminating at the Stockton Deep Water Ship Channel.

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Public and private investments have been made and thousands of people have located in RD 17 due to and in furtherance of the intent of Congress.

THE USACE CURRENT ACTIONS ARE INCONSISTENT WITH ITS PREVIOUS INTERPRETATION OF E.O. 11988 RELATING TO DEVELOPMENT IN RD 17

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During the January 1997 high water event, seepage and boils occurred at a number of locations along the RD 17 levees. The Corps, DWR and RD 17 actively and successfully addressed the seepage and boils. There were no failures in the RD 17 levees. Subsequently, the Corps, The Reclamation Board and RD 17 undertook a project to repair the seepage and boil areas along the RD 17 levees. The Corps designed and constructed the project. DWR reviewed the design. In October of 2004, the Corps notified The Reclamation Board

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The current feasibility study alternatives for RD 17 would not be a new project such that natural or undeveloped flood plain would be impacted but in reality would simply be an improvement of the 1944 Lower San Joaquin River and Tributaries Project which was intended to protect against the highest flood of record and foster development.

THE USACE'S FAILURE TO DESIGN AND CONSTRUCT THE RD 17 LEVEES TO CONFORM TO ITS OWN SEEPAGE REQUIREMENTS IS THE BASIS FOR THE CORPS DETERMINATION THAT RD 17 IS IN THE BASE FLOOD PLAIN AND THE REJECTION OF FEDERAL ASSISTANCE FOR IMPROVEMENT OF RD 17 LEVEES

At page 3-53 of the DEIS/EIR, it is stated:

The overall purpose of the project is to reduce flood risk to urban and urbanizing parts of the study area. The final array of alternatives involve improving levees or constructing new levees located in the base 1% (1/100) annual chance exceedance (ACE) flood plain. For the purpose of this study, the base flood plain is delineated as all areas that are at risk of being flooded by the 1/100 ACE flow. In other words, the base flood plain has been delineated assuming existing levees do not provide protection from the 1/100 ACE event. This is because this definition of the base flood plain addresses the USACE requirement in Engineer Regulation 1105-2-101 to describe a project's performance using risk and uncertainty methods and for purposes of studies 1105-2-101 does not require USACE to give deference to the current accreditation for RD17's levee system provided by the Federal Emergency Management Agency in 2011. For this reason, the entire study area was evaluated for E.O. 11988 compliance.

The bases for the Corp's determination that RD 17 is within the base flood plain are seepage concerns which were not addressed by the Corps in construction of the project levees completed in 1963 and not addressed in the seepage repairs completed in 2001.

The Corps designed and constructed the project levee improvements to the RD 17 levees during the period of 1944-1963. They apparently did not "provide protection from all floods of record "and the very claimed deficiencies which are cited by the Corps are due to their failures in design and construction." The levees along the San Joaquin River are in the same location as when improvements to project standards were completed by 1963 and they have been substantially improved.

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a. Description. The berms construction in 2001 under Contract No. DACW05-00-C-0033 are located along the landside slope of the existing levee.

This construction contract included the installation of a berm at 21 separate sites between L.M. 0.98 and L.M. 13.08 of Unit No. 2. A berm is generally constructed to satisfy one or both of the following objectives: 1) Stability - Compacted fill is placed along the toe and slope of the levee as a buttress to stabilize the levee against sloughing or rotational slipping; or, 2) Seepage - Fill is placed over a layer of pervious drainage material or other drainage feature as a counterweight to uplift pressures associated with heavy seepage or boils. The height, width, cross-slope, and side-slope of each berm varies based on which objective it has been designed to satisfy. For information specific to any one of the berms constructed in 2001, refer to the attached Project Information Form, EXHIBIT A-2, or the As-Built Drawings, EXHIBIT B. In general, all berms should be operated and maintained in accordance with the principles that govern the operation and maintenance of a levee.

b. For pertinent Requirements of the Code of Federal Regulations and other requirements, see the following:

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(2) Sub-levees or Bow Levees paragraph 8-10 of the Standard Manual."

(emphasis added)

Subsequent to 2001 substantial development has taken place within RD 17 and in the City of Lathrop developers have been required to install toe drains landward of the levee to intercept seepage. All work on the RD 17 levees since the Corps Project Levee Construction in 1963 including the improvements to meet FEMA accreditation requirements in 1990 has increased the ability of the levee system to address seepage and boil concerns.

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AS EXPRESSED IN THE SWAMPLAND ACT OF 1850 AND THE LOWER SAN JOAQUIN RIVER AND TRIBUTARIES PROJECT TO PERPETUALLY OPERATE AND MAINTAIN THE PROJECT LEVEES TO FOSTER DEVELOPMENT AND THE ECONOMY.

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The safety of thousands of people, their livelihoods and homes and billions of dollars of public and private investment are being jeopardized by the arbitrary, capricious and unlawful actions of the Corps.

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The General Plans of the land use agencies have been in place for a number of years and are not being induced by reason of the feasibility study projects. Even the State SB-5 requirements to provide a 200-year level of protection for residential and some other types of developments do not require the reversal of the reclamation of the RD 17 lands.

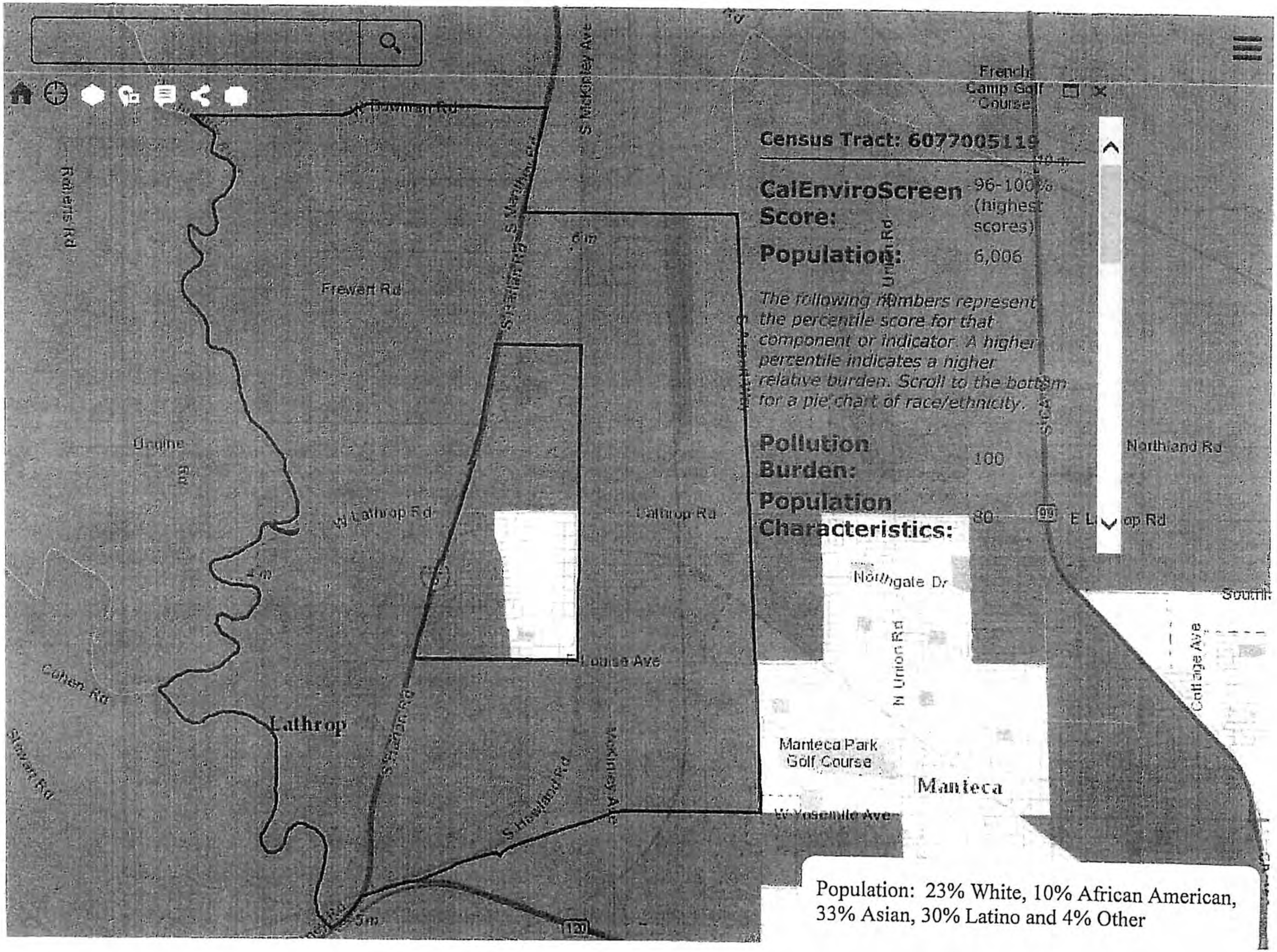
Changes in engineering analysis and creation of loosely defined rules of risk and uncertainty should not be used as a basis for total disruption and probable destruction of major communities by after-the-fact determinations.

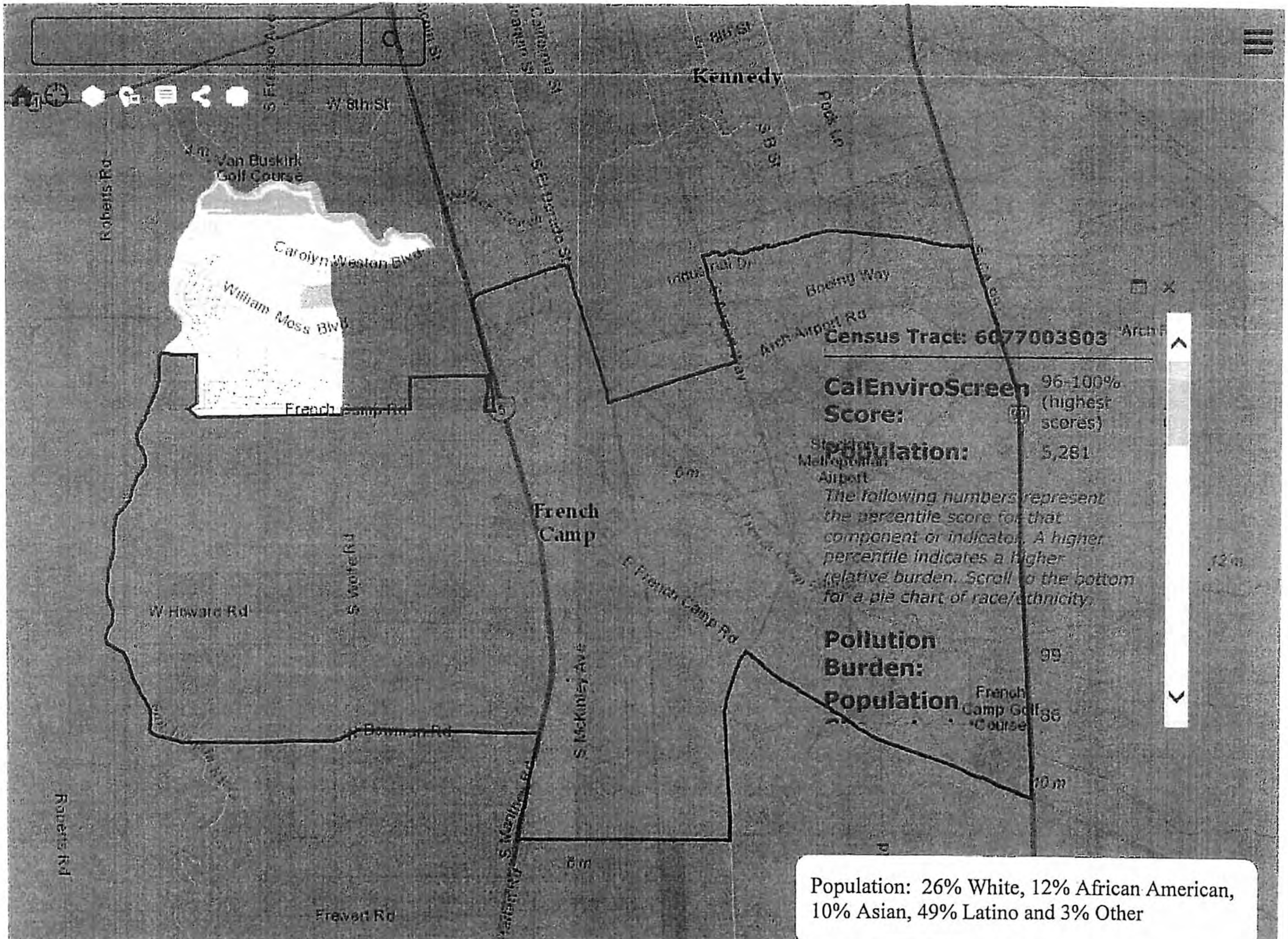
We request that the RD17 alternatives without the setback along the San Joaquin River be included for complete analysis in the current feasibility study and that reanalysis be conducted impartially and in compliance with law.

Yours very truly,

Dante John Nomellini
Reclamation District No. 17

This is part one of our comments. Part two will be submitted by the April 13, 2015 deadline.


Census Tract: 6077005119
CalEnviroScreen Score: 96-100% (highest scores)
Population: 6,006
The following numbers represent the percentile score for that component or indicator. A higher percentile indicates a higher relative burden. Scroll to the bottom for a pie chart of race/ethnicity.
Pollution Burden: 100
Population Characteristics: 80
French Camp Golf Course
Frewert Rd
Lathrop Rd
Louise Ave
Lathrop
Manteca Park Golf Course
Manteca
Northgate Dr
N Union Rd
Northland Rd
Cottage Ave
W Yosemite Ave
S Howland Rd
McKinley Ave
S McKinley Ave
Cohen Rd
Stewart Rd
Population: 23% White, 10% African American, 33% Asian, 30% Latino and 4% Other


W 8th St
Van Buskirk Golf Course
Carolyn Weston Blvd
William Moss Blvd
French Camp Rd
Roberts Rd
Kennedy
S B St
Pock Ln
Boeing Way
Arch Airport Rd
French Camp
E French Camp Rd
S McKinley Ave
W Howard Rd
S Wolfe Rd
Frewert Rd
Census Tract: 6077003803
CalEnviroScreen Score:
96-100% (highest scores)
Population:
5,281
The following numbers represent the percentile score for that component or indicator. A higher percentile indicates a higher relative burden. Scroll to the bottom for a pie chart of race/ethnicity.
Pollution Burden:
99
Population
86
Population: 26% White, 12% African American, 10% Asian, 49% Latino and 3% Other

6. As part of the planning process under the Principles and Guidelines, determine viable methods to minimize any adverse impact of the action including any likely induced development for which there is no practicable alternative and methods to restore and preserve the natural and beneficial flood plain values. This should include reevaluation of the "no action" alternative.

As discussed, the historic placement of levees in the study area precludes opportunities for restoration or enhancement of natural flood plain values.

Evaluation of the alternatives which included RD 17 with respect to development and minimization of adverse impacts caused USACE to reevaluate the final array of alternatives. Based on existing land use planning further inducing development in RD 17 in the deepest parts of the flood plain (highest life-safety consequence), the decision was made to remove the RD 17 alternatives from further consideration in this draft feasibility study (Alternatives 7b, 8b, and 9b). The Principles and Guidelines state that Federal investments in water resources should avoid the unwise use of flood plains and flood-prone areas and minimize adverse impacts and vulnerabilities in any case in which a flood plain or flood-prone area must be used. While few practicable alternatives to development in the flood plain were identified, it was determined that the proposed development, as shown in the General Plans, is unwise from the perspective of supporting Federal investment for a flood risk reduction project.

7. If the final determination is made that no practicable alternative exists to locating the action in the flood plain, advise the general public in the affected area of the findings.

The public will have an opportunity to comment on this analysis and determination when the Draft Integrated Feasibility Report/EIS/EIR is released for concurrent public, resource agency, independent external peer and USACE technical, policy and legal reviews.

8. Recommend the plan most responsive to the planning objectives established by the study and consistent with the requirements of the Executive Order.

Existing Project levees were historically placed in close proximity to the river channels, reducing the extent of natural flood plain within the study area. Existing infrastructure, such as transportation routes, housing, agricultural improvements, levees and drains, limits the potential for restoration of the San Joaquin River natural hydrology and ecosystem functions. The North and Central Stockton alternatives have little or no unmitigated adverse effects due to the fully developed nature of the North and Central Stockton areas. The proposed placement of development within the RD 17 basin is in the deepest part of the flood plain (highest life-safety consequence).

The RD 17 alternatives are removed from consideration based on the Principles and Guidelines which state that Federal investments in water resources should avoid the unwise use of flood plains and flood-prone areas and minimize adverse impacts and vulnerabilities in any case in which a flood plain or flood-prone area must be used. The remaining alternatives (Alternatives 7a, 8a, and 9a) have little or no unmitigated adverse effects due to the fully developed nature of the North and Central Stockton areas.

Critical Actions. Repeat steps 1 through 8 above for critical actions in the critical action flood plain for the full range of potential residual flood risks. The critical action flood plain is defined as the 500-year flood plain (0.2 percent chance flood plain).

1. Determine if the proposed action is in the critical action flood plain.

The critical action flood plain (500-year flood plain) consists of the entire study area delineated in Figure 1-3. Proposed actions being analyzed by this study are within the critical action flood plain.

2. If the action is in the critical action flood plain, identify and evaluate practicable alternatives to the action or to location of the action in the base flood plain.

There are no practicable alternatives to the proposed actions being situated within the critical action flood plain. See Base Flood Plain Step 2.

3. If the action must be in the critical action flood plain, advise the general public in the affected area and obtain their views and comments.

See Base Flood Plain Step 3.

4. Identify beneficial and adverse impacts due to the action and any expected losses of natural and beneficial flood plain values. Where actions proposed to be located outside the 0.2% flood plain will affect the 0.2% flood plain, impacts resulting from these actions should also be identified.

The critical infrastructure currently located in the critical action flood plain includes 2 major inter-state and international highways (I-5, CSR-99), 4 hospitals, 9 fire stations, 8 police stations, 3 railroads, wastewater treatment plant, and an airport and currently consists of the developed portions of the Cities of Stockton, Lathrop and Manteca. There are no liquefied natural gas terminals and facilities producing and storing highly volatile, toxic or water-reactive materials in the study area. Current population at risk is approximately 235,047 within the 0.2% ACE (500-year) natural flood plain and economic damages as defined by damageable property amount to $21 billion. Without project expected annual damages range from $150 - $250 million. If flooded, an added dimension to the disaster would be a possible wastewater treatment plant containment failure which would impact water quality in the Delta and could interrupt water deliveries to the communities in the southern valley and to Southern California.

Beneficial impacts due to the action would include risk management to the current critical infrastructure within the study area. Adverse impacts due to the action include the possibility for additional critical infrastructure being located within the RD 17 basin, potentially in the deepest areas of flooding, thereby increasing to the critical infrastructure already in place.

See Base Flood Plain Step 4 above for the expected losses of natural and beneficial flood plain values discussion.

5. If the action is likely to induce development in the critical action flood plain, determine if a practicable non-flood plain alternative for the development exists.

There may be opportunities to locate some future critical facilities outside the critical action flood plain. However, facilities such as schools and fire stations must be placed within close proximity to any future development. Therefore, if development occurs as shown in Figure 3-20, there will be no practicable non-critical action flood plain alternative for these critical facilities.

6. As part of the planning process under the Principles and Guidelines, determine viable methods to minimize any adverse impact of the action including any likely induced development for which there is no practicable alternative and methods to restore and preserve the natural and beneficial flood plain values. This should include reevaluation of the "no action" alternative.

See Base Flood Plain Step 6.

7. If the final determination is made that no practicable alternative exists to locating the action in the flood plain, advise the general public in the affected area of the findings.

See Base Flood Plain Step 7.

8. Recommend the plan most responsive to the planning objectives established by the study and consistent with the requirements of the Executive Order.

As a result of the analysis required for compliance with E.O. 11988, USACE has made a determination that alternatives 7a, 8a, and 9a have little or no unmitigated adverse effects to flood plain areas and are therefore compliant with EO 11988.

3.6.2 Result of Executive Order 11988 Analysis

As a result of the analysis required for compliance with E.O. 11988 as discussed above, the RD 17 alternatives were removed from further consideration in this draft feasibility study. This action results in a policy compliant array of the following alternatives for identification of the NED and TSP plans: Alternative 7a, Alternative 8a, and Alternative 9a.

It is understood that RD 17, with funding assistance from the State, is currently pursuing a phased strategy of levee improvements to initially increase the resistance of RD 17's levee system to under seepage and through seepage. Upon completion of that work, RD 17 and the non-Federal sponsors intend to pursue USACE participation in additional studies/improvements necessary to achieve the non-Federal objective of 200-year (0.5 percent ACE) flood risk management in order to meet SB 5 requirements. Consideration of future Federal participation would be subject to demonstration of a Federal interest in such incremental improvements.

3.7 Environmental Considerations and Mitigation

All appropriate environmental resources were analyzed during development of the proposed alternatives to fully comply with NEPA and CEQA. Most impacts to resources as a result of implementation of a proposed project can be mitigated, but there are challenges related to impacts to riparian habitats within the study area.

3.7.1 Regional Context

Riparian habitats are substantially reduced from their historical extents throughout the Central Valley. Only about 2-5 percent of the historic riparian habitat still exists (RHJV 2004). This is true along the San Joaquin River as well. Establishment of the FRM system, with levees set immediately adjacent to the main rivers and tributaries contributed to this decline and continues to result in conflicts between ecosystem health and sustainability and maintenance of the FRM system. Upstream of the proposed project area, considerable Federal and state investment has been made to improve the riparian corridor as part of the San Joaquin River Restoration Program and the Federal and state refuge systems.

In general, riparian communities are among the richest community types, in terms of structural and biotic diversity, of any plant community found in California. Riparian vegetation provides important ecological functions, including: wildlife habitat; migratory corridors for wildlife; pollution filtration and waterway shading, thereby improving water quality; provides connectivity between waterways and nearby uplands; and biomass (nutrients, insects, large woody debris, etc.) to adjacent waterways. Riparian forests and woodlands – even remnant patches – are important to resident and migratory fish, birds, and other wildlife.

3.7.2 Study Area

The riparian corridor in the study area is severely constrained by the proximity of the flood management levees to the rivers, tributaries and sloughs. Throughout most of the corridor vegetation is highly altered and fragmented. Nevertheless, this vegetation is all that remains as habitat to resident and migratory fish and wildlife in the proposed

Attachment Two

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April 13, 2015

VIA E-MAIL -
VIA FEDEX

Ms. Tanis Toland
U.S. Army Corps of Engineers
1325 J Street
Room 1513
Sacramento, CA 95814-2922

Re: Lower San Joaquin River Basin Integrated Interim Feasibility Report and Draft Environmental Impact Statement/Environmental Impact Report

Dear Ms. Toland:

Thank you for the opportunity to submit comments on behalf of our client, Reclamation District 17 ("RD 17"), regarding the Lower San Joaquin River Basin Lower San Joaquin River, CA Draft Integrated Interim Feasibility Report/Environmental Impact Statement/Environmental Impact Report ("Draft FR/EIS/EIR").

On numerous occasions during the plan formulation process, we advised the San Joaquin Area Flood Control Agency (SJAFCA) and the U.S. Army Corps of Engineers (USACE) of our concerns regarding the USACE's proposal to exclude the RD 17 levees from the USACE's Lower San Joaquin River Basin flood control project. (See Exhibit 1 *SJAFCA 2/5/15 Letter*). Our concerns fell on deaf ears.

We reviewed the Draft FR/EIS/EIR with a specific focus on the plan formulation process and the alternatives that the USACE and SJAFCA evaluated for flood management in the Lower San Joaquin River study area. As a major participant in the Local Sponsor Group, and a sponsor of significant funding for the Draft FR/EIS/EIR, RD 17 objects to the USACE's premature and unlawful decision to remove from consideration flood risk reduction alternatives for RD 17 in the Draft FR/EIS/EIR. Our review suggests that the draft documents provide clear and convincing evidence that the USACE already made up its mind to reject the RD 17 levees from consideration *before* the USACE and SJAFCA completed the Feasibility Report and the environmental review process under the National Environmental Policy Act (42 U.S.C. 4321 *et seq.*) ("NEPA") and the California Environmental Quality Act (Pub. Res. Code 21000 *et seq.*) ("CEQA"), and long before the public had an opportunity to offer its comments on the alternatives under consideration.

As stated on Draft FR/EIS/EIR page ES-12, the USACE selected Alternative 7a – North and Central Stockton alternatives excluding RD 17 as the Tentatively Selected Plan (the "TSP"). The USACE's arbitrary and unlawful process for selecting Alternative 7a as the TSP for the Lower San Joaquin River Basin flood management plan as set forth in the FR/EIS/EIR is pre-decisional and deprived the public of a meaningful opportunity to review and comment on the practicable alternatives for flood management in the Lower San Joaquin River Basin. Yes, the USACE advised the public that it could comment on the draft documents, but unfortunately, it is too late; the USACE already recommended Alternative 7a as the TSP. To remedy the defects reflected in the FR/EIS/EIR, RD 17 requests that the USACE (1) analyze and consider the RD 17 alternatives (Alternatives 7b, 8b, and 9b) in this Feasibility Report at a level of detail commensurate with the level of analysis the USACE afforded Alternative 7a (the "Tentatively Selected Plan"), and add an analysis of the RD 17 preferred plan which consists of improvements to the RD 17 levees without the secondary levee along the San Joaquin River ("RD 17 Preferred Plan").

Overview of Reclamation District 17 and the Federal Interest

Reclamation District 17 was founded in 1863, and operates and maintains approximately 19 miles of levees within the Lower San Joaquin River Basin. The Lower San Joaquin River study area is located along the lower (northern) portion of the San Joaquin River system in the Central Valley of California. RD 17 is located just south of the confluence of French Camp Slough and the San Joaquin River, in the lower third of the Lower San Joaquin River Delta. RD 17 is defined by the levees extending along the right bank of the San Joaquin River, the left bank of French Camp Slough and the right bank of Walthal Slough. A dry-land levee is situated at the upstream end of the reclamation district (see Draft FR/EIS/EIR Economic Appendix, Appendix C – November 2014, page 13). Of the 19 miles of levees, 16.18 miles are Federal project levees for which the USACE completed construction in 1963 – over 50 years ago.

RD 17 is charged with the management and operation of existing Federal project levees which protect the Cities of Lathrop and Manteca and a portion of Stockton. As explained on page 1-20 of the Draft FR/EIS/EIR, improving the lower reaches of the San Joaquin River and Tributaries was authorized by the Flood Control Act of 1944 (Public Law 532, December 22, 1944, 78th Congress, 2nd Session), as modified by Public Law 327, 84th Congress, 1st Session (see also, Appendix C, Economic Appendix – November, 2014 at p. lxxiv). The San Joaquin River and Tributaries Project provided for the Federal Government to improve the levee system on the San Joaquin River from the Delta upstream to the Merced River, by raising and strengthening existing levees and revetment of river banks where required. The local interest plan of improvement was coordinated with the Federal Government's plan to provide for the maintenance and operation of the levees. After the Federal Government completed its project, the levees were turned over to the State and the reclamation districts for maintenance and operation in accordance with the Secretary of the Army's requirements (see FR/EIS/EIR at p. 1-20). Thus, since 1963, the USACE's Federal project system has protected the Lower San

Joaquin River Basin, and specifically, the RD 17 geographic area, and the Federal Government has retained a Federal interest in the Federal Project system.

RD 17 has maintained and operated the Federal Project levees in accordance with the Secretary of the Army's Operations and Maintenance Manual and Supplemental Manual for over 50 years. Further, since 1990, RD 17 has undertaken repairs to the levees to continue to maintain 100-year flood protection. At no time has the Federal Government informed RD 17 that Congress has de-authorized the Federal Project levees protecting RD 17, or otherwise revoked its decision to flood protect the area. Thus, the Federal interest in RD 17 has already been made, and the USACE cannot change its mind 50 years later and refuse to acknowledge the Federal investment made in the area.

The FR/EIS/EIR Fails to Adequately Analyze and Consider the RD 17 Alternatives, including the RD 17 Preferred Plan, and the FR/EIS/EIR Must be Revised.

The USACE and its non-Federal sponsors, SJAFCA, and the State of California Central Valley Flood Protection Board, propose to improve flood risk management in the Lower San Joaquin River Basin. The USACE and its non-Federal sponsors prepared the FR/EIS/EIR and purported to follow the Federal planning process for the development of water resource projects in order to identify the TSP to recommend to Congress for authorization (see e.g., FR/EIS/ EIR, Chapter 8).

The overall purpose of the proposed flood management project is to reduce flood risk to urban and urbanizing parts of the *Study Area* as explained in Chapter 3 of the FR/ EIS/EIR. The USACE, however, selected an agency preferred alternative that only protects *part of* the Study Area and completely excludes RD 17. During the Feasibility Report process, the USACE identified its preferred alternative (Alternative 7a) which was limited by the USACE's decision to remove from consideration the RD 17 Alternatives (Alternatives 7b, 8b, and 9b). Alternative 7a is the National Economic Development (NED) Plan, and it serves to set the level of Federal participation in a project resulting from the Feasibility Report. In the interest of time, the USACE proceeded with Alternative 7a as the TSP and removed from further consideration any improvements to RD 17 on the basis that the USACE must avoid the unwise use of floodplains and flood-prone areas (see Draft FR/EIS/EIR, p. 3-64). Consequently, the USACE decided it had no choice but to select Alternative 7a as the TSP. Even though the Federal investment has been made for a flood risk project to protect RD 17 since 1958, the USACE decided now in 2015 that it was "unwise" for the local communities to have ever made land use decisions based on that Federal investment (see Draft FR/EIS/EIR, p. 3-64).

The USACE's decision to remove from consideration any improvements to the RD 17 levees conflicts with Congress' prior authorizations to flood protect the area. While Alternative 7a provides flood risk management for North and Central Stockton, Alternative 7a does not meet the non-Federal sponsor's objectives of flood risk management and SB 5 compliance for RD 17 and the Cities of Lathrop and Manteca and a portion of Stockton as required as a matter of State law because Alternative 7a excludes any flood control improvements and flood management for

RD 17 and the Cities of Lathrop and Manteca and a portion of Stockton. The Draft FR/EIS/EIR evaluates the RD 17 Alternatives at a very general level of analysis, and, despite requests from RD 17 and SJAFCA, the document did not include *any* information and analysis for the RD 17 Preferred Plan. Because the RD 17 Preferred Plan meets the project objectives, is practicable and flood protects 43,600 residents who would otherwise be exposed to exacerbated flooding conditions associated with the TSP, the USACE must revise the FR/EIS/EIR to include a robust analysis of the RD 17 Preferred Plan and incorporate this information throughout the entire document.

The USACE's Decision to Reject from Further Consideration RD 17 Levee Alternatives is Pre-Decisional and Deprived the Public of a Meaningful Opportunity to Review and Comment on the USACE's Proposal and Alternatives.

The USACE's decision to omit the RD 17 Preferred Plan and its refusal to consider a more detailed level of analysis of the RD 17 Alternatives (Alternatives 7b, 8b, and 9b) in the FR/EIS/EIR was pre-decisional and violated Federal limitations on actions during the NEPA process. Specifically, until the USACE issues a record of decision (ROD) as provided in Title 40 of the Code of Federal Regulations section 1506.2, Section 1506.1 prohibits the USACE from undertaking any action which would limit the choice of reasonable alternatives (see USACE ER 200-2-2). Predetermination occurs when an agency irreversibly and irretrievably commits itself to a plan of action that is dependent upon the NEPA [and CEQA] analysis before that analysis has been completed (see e.g., *Cedar-Riverside Environmental Defense Fund v. Hills*, 422 F. Supp. 294 (D. Minn 1976), judgment vacated, 560 F. 2d 377 (8th Cir. 1977) (bias found when agency prematurely focused on project alternatives).

Here, the USACE prematurely selected and committed to the TSP, and then rejected from further review any alternatives involving the RD 17 levees *before* releasing the Draft FR/EIS/ EIR for public review and comment because the USACE claims now that flood protection in RD 17 conflicts with Executive Order 11988 on Floodplain Management (see page 3-64). Such a decision conflicts with the decades of flood protection the USACE previously provided to the area. Since RD 17 was informed by SJAFCA before the release of the Draft FR/EIS/EIR that the USACE intended to remove from consideration the RD 17 levee alternatives, we requested that SJAFCA identify for CEQA purposes the local sponsors' alternatives to reduce flood risk in RD17 (see attached Exhibit A). Although SJAFCA requested that the USACE consider this information in the Draft FR/EIS/EIR document, the USACE refused to include the RD 17 Preferred Plan and instead released the document and pre-determined the outcome of the planning process.

The USACE's Process is Arbitrary and Capricious in Violation of the APA.

The USACE's decision-making process concerning the selection of Alternative 7a as the TSP violates the Administrative Procedures Act (Pub.L. 79-404, 60 Stat. 237). The USACE decided to remove from consideration the RD 17 Alternatives from detailed review in the FR/ EIS/EIR on the basis that the alternatives do not comply with Executive Order 11988 before it even considered the public's comments on the Feasibility Report and before completing the NEPA process. Further, the basis for selecting Alternative 7a as the TSP is without support, and the USACE's decision was arbitrary and capricious and an abuse of discretion under the Administrative Procedure Act, 5 U.S.C. § 706 (1980) ("APA"). In applying the "arbitrary and capricious" standard of the Administrative Procedure Act, a court will consider the administrative record already in existence. (*See e.g., Camp v. Pitts,* 411 U.S. 138, 93 S.Ct. 1241, 36 L.Ed.2d 106 (1973); *Avoyelles Sportsmen's League, Inc. v. Marsh,* 715 F.2d 897 (5th Cir.1983)). As the administrative record shows, the Draft FR/EIS/EIR documents the USACE's decision to proceed with Alternative 7a as the TSP and the preferred project before completing the NEPA process and before informing the public that it already made up its mind that it would exclude improvements to the RD 17 levees. The USACE's actions are arbitrary and capricious because the USACE attempted to justify its decision to remove the RD 17 Alternatives from further consideration by (1) claiming that Executive Order (EO) 11988 prohibits the USACE from making a Federal investment in RD 17 when it does not, and (2) failing to disclose to the public that the Draft FR/EIS/EIR not only removes from consideration RD 17 Alternatives, but the USACE has actually selected an alternative, Alternative 7a as the TSP which exacerbates flood hazards to the 43,600 residents. (*See e.g., Greater Yellowstone Coalition v. Lewis,* 628 F.3d 1143, 1148 (9th Cir. 2010) (as amended) (relying on *The Lands Council v. McNair,* 537 F.3d 981, 987 (9th Cir. 2008) (en banc), *overruled on other grounds by Winter v. Natural Res. Def. Council,* 555 U.S. 7 (2008)); *Envtl. Def. Ctr.*, 344 F.3d at 858 n.36; *Brower*, 257 F.3d at 1065). For these reasons, the USACE's actions violate the APA.

<u>The USACE Failed to Comply with its own SMART Planning Procedures.</u>

The USACE claims to follow the guidance contained in the Planning Bulletin No. PB 2013-03-Reissue (14 March 2014) regarding the SMART Planning Milestones, but it did not. Specifically, the USACE did not consider and disclose the effects of a reasonable range of alternatives that met its planning objectives for the LSJRFS.

First, under the SMART planning procedures, the TSP Milestone marks "vertical team concurrence on a single plan the PDT will carry forward in the feasibility study...." (PB 2013-03-Reissue, page 1, Item 4). The Planning Bulleting indicates that the identification of the TSP, however, does not preclude the PDT from also presenting another plan (PB 2013-03-Reissue, page 1, Item 4). The USACE did not do that. Instead, the USACE indicated that the single plan it will carry forward is Alternative 7a which excludes any improvements to the RD 17 levees. While the USACE noted that Alternative 7a did not address the objectives of the local sponsors, it removed from further consideration all of the RD 17 Alternatives, and it did not identify the RD 17 Preferred Plan which would have addressed the objectives of the local sponsors. In so doing, it also prejudiced the local sponsors' ability to seek future Federal investment in a locally-supported plan for flood control improvements to the RD 17 levees.

As an example of the USACE's efforts to pre-determine the outcome of the TSP process before it even started the process (and before the public could even comment on the process), the February 2015 LSFJS Engineering Summary (page 6) expressly states that:

"Just *prior* to a TSP decision on which alternative to formulate for, USACE is recommending that only North and Central Stockton geographically defined areas be considered for TSP inclusion."

The Engineering Summary further claims that,

"The geographical area of RD-17 conflicts with USACE policy EO 11988 which is being coordinated with the sponsor" (see page 6).[1]

With that, the USACE removed the RD 17 alternatives from further consideration in the Draft FR/EIS/EIR and identified the TSP, before the document was even circulated to Headquarters for review. Then, because the TSP excluded the alternatives with the RD 17 levees, the USACE rejected the RD 17 alternatives outright from further detailed consideration in the FR/EIS/EIR claiming that the RD 17 Alternatives could not be considered because they were not identified in the TSP.

To add to the confusion, the USACE stated in the FR/EIS/EIR that,

> "A full array of alternatives will be considered and evaluated. However, feasibility level design work will focus on the agency recommended plan *and a Locally Preferred Plan (LPP)* if appropriate" (see FR/EIS/EIR at p. 1-2).

The SMART Guidance, however, does not limit the USACE to considering only the agency recommended plan or a Locally Preferred Plan. In fact, the guidance indicates that the USACE may consider other plans as explained in the Planning Bulletin - PB 2013-03-Reissue. It was misleading for the USACE to advise the public that it was limited in the alternatives that could be considered, particularly in this case where another plan, the RD 17 Preferred Plan, meets the planning objectives of the LSJRFS, protects existing residents, and is policy compliant.

Secondly, the agency's preferred plan, the TSP, does not meet the USACE's own planning objectives for the area. For example, the first 2 planning objectives in Section 2.3.3 Planning Objectives (page 2-11) state that, "the planning objectives are as follows:

- Reduce risk to property and infrastructure due to flooding in Stockton; Lathrop and Manteca (NED Account);
- Reduce flood risk to public health, safety and life in Stockton, Lathrop, and Manteca (OSE Account)."

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[1] EO 11988 is an Executive Order, and not a USACE policy. Moreover, the lands within the "geographical area of RD-17" were reclaimed pursuant to the Swamp Land Act of 1850 (U.S. Rev. Stats., sec 2479) and this is conclusively determined to be the lands which passed to the state under the act (*Foss v. Johnstone*, 158 Cal. 119 [110 P. 294]; *Bates v. Halstead*, 130 Cal. 62 [62 P. 305]. The USACE has provided flood protection to this agricultural and urbanizing area since 1963.

The USACE's TSP fails to meet its own planning objectives for half of the Study Area. Alternative 7a (which is the USACE's recommended TSP) only reduces flood risk to a portion of Stockton. RD 17 and SJAFCA informed the USACE on numerous occasions that the RD 17 Preferred Plan is either Alternative 7b or 9b (with the elimination of the secondary levee at the confluence of Old River and the San Joaquin River), with the expectation that the RD 17 Preferred Plan would be evaluated in the Draft FR/EIS/EIR. The USACE, apparently decided without any basis that evaluation and feasibility level design work was "not appropriate" and screened out all of the RD 17 Alternatives (including the RD 17 Preferred Plan) from any further design work and detailed analysis, as indicated on pages 1-6 and 3-64 of the Draft FR/EIS/EIR. Thus, the FR/EIS/EIR does not meet the USACE and local sponsors' planning objectives for the Study Area.

The FR/EIS/EIR does not comply with the USACE's December 2012 procedures entitled, "Environmental Evaluation and Compliance within the SMART Planning Framework" (the "SMART Environmental Framework"). According to page 4 of the SMART Environmental Framework:

> "Prior to this phase [preparation of the feasibility level analysis phase], and before making the *tentatively selected plan [emphasis added]* the agency recommended plan, there will be an Agency Decision Milestone that takes into consideration concurrent public/agency comments and technical, policy and legal review comments on the draft integrated feasibility report/NEPA document. At this stage, the agency has considered all impacts from the proposed plan and compared alternatives before making the final recommendation and documentation."

In this case, the USACE already screened out from further review the RD 17 Alternatives and never considered the RD 17 Preferred Plan as an alternative which should have been evaluated at a level of detail commensurate with the TSP. While the USACE informed the public in the Draft FR/EIS/EIR of its reasons for screening out alternatives (i.e., that "RD 17 has planned development which makes it difficult to comply with the EO 11988 guidance," see page 3-22), the basis upon which the USACE relies is unfounded because the water resource policies that the USACE claimed prohibited the USACE from considering the RD 17 Alternatives do not actually prohibit approval of the RD 17 Alternatives because there is planned development. Moreover, the TSP *exacerbates* flooding impacts to the existing 43,600 residents in RD 17, particularly in the lower sections of RD 17, because of the USACE's decision to improve flood protection north of RD 17 and exclude RD 17 from 100-year flood protection. Creating *greater* flood-related hazards to an *existing* population would hardly seem to comply with USACE water resources policies designed to minimize flood risk. The USACE, however chose not to disclose this information to the public.

For these reasons, the USACE must revise the FR/EIS/EIR to include the RD 17 Preferred Plan and provide a more robust analysis of the RD 17 Alternatives. The RD 17 Preferred Plan and the RD 17 Alternatives should be considered in the FR/EIS/EIR and Chapters

3, 4 and 5 must be revised accordingly. For example, the USACE should add a discussion of the RD 17 Preferred Plan on pages 3-6 and Section 3.2.5, pages 3-17 to 3-19 and Section 3.3, pages 3-22 to 3-27, and Section 3.4, pages 3-27 to 3-67 in the project description, as well as Section 4.4 Alternatives on pages 4-13 through 4-30.[2] The RD 17 Preferred Plan must be identified in the FR/EIS/EIR as the only practicable solution for reducing flood risk for RD 17 and the Study Area pursuant to the Feasibility Report's own planning objectives. If the USACE decides not to identify the RD 17 Alternatives in the Final FR/EIS/EIR, then the USACE must revise the FR/EIS/EIR to inform the public that the USACE's decision to eliminate the RD 17 alternatives will preclude the USACE's ability to provide improved FRM to the 43,000 residents and critical infrastructure located within RD 17 (see FR/EIS/EIR, page 3-56).

Removal of RD 17 Alternatives From Consideration Violates EO 11988.

Issued by the President of the United States on May 24, 1977 and recently amended by President Obama on January 30, 2015, Executive Order (EO) 11988, entitled "Flood Plain Management," seeks to minimize actions by Federal agencies which may adversely affect floodplains. EO 11988 and its implementing regulations direct Federal agencies to evaluate the effects of the proposed action on floodplains and to avoid taking action which would affect such areas unless there are no practicable alternatives (see 44 Fed. Reg. 28524, *et seq*, now published at 33 C.F.R. part 240). The USACE's decisions related to Executive Order 11988 are subject to judicial review under the Administrative Procedures Act (see e.g., *City of Carmel by the Sea v. U.S. Department of Transportation*, 123 F.3d 1142 (9th Cir. 1997).

The USACE follows an 8-step process to evaluate the effects of a Federal project on the floodplain as described in the Draft FR/EIS/EIR on pages 2-52 – 3-58). If an action is located within the floodplain, the USACE must advise the public about the action and then identify the beneficial and adverse impacts of the action and any expected losses of natural beneficial floodplain values. If the action is likely to induce development in the base floodplain, then the USACE must determine "whether a practicable non-floodplain alternative for the development is available" and if one is not, then the USACE must advise the public regarding its findings.

Over the years, RD 17 has continued to fulfill its obligations to maintain and operate the Federal project levees and to repair the levees, as necessary, to restore the functioning of the system and protect people within the RD 17 boundaries from 100-year events. In 2010, however, the USACE changed the methodology for assessing levee integrity and applicable levee seepage standards that govern whether an area is within the 100-year floodplain (even though this determination has been historically made by the Federal Emergency Management Agency) (FEMA). After changing the levee standards, the USACE concluded that the RD 17 Federal project levees which (the USACE built) do not meet the USACE's new standards, and so now the USACE found that the Federal project levees no longer provide 100-year flood

[2] The local non-Federal sponsors did not propose a secondary levee because it added significantly to the cost of construction and maintenance since improving the existing levee is necessary to avoid significant hydraulic consequences downstream. Further, abandoning the existing levee would conflict with federal law, the expectations of private ownership and the contracts regarding the operations and management of the USACE project levees.

protection. But then, rather than plan to fix the levees through this Feasibility Report, the USACE concluded that it is unable to fix the levees because EO 11988 prohibits the USACE from fixing the Federal levees to comply with the USACE's new standards.

But it doesn't stop there. In the Draft FR/EIS/EIR, the USACE first said that the impact analysis of alternative plans was based only upon an evaluation of effects,

> "against existing conditions since these conditions either reasonably represent future conditions in the project area or because using existing conditions will facilitate full evaluation and disclosure of the greatest potential impacts of the proposed project" (see page 5-1).

Page 1-21, however, which lists all of the projects and programs affecting the San Joaquin River levee system does not describe any improvements to the Federal Project levees in RD 17 since FEMA accreditation of discrete levee segments in RD 17 in 1990. For the past 25 years, however, the USACE has undertaken repairs and improvements to the RD 17 levees and RD 17 has obtained approval for and completed construction of two phases of the San Joaquin River Levee Stability Program. None of these projects are reflected in the existing or future baseline conditions, even though, the USACE changed its mind in the Draft FR/EIS/EIR and indicated that the analysis of alternative plans for flood control was based upon existing and future hydrologic and hydraulic conditions (see page 5-30). What happened to the 25 years of flood protection improvements to RD 17 levees that resulted in prior determinations that this area is not located within the 100 year floodplain?

The USACE decided to ignore the 25 years of existing flood control-related projects, and instead treat these *past and present* efforts to repair the existing levees and take the area out of the 100 year floodplain as *future* projects (see Draft FR/EIS/EIR pages 5-364 and 365). Then, because the USACE found that the RD 17 area is in the 100-year floodplain (which it is not), the USACE concluded it could not approve *any* RD 17 Alternatives to protect the existing 43,600 residents because that would be "unwise." The USACE claims that it is "unwise" to fix the RD 17 levees to reduce flood risk to Lathrop, Manteca, and portions of Stockton (which are urban and urbanizing parts of the Study Area) on the basis that the Cities' existing land use planning efforts (which relied on Congress' direction to reclaim the land under the Swamp Lands Act and the Federal investment made since 1958 to take the area out of the 100-year floodplain) could further induce development in an area that was already meant to be urbanized. That, according to the USACE, is not allowed. The very agency who built or accepted the levees in the first place has now decided it is prohibited from fixing the levees to continue protecting 43,600 existing residents, because Lathrop and Manteca planned for future development in this area in reliance on the 100-year flood protection the USACE provided under the Lower San Joaquin River and Tributaries Project. Rather than disclose the full range of impacts to the existing communities in accordance with EO 11988, the USACE, instead, chose to violate Congress' directives under the Swamp Lands Act and ignore the years of flood protection efforts implemented as part of the Lower San Joaquin River and Tributaries Project.

RD 17 is not in the 100-year floodplain as determined by FEMA. As even the Draft FR/EIS/EIR indicates (see pages 5-364 and 5-365), RD 17 has implemented Phases 1 and 2 of the seepage and repair project to fix seepage issues based on the USACE's new criteria, that the USACE is now using as the reason it has decided RD 17 is in the 100-year floodplain. Since the area is not in the 100-year floodplain as determined by FEMA, EO 11988 limitations on approving projects which may be growth-inducing should not even apply. If, however, the USACE continues to assume the RD 17 area is in the 100-year floodplain, then the USACE must revise its EO 11988 analysis to reflect the true existing and baseline conditions, and disclose the human and environmental impacts that the USACE's decisions concerning the TSP will have on the local communities. We request that the following information be incorporated into the FR/EIS/EIR discussion on pages 3-51 through 3-58 and pages 5-358 through 5-360, and all other applicable sections for consistency purposes.

- The RD 17 area is not in a natural floodplain. The area is already developed with a mix of urban residential, commercial, industrial, public/quasi-public uses, and commercial agriculture in reliance upon the existing Federal Project levee system.

- The RD 17 Preferred Plan (i.e., improvement of the existing RD 17 levees with the dry land / tie-back) is the only practicable alternative to reduce the flood risk to the 43,600 residents and billions of dollars of public and private investment including in particular Interstate 5, Highway 120, the San Joaquin County Hospital, the San Joaquin County Jail and correctional facilities, numerous schools, health care facilities, the City of Lathrop Civic Center, fire stations and police facilities. Interstate 5 and State Route 120 are critical evacuation routes.

- As flood risks increase due to climate change or re-evaluation of potential flood flows, the area dependent upon protection from the RD 17 levees will extend to the north and east encompassing the Sharpe Army Depot, critical rail facilities and major portions of the City of Stockton including the Port and the Regional Wastewater Treatment Facilities. Failure to increase the flood protection for RD 17 also increases the risk of flood damage to the environment and human health and safety. Loss of life, injury and disease for approximately 43,600 humans, as well as, pets and terrestrial species, stranding and predation of fish species including those with special status, loss of riparian habitat along the levee breaks and those areas eroded by the high velocity flows in the vicinity of the levee break, contamination of flood waters both within the flooded areas and the areas to which the flood waters will be discharged and severe vandalism and looting are all significant impacts that flow from the failure to provide adequate flood protection for RD 17.

- Even if the RD 17 levees are considered to be within the 100-year floodplain (which is not the case when the USACE considers the effectiveness of RD 17's levee seepage repair projects), the RD 17 Preferred Plan would take the area out of the 100-year floodplain. Assuming that the RD 17 area would be located outside of the 100-year floodplain, whether or not additional development would actually occur in RD 17 would not impact the USACE's obligation to disclose indirect impacts or any measures to minimize the alternative's effects. Contrary to the statements made in the FR/ EIS/EIR (see e.g., pages 3-54 through 3-67), Executive Order 11988 and the implementing guidance do not prohibit the USACE from considering a project which is designed to protect existing residents and land uses because future development or growth may occur. In fact, EO 11988 requires only that the USACE disclose to the public that the proposed alternative is the "only practicable[3] alternative," and design a plan in which steps are taken to minimize potential damage to the floodplain (see e.g., *City of Carmel by the Sea v. U.S. Department of Transportation*, 123 F.3d 1142 (9th Cir. 1997)).

Removing RD 17 Alternatives From Further Consideration Violates EO 12898 on Environmental Justice.

The Draft FR/EIS/EIR includes a cursory discussion regarding the effects on low income and minority populations due to the proposed TSP. The Draft FR/EIS/EIR relies upon the Lower San Joaquin River Feasibility Report Other Social Effects Regional Economic Development report dated February 15, 2015 ("Social Effects Report") to support its conclusions. The assessment, however, is based only upon social characteristics of Stockton and California (see Table 2, page 7). Other than population density information, no data was provided regarding the minority and low-income status of residents within Lathrop, Manteca and Southern San Joaquin County. The exhibits included in the Social Effects Report further confirm that Alternative 7A results in no improvement whatsoever in flood protection for RD 17.

The Draft FR/EIS/EIR states on page 7-5:

> "No disproportionately high or adverse human health or environmental effects on minority or low-income communities have been identified."

Page 5-260 of the Draft FR/EIS/EIR, however, reaches a contrary conclusion finding that Alternatives 7a, 8a, and 9a would not address flood risk in RD 17 which would impact an area that is "more than 50 percent populated by minorities."

The USACE failed to inform the public that 43,600 residents in RD 17, many of whom would meet the definitions of minority and low-income for purposes of an environmental justice analysis, would be adversely impacted by the USACE's decision to proceed without flood risk management for RD 17. We understand that the City of Lathrop has submitted additional demographic data regarding the residents in the Lathrop portion of RD 17 to further illustrate the disproportionate impact on local residents. Accordingly, the analysis must be revised.

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[3] See e.g., the Federal Highway Administration's definition of "practicable" which is defined as "capable of being done within reasonable natural, social, or economic constraints" (23 CFR 650.105(k). This definition resembles the Section 404(b)(1) Guidelines which define practicability in terms of costs, logistics and other technological considerations.

The Draft EIS is Inadequate and Fails to Comply with NEPA and CEQA.

We understand that the local communities of Lathrop, Manteca and Stockton are submitting comments on the Draft FR/EIS/EIR. RD 17 hereby, incorporates by reference into RD 17's comments any comments submitted by the local municipalities. We further understand that SJAFCA recently submitted comments on the Draft FR/EIS/EIR. RD 17 incorporates by reference SJAFCA's April 9, 2015 critical comments on the Draft FR/EIS/EIR.

We also offer the following specific comments concerning the Draft FR/EIS/EIR's failure to adequately evaluate the RD 17 Alternatives and to properly disclose the impacts of Alternative 7a, the TSP plan, as the USACE's preferred alternative.

- The Notice of Intent to Prepare a Joint EIS/EIR for the Lower San Joaquin River Feasibility Study indicated that the USACE will "evaluate alternatives, including a locally preferred plan or other plan, for providing flood damage reduction and ecosystem restoration along the lower (northern) portion of the San Joaquin River System" (see 75 Fed. Reg. 2517). The USACE did not do that. Instead, the Draft FR/EIS/EIR evaluates in detail Alternative 7a, but it fails to evaluate in any detail the RD 17 Preferred Plan, and rejects from consideration any of the RD 17 Alternatives so there is little, if any, detailed analysis to accompany the EIS/EIR impact discussions. Consequently, the RD 17 Preferred Plan must be added to Chapter 3 in the FR and included in the evaluation of impacts and mitigation measures for RD 17 Preferred Plan throughout Chapters 5 through Chapter 9.

- *Chapter 5.4, the discussion of Alternative 7a on page 5-32* states that Alternative 7a would have a significant beneficial impact by reducing the exposure of people to a significant risk of loss, injury or death due to flooding, and that this alternative would not substantially alter drainage patterns. The Draft FR/EIS/EIR, however fails to disclose that the residents in RD 17 who would not receive a reduction in flood risk, would actually be exposed to a *greater* risk of flood hazards. This information should be added to Chapter 5.4.

- *Chapter 5.8 (see e.g., Pages 5-98, 5-104, 5-109 and 5-114)* states that "levee repairs and improvements would provide future flood-risk protection, as well as carbon sequestration (due to restoration of riparian habitat associated with levee repair and improvement)." While this may be true for the North and Central Stockton areas, it is not the case for RD 17. This discussion should be revised, accordingly, and a discussion of the RD 17 Preferred Plan should be added to Chapter 5.8.

- *Chapter 5.9 (see e.g., Pages 5-139, 5-159, and 5-160)* describes impacts to SRA habitat associated with Alternative 7b. Please explain what portion of this impact (if any) would be due to the secondary levee (which RD 17 does not support as a practicable alternative).

- *Chapter 5.14, Pages 5-270 to the third full paragraph on page 5-271* states that the changes in land use from the implementation of Alternative 7a do not conflict with land use plans, policies, or regulations. This statement does not accurately describe the impacts that would occur to the existing land uses, residents, businesses, and major public facilities and infrastructure within RD 17 that would be exposed to existing and increased risk of flood hazards due to the selection of Alternative 7a as the TSP, as well as the conflicts with the adopted general plans and policies for the cities of Lathrop, Manteca and Stockton.

- *Chapter 5.23, Cumulative Impacts* - The Draft FR/EIS/EIR fails to accurately disclose the cumulative impacts associated with Alternative 7a and the significant and unavoidable environmental impacts on RD 17 associated with implementation of Alternative 7a. For example, assuming RD 17 is in the 100-year floodplain (which it is not), no analysis is provided of the hydrology and flood impacts resulting from Alternative 7a's failure to flood protect RD 17 as further discussed above (see FR/EIS/EIR, pp. 5-386-387). Additionally, the Draft FR/EIS/EIR is silent on the fact that Alternative 7a would exacerbate flooding impacts to RD 17 and to the 43,600 residents that will experience greater flood risk. Further, the Draft FR/EIS/EIR analysis of cumulative impacts incorrectly treats all three phases of the RD 17 seepage repair project as if they are future projects. In fact, Phases I and II exist today and are part of existing conditions. Thus, the USACE must revise the FR/EIS/EIR to accurately reflect the baseline conditions for purposes of measuring the project's impacts and cumulative impacts under NEPA (40 C.F.R. § 1508.7) and in accordance with CEQA Guidelines Section 15130. Consequently, the USACE must revise the cumulative impact analysis and incorporate this analysis into the Final FR/EIS/EIR in order to accurately reflect cumulative impacts to RD 17.

The Draft EIR suffers from the same defects as the EIS, and thus, should be revised as set forth above to comply with CEQA for the same reasons.

The USACE failed to comply with the Section 404(b)(1) Guidelines.

The Section 404(b)(1) Evaluation included as an appendix to the Draft FR/EIS/EIR states that the overall purpose of the project is to reduce flood risk to urban and urbanizing parts of the study area, including the City of Stockton (Appendix A-4, page 5). The Section 404(b)(1) Evaluation fails to acknowledge that the original purpose was to reduce flood risk for the entire Lower San Joaquin River Basin. Moreover, the only alternatives evaluated in the Section 404(b)(1) Evaluation, other than the No Project Alternative, are Alternative 7a, 8a and 9a. The USACE removed from consideration the RD 17 Alternatives on the basis that they were impracticable because the USACE claimed that these alternatives do not comply with USACE water resources policies. The USACE's decision is puzzling at best. Now the USACE has found that an alternative which would require that the USACE maintain the Federal project levee system it was responsible for in the first place, is no longer practicable because that same Federal agency decided the same Federal project levee system is not consistent with that Federal agency's water resources policies. As a result, the Section 404(b)(1) Evaluation did not, but should have, evaluated the RD 17 Preferred Plan because this alternative is a practicable alternative in terms of costs, logistics, and technological considerations. Consequently, the Section 404(b)(1) Evaluation must, at a minimum, be revised to include the RD 17 Plan as a practicable alternative.

We appreciate your consideration of our comments on the FR/EIS/EIR and look forward to the USACE's issuance of a revised FR/EIS/EIR with the requested analysis of the RD 17 Preferred Plan and the clarifications regarding the extent of the Alternative 7a impacts to RD 17.

Sincerely,

BUCHALTER NEMER
A Professional Corporation

By
Alicia Guerra

AG:al

Attachments

cc: Tyler Stalker
Dante Nomellini
Jim Giottonini, SJAFCA
Roger Churchwell, SJAFCA
Glenn Gebhardt, City of Lathrop

SJAFCA
San Joaquin Area FLOOD CONTROL Agency

RECEIVED
FEB 25 2015
BY

February 23, 2015

Alicia Kirchner, Chief
Planning Division, Sacramento District
U.S. Army Corps of Engineers
1325 J Street, Room 802
Sacramento, CA 95814

LOWER SAN JOAQUIN RIVER FEASIBILITY STUDY

Thank you for all of the work that the U.S. Army Corps of Engineers continues to do in support of flood risk reduction for the Lower San Joaquin River. I am writing today to ask that you consider including the language in the attached document in the draft Lower San Joaquin River Feasibility Study and joint EIS/EIR scheduled to be released at the end of this month. One of our supporting local agencies, Reclamation District 17, has asked that this language be included as a CEQA-only section in order to keep, as broad as possible, the discretion of the agencies that will need to certify the document under CEQA.

SJAFCA remains excited to see the draft document scheduled to be released at the end of the month and will be traveling to Washington DC next week to support our request for additional funding from the USACE Workplan to allow completion of the study.

Please do not hesitate to contact me if you have any questions.

Giotto

JAMES B. GIOTTONINI
EXECUTIVE DIRECTOR

JBG:dc

Attachment

cc: Scott Shapiro, Downey Brand
Dante Nomellini, Nomellini, Grilli & McDaniel
Eric Koch, Department of Water Resources

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SAN JOAQUIN AREA FLOOD CONTROL AGENCY
SAN JOAQUIN RIVER BASIN LOWER SAN JOAQUIN RIVER

STATEMENT OF DIFFERENT TREATMENT OF ALTERNATIVES IN ENVIRONMENTAL IMPACT REPORT (CEQA)

The U.S. Army Corps of Engineers (USACE) and its non-Federal sponsors, the San Joaquin Area Flood Control Project (SJAFCA), and the State of California Central Valley Flood Protection Board, propose to improve flood risk management in the Lower San Joaquin River Basin. The USACE and SJAFCA have prepared an Integrated Interim Feasibility Study and Joint Environmental Impact Statement (EIS)/Environmental Impact Report (EIR) for the proposed Lower San Joaquin River Flood Risk Management Project. The joint EIS/EIR is intended to meet the requirements of both the National Environmental Policy Act ("NEPA") and the California Environmental Quality Act ("CEQA"). SJAFCA prepared this Statement to the Environmental Impact Report in order to include solely for CEQA purposes the alternatives for reducing flood risk in RD17 which due to the USACE analysis of EO11988 were screened from the final set of alternatives in the joint EIS/EIR. Reducing flood risk in RD 17 is critical to the integrity of the flood control system for the entire feasibility study area and needs to be accomplished with or without federal assistance. The RD 17 improvements may be constructed separately from any USACE funded project. The two alternatives retained for CEQA purposes are 7b and 9b with the variation of excluding what has been referred to the secondary levee at the confluence of Old River and the San Joaquin River.

The USACE and SJAFCA conducted the Interim Feasibility Study and followed the Federal planning process for the development of water resource projects in order to identify a Tentatively Selected Plan (TSP) recommendation to Congress for authorization. The overall purpose of the proposed flood management project is to reduce flood risk to urban and urbanizing parts of the study area as further explained in Chapter 3 of the Integrated Feasibility Study/Joint EIS/EIR. The final array of alternatives involve improving levees or constructing new levees located in the base 1% (1/100) annual chance exceedance (ACE) floodplain.

During the Feasibility Study process, a preferred alternative was identified, limited by the USACE determination to screen out alternatives, in order to proceed with the TSP. The TSP reflects the identification of Alternative 7a as the NED Plan which serves to set the level of federal participation in a project resulting from the Feasibility Study. SJAFCA, however, has confirmed with its local participating agencies that while Alternative 7a provides flood risk management for North and Central Stockton, Alternative 7a does not meet the non-Federal sponsor's objectives of flood risk management and SB 5 compliance for RD 17 and the Cities of Lathrop and Manteca because Alternative 7a excludes flood control improvements and flood management for RD 17.

By contrast, the local non-Federal sponsors support Alternative 7b and 9b as consistent with their project objectives to include flood protection for RD-17. As described in further detail in Chapter 3 of the Feasibility Study, Alternatives 7b and 9b included flood risk management improvements in RD 17. Alternatives 7b and 9b would implement the same levee improvements

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and closure structures as Alternatives 7a and 9a but would include levee improvements on the existing RD17 levees and approximately 2.2 miles of new levees (dry land or tie-back levees) extending to the east. The Alternatives 7b and 9b new levees would include a cut off wall to address potential seepage issues. Although Alternatives 7b and 9b include RD-17 improvements consistent with the local sponsor's objectives, the local sponsors are not proposing a secondary levee at the confluence of Old River and the San Joaquin River ("Secondary Levee").

Accordingly, as the CEQA Lead Agency, SJAFCA is evaluating Alternatives 7a and 7b and 9a and 9b in the Joint EIS/EIR in order to provide a full evaluation of the environmental impacts associated with the TSP, should the Federal government fund the NED Plan, as well as Alternatives 7b or 9b without the secondary levee which would be consistent with the local sponsor's proposed project and project objectives. Additionally, this statement to the EIR evaluates the environmental impacts of elimination of the secondary levee on Alternatives 7b and 9b.

The secondary levee at the confluence of Old River and the San Joaquin would be redundant to the existing levee. The existing levee is necessary to avoid significant changes in the hydraulics of the flow split between Old River and the San Joaquin. More flow in the San Joaquin will increase flood risk to downstream areas including the City of Stockton, the Stockton Port and the Regional Wastewater Treatment facilities. The redundant levee would greatly increase the cost of construction and maintenance in that the existing levee will in any event need to be improved to provide the needed level of protection for downstream areas. Construction of the secondary levee would also add significantly to the impacts to the ongoing agricultural operations.

Improvement of the existing RD 17 levees with the dry land / tie-back is the only practicable alternative to reduce the flood risk to the 43,000 residents and billions of dollars of public and private investment including in particular Interstate 5, Highway 120, the San Joaquin County Hospital, the San Joaquin County Jail and correctional facilities, numerous schools, health care facilities, the City of Lathrop Civic Center, fire stations and police facilities. As flood risks increase due to climate change or re-evaluation of potential flood flows the area dependent upon protection from the RD 17 levees will extend to the north and east encompassing the Sharpe Army Depot, critical rail facilities and major portions of the City of Stockton including the Port and the Regional Wastewater Treatment Facilities.

Failure to increase the flood protection for RD 17 also increases the risk of flood damage to the environment and human health and safety. Loss of life, injury and disease for humans, pets and terrestrial species, stranding and predation of fish species including those with special status, loss of riparian habitat along the levee breaks and those areas eroded by the high velocity flows in the vicinity of the levee break, contamination of flood waters both within the flooded areas and the areas to which the flood waters will be discharged and severe vandalism and looting are all significant impacts that flow from failure to provide adequate flood protection for RD 17.

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Attachment Three

Technical Memorandum

PETERSON . BRUSTAD . INC .
ENGINEERING . CONSULTING

Analysis of Development Risk Resulting from Levee Improvements to ULDC Standards

Prepared for: Cities of Lathrop and Manteca *April 9, 2015*

Prepared by: Dave Peterson
Reviewed by: Mike Rossiter

Chapter 3 of the USACE *Lower San Joaquin River Project Interim Report, San Joaquin County, California, Draft Integrated Interim Feasibility Report/Environmental Impact Statement /Environmental Impact Report*, February 2015 (LSJRFS), evaluates policy compliance of Federal participation in a project to improve the RD 17 levees relative to Executive Order 11988. The primary concern identified by the USACE regarding EO 11988 compliance is the inducement of urban development within the already developed and levee protected floodplain. USACE estimated that there are approximately 12,500 acres of levee-protected land within RD 17 that could be urbanized, thereby increasing the population protected by RD 17 levees.

The non-Federal sponsors for the study, SJAFCA and the California Central Valley Flood Protection Board (CVFPB), were concerned that the 43,000 residents and billions of dollars of public and private assets that are already in place would be deprived of additional flood risk reduction as a result of the USACE evaluation. The quantity of developed but not yet urbanized land in RD 17 raised issues for USACE of whether inclusion of RD 17 would be compliant with EO 11988. For this reason, USACE excluded RD 17 alternatives from the final array of alternatives, and the non-Federal sponsors reluctantly accepted the exclusion to avoid further delay and/or cancelation of the study and to facilitate release of the draft for concurrent public and vertical team review. However, the non-Federal sponsors conditioned their acceptance on further consideration of the issue either within the LSJRFS, or in a subsequent study focused on RD 17. The non-Federal sponsors believe that EO 11988 should not be an obstacle to further federal investment in the RD 17 levees.

This memorandum is intended to address one of the issues at the core of EO 11988 in which a levee improvement project is said to induce growth in the floodplain and increase economic risk. This concern is shared by the State of California. The hypothesis being that expected annual damages (EAD) would decrease in the years immediately following completion of a levee improvement project, but that induced urban growth would end up increasing EAD over time, eventually exceeding without project EAD at some point in the future.

The draft LSJRFS provides the information needed to test this hypothesis, and is the basis for the analysis presented in this memorandum.

RD 17 current (2015) conditions
Developed acreage = 8,100 (based on numbers provided by Lathrop, Manteca, Stockton, and San Joaquin County)
Without project EAD = $25M/yr (LSJRFS Table 3-13)
With project EAD = $1M/yr (LSJRFS Table 3-13)

RD 17 future conditions, without project
Developed acreage = 8,100 (SB 5 precludes growth absent 200-year protection)

RD 17 future conditions, with project
2030 developed acreage = 8,100 + 5,300 = 13,400 (LSJRFS Section 3.6.1 step 4b identifies 5,300 acres of additional development in the General Plans of the cities and county)
2070 developed acreage = 8,100 + 5,300 + 7,200 = 20,600 (LSJRFS Section 3.6.1 step 4b identifies 7,200 acres of remaining land that could potentially be developed beyond the General Plans.)

PBI assumptions:

- Assume future development is similar in character to existing development, and that EAD can simply be extrapolated in proportion to developed area. So ignoring inflation, year 2030 with-project EAD = $1M + (5300/8100)*$1M = $1.7M. Similarly, year 2070 EAD = $1M + (12500/8100)*$1M = $2.5M:
- Assume that full buildout of all vacant ground under with project conditions would occur by the 2070 LSJRFS planning horizon. This is not the plan of any of the land use authorities, but the USACE's concern is that these plans change, so full buildout is the most conservative (high side) growth assumption.
- Assume that under without project conditions that growth is held at current levels due to SB 5 growth restrictions where 200-year flood protection does not exist.
- Assume that property values escalate at 2%/yr under both with- and without-project conditions.
- Assume the project is completed by the year 2020

Figure 1 presents EAD over time. Both with- and without project EAD start out at $25M/yr. Assuming no further growth under without project conditions, EAD continues to escalate due to property inflation to $33.6M/yr in 2030 and $74.3M/yr in 2070. Under with-project conditions, EAD drops to $1.3M/yr in 2020. This is greater than the published USACE estimate of $1M/yr, because we assume that 1/3 of the 5,300 acres builds out during the 2015-2020 timeframe, and there are 5 years of escalation. By year 2030 and 2070, growth plus escalation increase the with-project EAD to $2.2M, and $7.6M, respectively. Figure 2 presents the same data without property escalation.

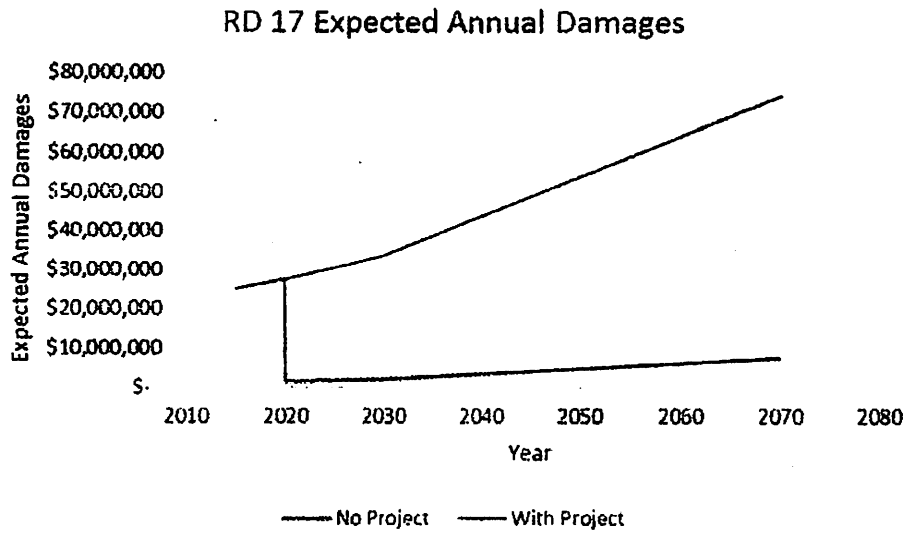

Figure 1. Comparison of residual economic risks for without- vs. with-project (assumes 2% property inflation).

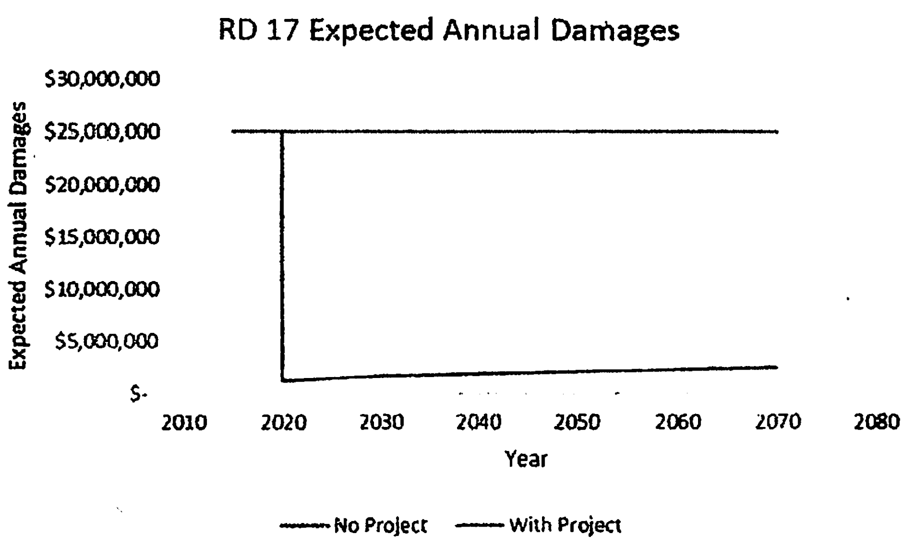

Figure 2. Comparison of residual economic risks for without- vs. with-project (no property inflation.

Both figures illustrate that without-project damage risk far exceeds with-project risk, and that the curves never cross. If inflation is considered, the curves diverge.

Life safety risk was not evaluated explicitly. It is reasonable to assume that life safety risk will generally trend with economic risk. However, in the case of RD 17 where geotechnical failure mechanisms dominate without-project conditions, failures are unpredictable and sudden, and evacuation is an ineffective risk management tool (LSJRFS Hydraulic Design Appendix, Section 4.7). Levee improvements under any of the LSJRFS "b" alternatives would remediate the geotechnical failure risk, so residual life safety risk would be primarily from overtopping, which can be forecasted several days in advance. So qualitatively, without- and with-project life safety risk curves are likely to diverge even more than economic risk curves.

PBI's conclusion is that both economic and life safety risk would be substantially reduced, and that this reduction would be sustained for the long term, if the RD 17 improvements included in the LSJRFS "b" alternatives are constructed, even when factoring in the most aggressive growth projections.

ATTACHMENT FOUR

TO RD 17 comments to LSRFS/DEIS/EIR

Life safety and critical infrastructure pose a significant concern for the basin. The USACE LSJRFS highlights this:

> *"The flood warning time varies throughout the area and is dependent on the source and type of flood event. The principal sources of flood warnings are advisories by the National Weather Service (NWS) and river stage forecasts by the California Nevada River Forecast Center (CNRFC). The flood warning time would likely be greater for an overtopping related breach than a geotechnical failure type breach. It is estimated that flooding from a geotechnical type levee breach would have little to no advance warning (less than 1 hour) and the flood wave would rapidly inundate the immediately adjacent areas.. Whereas, flooding from an overtopping related breach would likely have 24 to 48 hours of advance warning, due to forecasted reservoir operations. Therefore to answer whether the time would be sufficient to avoid loss of life and injury in critical infrastructures depends on the type and sources of flood event in the floodplain. It is highly unlikely that effective evacuation could occur if an unforeseen levee breach were to occur along the San Joaquin River or Delta Front."*
> *"Levee breach scenarios. Inundation maps were developed for fifteen levee breach locations within the study area. These breach locations were spatially distributed throughout the study area to reflect the floodplain characteristics. All breach scenarios assume levees were overtopped without failure at all locations other than the breach location. Breaches were simulated for 50% (1/2) ACE, 10% (1/10) ACE, 4% (1/25) ACE, 2% (1/50) ACE, 1% (1/100) ACE, 0.5% (1/200) ACE, and 0.2% (1/500) ACE events. The resulting inundation maps are hypothetical simulations of levee failures and do not represent the probability of occurrence (Appendix B.2, Hydraulic Design). For evaluation of life loss consequence the study area can be divided into a breach zone, zone with rapidly rising water, and a remaining zone (Jonkman, 2008). Simulations of levee breaches at the peak stage of a 1% ACE event were used to evaluate characteristics of each zone. Breach characteristics for other event magnitudes would be similar.*
>
> *Breach zone. The breach zone is characterized by destruction of buildings and the highest life safety consequence. Yonkman describes this area as having velocities greater than 6 fps and the product of depth and velocity greater than 22 ft^2 per second. For the Lower San Joaquin Feasibility study, the limit of this zone is estimated to range from 250 feet to 7,600 feet from the breach location. The results indicate a breach zone of approximately 250 feet for the Calaveras River, Mormon Slough, and upper reaches of French Camp slough. The breach zone for Lower San Joaquin River, Delta, and Lower French Camp Slough could be as*

much as 7600 feet. This was based on the evaluation of the maximum velocity and maximum depths in breach simulations."

For persons with limited-mobility (sick, infirm, incarcerated), this issue is compounded. Many of the dead from Hurricane Katrina were limited mobility persons. The jail and hospital complex off Mathews Road in RD 17 contains a high concentration of particularly vulnerable limited mobility people.

But this is not to understate the threat to other critical infrastructure. Law enforcement and fire station command and control centers could be rapidly flooded, schools which are used as emergency shelters and evacuation centers, and thousands of ordinary people would be in the breach zone.

San Joaquin County Office of Emergency Services (OES) and RD 17 have developed a model emergency response plan. However, it's effectiveness at preventing substantial human tragedy in a geotechnical failure situation is limited.

Compounding the threat to life safety is flood risk to Interstate 5 and Highway 120 which are critical evacuation routes for the region. The USAEE analysis fails to realistically account for this risk in its determination that there is no federal interest in flood protection for RD 17.

For these reasons, local, state, and Federal interests should all recognize the overriding considerations of life safety in support of further improvements to RD 17's levees.

ATTACHMENT FIVE

TO RD 17 comments to LSRFS/DEIS/EIR

The assumption that RD 17 will be fully urbanized is not supportable. The following residual risk mitigation measures are being employed by agencies in the RD 17 and should be analyzed:

1. *State & Federal Restrictions:* California Senate Bill 5 (signed 2007) prevents urban growth without 200-year protection. SB 5 precludes development unless 200-year protection exists, and institutes strong linkages between local land use and prudent floodplain management. Key among these linkages are requirements to amend local General Plans and zoning ordinances to reflect flood risk, modification to building codes, prohibition of permits and entitlements unless 200-year level of protection is demonstrated.
2. *Local Land-Use & Zoning Restrictions:* The General Plans (GPs) of San Joaquin County and the three cities in the RD 17 area limit urban growth to infill and growth at the fringe of the 3 cities. The GPs call for continued agricultural land use at all other points in the basin. Local land use policies and ordinances include numerous restrictions and approval requirements.
3. *Efforts to Continually Increase Flood Protection for RD 17:* Local agencies plan to improve RD 17's levees to 200-year ULDC standards and beyond and are supporting restoration and improvement of the capacity of Paradise Cut to provide greater flood protection to downstream areas along the San Joaquin River including RD 17.
4. *Expanded rights-of-way along the landside toe of levees* are planned by RD 17 to accommodate uncertainties and future needs.
5. *Parks and open space set-asides.* RD 17 is pursuing and has in many cases secured a 50-foot setback with a single loaded street. The use of the setback area is open space or preferably a linear park.
6. *Conservation Easements.* Agreements between landowners and an agency (USFWS, etc) permanently preclude future development. San Joaquin County and the cities of Lathrop, Manteca, Stockton, Lodi, Escalon, Ripon, and Tracy have adopted the San Joaquin County Multi-Species Habitat and Conservation Plan. The SJMSCP has been approved by the U.S. Fish and Wildlife Service as a certified Habitat Conservation Plan (HCP). Habitat Conservation Plans (HCPs) provide a pathway forward to balance wildlife conservation with development. The primary objective of the HCP program is to conserve species and the ecosystems they depend on while streamlining permitting for economic development.

Provided for by the Endangered Species Act, "regional" HCPs (such as the SJMCP) are a successful conservation tool because they can anticipate, prevent, and resolve controversies and conflict associated with project-by-project permitting. They do this by addressing these issues on a large regional scale, collaboratively and over the long term.

The key purpose of the SJMSCP is to:

- Provide a strategy for balancing the need to conserve Open Space and the need to Convert Open Space to non-Open Space uses while protecting the region's agricultural economy.
- Preserve landowner property rights.
- Provide for the long-term management of plant, fish and wildlife species, especially those that are currently listed, or may be listed in the future, under the Federal Endangered Species Act (ESA) or the California Endangered Species Act (CESA).
- Provide and maintain multiple-use Open Space which contributes to the quality of life of the residents of San Joaquin County.
- Accommodate a growing population while minimizing costs to project proponents and society at large.

The *SJMSCP Planned Land Use Map* also identifies the boundaries for expected urban development and anticipated annexation areas and provides conservation strategies to offset the impacts of development. At the state and federal levels, the SJMSCP provides adequate compensation for and measures for avoiding impacts to plants, fish and wildlife for SJMSCP pursuant to the California Endangered Species Act (CESA), the California Native Plant Protection Act, the Federal Endangered Species Act (ESA), Section 404 of the Federal Clean Water Act (CWA), Section 10 of the Rivers and Harbors Act of 1899, and the Migratory Bird Treaty Act (MBTA) for listed SJMSCP Covered Bird Species also protected under the MBTA as these laws relate to the California Department of Fish and Game's (CDFG), United States Fish and Wildlife Service's (USFWS), and the U.S. Army Corps of Engineers' (USACE) responsibilities for Covered Species with respect to SJMSCP Permitted Activities located within the boundaries of San Joaquin County. Adoption and implementation of the SJMSCP by local planning jurisdictions provides adequate compensation for and minimization of impacts to plants, fish and wildlife for SJMSCP Permitted Activities as necessary to implement conservation and Open Space policies of local general plans, resolution, ordinances, and other regulations as they pertain to plants, fish and wildlife and as necessary to fulfill the obligations of local jurisdictions with respect to the analysis, minimization and mitigation of impacts to plants, fish and wildlife pursuant to the state and federal laws described above and pursuant to the California Environmental Quality Act (CEQA), and the National Environmental Policy Act (NEPA).

The SJMSCP is designed to provide 100,841 acres of Preserves based on an estimated Conversion acreage of 109,302 acres. The SJMSCP anticipates acquiring land primarily through conservation easements and fee title at a ratio of approximately 90% easements to 10% fee title acquisition. Establishment and/or use of mitigation banks, and in-lieu land dedications also will play a role in preserving habitats under the SJMSCP. The SJMSCP has over 30 preserves totally 11,883 acres of land in San Joaquin County that has been permanently protected for habitat pursuant to its program.

7. *Williamson Act agreements.* These rolling 10-year agreements between government and farmers preserve the agricultural and open space in rural California by offering landowners tax breaks on the assessed land value. There are currently 2,164 ac in Williamson Act agreements in San Joaquin County
8. *Agricultural preservation easements.* These easements keep land in agriculture in perpetuity, essentially removing development rights. San Joaquin County and the cities of Lathrop, Manteca, and Stockton have agricultural mitigation fee programs to support the work of accredited land trusts. Within RD-17, the City of Lathrop requires development to pay an agricultural preservation fee to the Central Valley Farmland Trust to offset its development impacts. The Central Valley Farmland Trust currently holds 33 agricultural conservation easements protecting nearly 13,000 acres in the San Joaquin, Sacramento, Stanislaus and Merced Counties. San Joaquin County and the City of Stockton have similar programs, and both agencies also use the Central Valley Farmlard Trust as its administrator. Stockton's program resulted in the preservation of 430 acres of prime farmland through the acquisition of conservation easements between 2007 and 2012, the initial five years of the program. During this time, the City collected almost $3 million in fees, which were transferred directly to the Trust to be used for the preservation of farmland. The County's program is very similar, but it requires that developers first attempt to acquire easements by demonstrating that a "good faith effort" was made before in-lieu fees are allowed to be paid. The County's program has been similarly successful in preserving prime farmland.
9. *Development impact fee and land purchase program.* A Development Impact Fee program is identified in the sponsor's local Finance Plan as an option to partially pay for the local share of the levee improvement program. This fee would be collected for any land developed in the benefit area, and would be dedicated to structural and non-structural flood risk reduction measures.
10. *FEMA CRS Rating.* San Joaquin County and the cities of Stockton, Lathrop, and Manteca are rated 6, 8, 8, and 9, respectively in the FEMA Community Rating System which rewards communities for advancing risk reduction programs. Ratings are on a scale of 1-10, with 1 representing the highest rating.
11. *Emergency response plan.* The San Joaquin County Office of Emergency Services coordinates emergency response planning and activities among the local

parties, and is considered one of the strongest programs in the state. It has been awarded a $1.6M grant to improve its interagency flood response planning and to increase the availability of flood fighting supplies to local levee maintaining agencies. As part of this effort, San Joaquin County recently completed Flood Safety Plans for the more than 100 miles of levees it maintains. These levees provide flood protection to much of the City of Stockton and the urbanized areas of unincorporated County in the Stockton area. Also, the County has implemented a flood alert system which provides real-time monitoring of water levels in many of the major streams and rivers that pose a flood threat to the Stockton metropolitan area. This system will be used as part of the decision-making process to deploy flood prevention and flood fighting efforts before and during major storm events.

12. *Annual flood risk notifications.* Annual flood risk notifications are mailed to all owners of levee-protected parcels by the State of California. Local agencies also communicate flood risk through a variety of regular mailings, meetings, websites and other methods. Additional public outreach on flood risk and preparedness is done in conjunction with local CRS programs.
13. *RD 17 Levee Seepage Repair Project.* RD 17 has completed Phases 1 and 2 of their levee strengthening program, and Phase 3 is expected to be under construction in 2015.

I. Development Restrictions

Various development restrictions are in place for land use authorities within the RD17 Basin at the local, state, and federal levels as summarized below. San Joaquin County and the Cities of Stockton, Lathrop, and Manteca are governed by land use related laws and regulations, many of which are designed to specifically limit the extent and intensity of growth.

Attachment Six

RECLAMATION DISTRICT NO. 17
235 East Weber Avenue (95202)
P. O. Box 1461
Stockton, California 95201
Telephone: (209) 465-5883
Facsimile: (209) 465-3956

October 27, 2014

San Joaquin Area Flood Control Agency
22 E. Weber Avenue, Suite 301
Stockton, California 95202

Attention: Roger Churchwell

Re: Lower San Joaquin River Feasibility Study
USACE Draft Plan Formulation

Dear Roger:

We object to the USACE Draft Plan Formulation and request that SJAFCA as our agent in the Lower San Joaquin River Feasibility Study also object. There are two major objections.

First. We object to the inclusion of any new levee or setback at the confluence of the San Joaquin River with Old River. At page 3-19 Alternative RD17-E includes a setback levee but no specific indication that it is the setback included in the EIR Phase III Seepage Repair Project. Additionally, the lineal footage and miles don't correlate. In the first paragraph of 3.2.5, it is stated that a small setback levee is included for potential floodplain restoration to aid in compliance with E011988 ecosystem/floodplain restorative goals. Our EIP project includes a small setback downstream of the confluence of the San Joaquin River at Old River but no setback at the confluence. This needs to be made clear in Alternative RD17-E on page 3-19 and in Alternative 9b on page 3-44 that the setback which is included is that which is in the current RD 17 EIP Phase III Seepage Repair Project.

Second. We object to the application of E.O. 11988 to any of the Alternatives for RD 17. E.O. 11988 should not be applied to Alternative 7b, 9b or any other alternative improving the existing RD 17 levees and the proposed tie back. It is now apparent that the USACE seeks through the application of E.O. 11988 to restore the natural floodplain along the San Joaquin River by rejecting otherwise feasible and cost effective projects to improve the project levees on Reclamation District No. 17.

At Page 3-57 Section 2, first paragraph, it is stated:

> "Due to the urbanization, there are few opportunities for restoration of the natural floodplain in the study area except for the reach of the mainstream San Joaquin River adjacent to RD 17."

In Section 2, third paragraph, it is stated:

> "Due to development on the landside of the levee system, there is little leeway for restoration of natural floodplain functionality and values other than in the RD 17 undeveloped area. This may mean that for a majority of the study area excluding RD 17, opportunities for floodplain restoration are foregone and enhancement of remaining floodplain and riparian habitat areas will be limited."

These statements are not only false but represent a deliberate attempt to mislead reviewers to preclude the objective review of the feasibility of flood control projects to protect the over 40,000 residents and billions of dollars of public and private property in RD 17. There are, of course, many miles of land along the San Joaquin River which do not abut urban development, some of which is directly across the river from RD 17. There are also numerous areas outside the leveed areas along Rd 17 as well as upstream and downstream which could be improved to provide additional habitat. There is also a significant opportunity to improve the floodplain values in connection with Paradise Cut which is a bypass reconstructed by the USACE but not performing as designed. Improvement of the habitat in portions of Paradise Cut is part of an ongoing development and additions are being considered by the State and locals.

UNLAWFUL ATTEMPT BY THE USACE TO USE A MISAPPLICATION OF E011988 TO CIRCUMVENT THE LAWS OF CONGRESS

In 1850 Congress adopted the Arkansas Act of 1850 sometimes referred to as the Swamp Land Act of 1850 to aid the States in reclaiming swamp and overflowed lands. By way of such Act, such lands were conveyed to the State of California in consideration of the duty of the State to make and maintain the necessary improvements for such reclamation. In the case of *Kimball v. Reclamation Fund Commissioners (1873) 45 Cal.344, 360* the California Supreme Court found:

"The object of the Federal Government in making this munificent donation to the severed States was to promote the speedy reclamation of the lands and thus invite to them population and settlement, thereby opening new fields for industry and increasing the general prosperity." (Emphasis added.)

The area along the river for which the USACE seeks to cause the reversion to an unreclaimed flood plain consists of swamp and overflowed land conveyed in 1850 to the State for reclamation and development. Reclamation and development certainly commenced shortly after 1850. Reclamation District No. 17, one of the oldest reclamation districts in California was formed in 1863 and the levees along the San Joaquin River have been in place for more than 100 years. The land along the river is not undeveloped but consists of highly developed farmland, multiple residences and some commercial structures dating back to the 1800's.

The Lower San Joaquin River and Tributaries Project, of which the Lower San Joaquin River Levee Project is a unit, was authorized by the Flood Control Act of 22 December 1944, Public Law 534, 78th Congress, 2nd Session, Section 10. Included in the Project were the RD 17 levees along the left bank of French Camp Slough, those along the right back of the San Joaquin River and those along the right bank of Walthall Slough. Commencing in 1944, work on various portions of the RD 17 levees was carried out by the U.S. Army Corps of Engineers. The Standard Operation and Maintenance Manual for the Lower San Joaquin River Levees Project (prepared by the Sacramento District Corps of Engineers, U. S. Army, Sacramento, California, dated April, 1959) provides that the project includes construction or reconstruction of levees, channel improvement and the provision for bank protection along the Lower San Joaquin River from the mouth of the Merced River to the Delta, terminating at the Stockton Deep Water Ship Channel.

"1.04. Protection Provided. The Lower San Joaquin River and Tributaries Project, including the levee and channel work of the Lower San Joaquin River Levees Project, when completed, will provide protection from all floods of record to about 120,000 acres of fertile agricultural lands; to a suburban area south of the City of Stockton and about four small communities; to other areas developed for residential and industrial purposes; to two transcontinental highway and other State and County highways. It will make possible the reclamation of areas that can be developed to a higher degree when protection against flood hazard is assured." (Emphasis added.)

In May 1963, the U. S. Army Corps of Engineers issued "Supplement to Standard Operation and Maintenance Manual Lower San Joaquin River and Tributaries Project Unit No. 2 Right Bank Levee of San Joaquin River and Left Bank of French Camp Slough Within Reclamation District No. 17."

"1.03. Protection Provided. Levees along the left bank of French Camp Slough and right bank of San Joaquin River, as described in this unit, provide direct protection to about 12,000 acres of agricultural, industrial and residential lands within Reclamation District No. 17. Along French Camp Slough the grade of the adopted flood plane profile is level at elevation 11.0 from the San Joaquin River to the French Camp Turnpike. Along the right bank of the San Joaquin River, the grade of the adopted flood plane profile varies from elevation 11.0 at French Camp Slough to elevation 23.5 at Walthall Slough. All elevations are referred to mean seal level datum (1929) adjustment. Levee grades within this unit provide for a freeboard of at least 3 feet above the adopted flood plane profile. Within this unit, the project design flood for French Camp Slough is 3,000 cubic feet per second and for the San Joaquin River about 18,000 cubit feet per second from French Camp Slough to Old River and 37,000 cubic feet per second from Old River to Walthall. The flow in French Camp slough coincidental with the San Joaquin River design flood would be about 2,000 cubic feet per second." (Emphasis added.)

The supplement references work on the RD 17 levees commencing in January of 1944 and extending through January 1963.

On January 3, 1963, The Reclamation Board of the State of California accepted for Operation and Maintenance bank protection, levee enlargement, and access and patrol road construction, right and left banks, San Joaquin River from Head Old River to Stockton Deep Water Channel and other work.

The USACE actions to undo the reclamation of the RD 17 lands along the river is directly contrary to the clear intent and purpose of the Swampland Act of 1850 and the authorization and construction of the Lower San Joaquin River and Tributaries Project Unit No. 1 and Unit No. 2 which was to foster the very reclamation and development which the USACE is trying to reverse and obstruct.

Executive orders cannot change federal law. Congress has not changed the objectives of the Swampland Act of 1850 or the objectives of the Lower San Joaquin River and Tributaries Project.

Public and private investments have been made and thousands of people have located in RD 17 due to and in furtherance of the intent of Congress.

THE USACE CURRENT ACTIONS ARE INCONSISTENT WITH ITS PREVIOUS INTERPRETATION OF E.O. 11988 RELATING TO DEVELOPMENT IN RD 17

E.O. 11988 was adopted in about 1978.

During the period of about 1988-1990 in connection with the permitting of the Weston Ranch residential development in the City of Stockton, the levees of RD 17 were improved to meet the FEMA requirements for urban development. FEMA accreditation was issued on February 2, 1990. The work necessary to bring the levee system up to the FEMA standards was approved by all regulatory agencies including the Corps of Engineers. Application for such work was submitted by RD 17 to the Corps on or about June 12, 1988. The work included clearing, placement of engineered fill, utility relocation, placement of gravel patrol road and placement of bank protection. The application was supported by EIR Sch #87020305 certified by the City of Stockton on January 25, 1988, hydraulic study by Gil and Pulver and a formal Endangered Species Consultation. The impacts of removal of the RD 17 area from the FEMA floodplain restrictions were addressed in the EIR and hydraulic study. In about June of 1989, the Corps issued its Permit No. 9957 for the work determined by them as requiring such a permit. A similar application submitted to The Reclamation Board of the State of California resulted in their approval. Additionally, The Reclamation Board performed ongoing inspection and certification of the work.

During the January 1997 floodfight, seepage and boils occurred at a number of locations along the RD 17 levees. The Corps, DWR and RD 17 actively and successfully addressed the seepage and boils. There were no failures in the RD 17 levees. Subsequently, the Corps, The Reclamation Board and RD 17 undertook a project to repair the seepage and boil areas along the RD 17 levees. The Corps designed and constructed the project. DWR reviewed the design. In October of 2004, the Corps notified The Reclamation Board ·

> "In October 2001, the U.S. Army Corps of Engineers (Corps) completed a portion of work for the Lower San Joaquin River and Tributaries Project, California. The features constructed under this contract included requirements associated with the rehabilitation of "Unit No. 2" along the right bank levee of San Joaquin River within Reclamation District (RD) No. 17. In order to ensure the work transferred meets the specific requirements of the project objectives as well as the requirements of the non-Federal sponsor, the Corps requests a review of the enclosed 'Addendum to Standard Operation and Maintenance Manual, Lower San Joaquin River and Tributaries Project, California, Unit No. 2, Right Bank Levee of the San Joaquin River and Left Bank of French Camp Slough Within Reclamation District No. 17'."

The Addendum reflects that the State of California Reclamation Board officially accepted responsibility for operating and maintaining the construction completed in 2001 under Contract No. DACW05-00-C-0033 through a letter dated July 18, 2003.

No objection based on E.O. 11988 was raised by the USACE until the present. E.O. 11988 does not appear to have been changed by the President and it is the USACE that is unilaterally changing the interpretation of the Executive Order so as to conflict with federal law. Such action would appear to be both arbitrary and contrary to law.

The current project being considered for RD 17 is not a new project such that natural or undeveloped floodplain would be impacted but in reality is simply an improvement of the Lower San Joaquin River and Tributaries Project which was intended to protect against the highest flood of record.

THE USACE'S FAILURE TO DESIGN AND CONSTRUCT THE RD 17 LEVEES TO CONFORM TO ITS OWN SEEPAGE REQUIREMENTS IS NOW BEING CITED AS THE BASIS FOR THE OBSTRUCTION TO IMPROVEMENT OF RD 17 LEVEES AND JUSTIFICATION FOR SEEKING TO UNDO THE RECLAMATION OF RD 17 LANDS IN VIOLATION OF FEDERAL LAW

At page 3-54 of the Plan, it is stated:

> "For the purpose of this analysis and the current study, Sacramento District has defined the base floodplain using the risk and uncertainty assurance values for the existing levees. Current levee conditions result in assurance values less than 90% for the one percent chance event due to underseepage issues, so the District has delineated the base floodplain assuming the levees were not in place. This results in the entirety of the study area falling within the base floodplain and subject to compliance with E.O. 11988. From the Federal Emergency Management Agency perspective, if levees meet 90 to 95% assurance or higher and are accredited, the base floodplain ends at the landside toe of the levee, and the area behind the levee is assigned a Zone X designation under the National Flood Insurance Program (NFIP). FEMA did not use the Corps' risk and uncertainty assurance values when accrediting RD 17 levees."

Of course, FEMA did not use the Corps' risk and uncertainty assurance values when accrediting RD 17 levees as such were not part of the criteria for accreditation.

The Corps designed and constructed the project levee improvements to the RD 17 levees during the period of 1944-1963. They apparently did not "provide protection from all floods of record "and the very claimed deficiencies which are cited by the Corps are due to their failures in design and construction." The levees along the San Joaquin River are in the same location as when improvements to project standards were completed by 1963 and they have been substantially improved.

After the 1997 high water event, the Corps carried out a project together with the State and RD 17 to repair the seepage and boil areas along the RD 17 levees. RD 17 successfully and with great effort conducted an assessment ballot proceeding to raise the money for its local share.

The Corps designed and constructed the project including all measures to address the seepage and boils. The Addendum to the Operation and Maintenance Manual prepared by the Corps provides:

"2-05. Berms.

a. Description. The berms construction in 2001 under Contract No. DACW05-00-C-0033 are located along the landside slope of the existing levee. This construction contract included the installation of a berm at 21 separate sites between L.M. 0.98 and L.M. 13.08 of Unit No. 2. A berm is generally constructed to satisfy one or both of the following objectives: 1) Stability - Compacted fill is placed along the toe and slope of the levee as a buttress to stabilize the levee against sloughing or rotational slipping; or, 2) Seepage - Fill is placed over a layer of pervious drainage material or other drainage feature as a counterweight to uplift pressures associated with heavy seepage or boils. The height, width, cross-slope, and side-slope of each berm varies based on which objective it has been designed to satisfy. For information specific to any one of the berms constructed in 2001, refer to the attached Project Information Form, EXHIBIT A-2, or the As-Built Drawings, EXHIBIT B. In general, all berms should be operated in maintained in accordance with the principles that govern the operation and maintenance of a levee.

b. For pertinent Requirements of the Code of Federal Regulations and other requirements, see the following:

(1) Sand Boils paragraph 8-09 of the standard Manual.

(2) Sub-levees or Bow Levees paragraph 8-10 of the Standard Manual."

(emphasis added)

Subsequent to 2001 substantial development has taken place within RD 17 and in the City of Lathrop developers have been required to install toe drains landward of the levee to intercept seepage. All work on the RD 17 levees since the Corps Project Levee Construction in 1963 including the improvements to meet FEMA accreditation requirements in 1990 has increased the ability of the levee system to address seepage and boil concerns.

The criteria presently used by the Corps to justify its unlawful attempt to reverse the reclamation of the RD 17 lands along the San Joaquin River was not used by the Corps in the construction of the project levees and not even used in the project to repair the seepage and boils which was completed in 2001.

The Corps' misguided use of its underseepage analysis to support its floodplain argument also ignores the EIP seepage repair project which is now being carried out by DWR and RD 17. Funding is in place to complete the project and any consideration of seepage should account for such project.

THE STATE AGREEMENT TO SERVE AS THE NON-FEDERAL SPONSOR OF AND THE RD 17 AGREEMENT WITH THE STATE TO OPERATE AND MAINTAIN THE PROJECT LEVEES WERE BASED UPON THE CLEAR INTENT AND PURPOSE AS EXPRESSED IN THE SWAMPLAND ACT OF 1850 AND THE LOWER SAN JOAQUIN RIVER AND TRIBUTARIES PROJECT TO PERPETUALLY OPERATE AND MAINTAIN THE PROJECT LEVEES TO FOSTER DEVELOPMENT AND THE ECONOMY.

The actions of the USACE constitute a unilateral interference with the contracts and intentions of the State, RD 17 and the United States.

The safety of thousands of people, their livelihoods and homes and billions of dollars of public and private investment are being jeopardized by the arbitrary, capricious and unlawful actions of the Corps.

THE USACE ACTIONS ARE AN UNFAIR AFTER-THE-FACT ATTEMPT TO CHANGE LAND USE PLANS WHICH WERE BASED ON FEMA ACCREDITATION AND CORPS APPROVAL IN 1990.

The General Plans of the land use agencies have been in place for a number of years and are not being induced by reason of the feasibility study projects. Even the State SB-5 requirements to provide a 200-year level of protection for residential and some other types of developments do not require the reversal of the reclamation of the RD 17 lands.

Changes in engineering analysis and creation of loosely defined rules of risk and uncertainty should not be used as a basis for total disruption and probable destruction of major communities by after-the-fact determinations.

The solution is to upgrade the levees to provide the additional desired protection.

THE RISK AND UNCERTAINTY ANALYSIS BY THE CORPS DOES NOT APPEAR TO ADEQUATELY ACCOUNT FOR THE HEALTH AND SAFETY OR IMPACT ON THE CAPABILITY OF COMMUNITIES TO REMAIN VIABLE.

The risk and uncertainty analysis for RD 17 should not be approved. The methods and application must be carefully reviewed by the local technical representatives. The result of leaving 40,000 plus people and billions of dollars of public and private investment including two major highways, the County Hospital and Jail and multiple schools inadequately protected is unjustifiable.

CONCLUSION

We respectfully request that the Draft Plan Formulation be rejected.

Yours very truly,

DANTE JOHN NOMELLINI
Secretary and Counsel

DJN:ju

RECLAMATION DISTRICT NO. 17
235 East Weber Avenue (95202)
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Stockton, California 95201
Telephone: (209) 465-5883
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April 8, 2015

Via Email: tyler.m.stalker@usace.army.mil

Tyler Stalker
U.S. Army Corps, Corps of Engineers
1325 J Street, Rm. 1513
Sacramento, CA 95814

Re: Lower San Joaquin River, CA Draft Feasibility Report / Environment Impact Statement / Environment Impact Report - February 2015

Dear Mr. Stalker:

Reclamation District No. 17 which was founded in 1863 operates and maintains about 19 miles of levee extending along the right bank of the San Joaquin River, the left bank of French Camp Slough and the right bank of Walthal Slough. Of the 19 miles, 16.18 miles are project levees for which construction was completed by the USACE in about 1963.

Denial of Improved Flood Protection to 43,600 Residents and Billions of Dollars of Public and Private Investment is Unjust and Unlawful and will Increase the Risk of Loss of Human Life and Personal Health and Safety.

Your determination that there is no federal interest in providing needed flood protection for the 43,600 residents, two major highways, two major railroads, County hospital, County sheriff and jail complex, children center, multiple schools, police and fire facilities, City Hall and other public and private improvements, etc. is unjust and unlawful. Your analysis does not comply with your own guidelines and is predecisional in the NEPA process. (See DEIS/EIR pages 3-64 to 3-67 which are attached). Your actions interfere with the contractual relations as to operational maintenance of the project levees and the Corps responsibility to correct deficiencies in the design and construction related thereto.

Your actions have wrongfully created a stigma on the communities within RD 17 and create a physical division in our community between those areas which will be provided with increased flood protection and those which will not.

The prejudice and risk created by your discriminatory treatment of the areas within RD 17 will diminish the value of the homes of 43,600 residents and the other public and private investments. Future public and private investments and the economic survival of the area will be jeopardized.

Two of the highest disadvantaged census tracts in the State of California are located within RD 17 and will be unjustly impacted by your action (Attached are Disadvantaged Community Maps and information for census tracts 6077003803 and 6077005119).

The Area protected by the RD 17 Levees is not Flood Plain. The Area was Fully Reclaimed from the Natural Flood Plain Prior to 1863.

The area although at some level of risk of flooding has levees which have been substantially and continually improved. The USACE completed the project levee improvements in about 1963 and additional privately funded improvements were completed by 1990 to meet FEMA standards. The flood protection has since 1990 met the FEMA requirements for urban development.

In 1850 Congress adopted the Arkansas Act of 1850 sometimes referred to as the Swamp Land Act of 1850 to aid the States in reclaiming swamp and overflowed lands. By way of such Act, such lands were conveyed to the State of California in consideration of the duty of the State to make and maintain the necessary improvements for such reclamation. In the case of *Kimball v. Reclamation Fund Commissioners (1873) 45 Cal.344, 360* the California Supreme Court found:

> "The object of the Federal Government in making this munificent donation to the several States was to promote the speedy reclamation of the lands and thus <u>invite to them population and settlement</u>, thereby opening new fields for industry and increasing the general prosperity." (Emphasis added.)

The area along the river for which the USACE seeks to treat as an unreclaimed flood plain consists of swamp and overflowed land conveyed in 1850 to the State for reclamation and development. Reclamation and development certainly commenced shortly after 1850. Reclamation District No. 17, one of the oldest reclamation districts in California was formed in 1863 and the levees along the San Joaquin River have been in place for more than 100 years.

The land along the river is not undeveloped but consists of highly developed farmland, multiple residences and some commercial structures dating back to the 1800's.

The Lower San Joaquin River and Tributaries Project, of which the Lower San Joaquin River Levee Project is a unit, was authorized by the Flood Control Act of 22 December 1944, Public Law 534, 78th Congress, 2nd Session, Section 10. Included in the Project were the RD 17 levees along the left bank of French Camp Slough, those along the right bank of the San Joaquin River and those along the right bank of Walthall Slough. Commencing in 1944, work on various portions of the RD 17 levees was carried out by the U.S. Army Corps of Engineers. The Standard Operation and Maintenance Manual for the Lower San Joaquin River Levees Project (prepared by the Sacramento District Corps of Engineers, U. S. Army, Sacramento, California, dated April, 1959) provides that the project includes construction or reconstruction of levees, channel improvement and the provision for bank protection along the Lower San Joaquin River from the mouth of the Merced River to the Delta, terminating at the Stockton Deep Water Ship Channel.

> "1.04. Protection Provided. The Lower San Joaquin River and Tributaries Project, including the levee and channel work of the Lower San Joaquin River Levees Project, when completed, will provide protection from all floods of record to about 120,000 acres of fertile agricultural lands; to a suburban area south of the City of Stockton and about four small communities; to other areas developed for residential and industrial purposes; to two transcontinental highways and other State and County highways. It will make possible the reclamation of areas that can be developed to a higher degree when protection against flood hazard is assured." (Emphasis added.)

In May 1963, the U. S. Army Corps of Engineers issued "Supplement to Standard Operation and Maintenance Manual Lower San Joaquin River and Tributaries Project Unit No. 2 Right Bank Levee of San Joaquin River and Left Bank of French Camp Slough Within Reclamation District No. 17."

> "1.03. Protection Provided. Levees along the left bank of French Camp Slough and right bank of San Joaquin River, as described in this unit, provide direct protection to about 12,000 acres of agricultural, industrial and residential lands within Reclamation District No. 17. Along French Camp Slough the grade of the adopted flood plane profile is level at elevation 11.0 from the San Joaquin River to the French Camp Turnpike. Along the right bank of the San Joaquin River, the grade of the adopted flood plane profile varies from elevation 11.0 at French Camp Slough to elevation 23.5 at Walthall Slough. All elevations are referred to mean seal level datum (1929) adjustment. Levee grades within this

unit provide for a freeboard of at least 3 feet above the adopted flood plane profile. Within this unit, the project design flood for French Camp Slough is 3,000 cubic feet per second and for the San Joaquin River about 18,000 cubic feet per second from French Camp Slough to Old River and 37,000 cubic feet per second from Old River to Walthall. The flow in French Camp slough coincidental with the San Joaquin River design flood would be about 2,000 cubic feet per second." (Emphasis added.)

The supplement references work on the RD 17 levees commencing in January of 1944 and extending through January 1963.

On January 3, 1963, The Reclamation Board of the State of California accepted for Operation and Maintenance bank protection, levee enlargement, and access and patrol road construction, right and left banks, San Joaquin River from Head Old River to Stockton Deep Water Channel and other work.

The USACE actions to undo the reclamation of the RD 17 lands along the river is directly contrary to the clear intent and purpose of the Swampland Act of 1850 and the authorization and construction of the Lower San Joaquin River and Tributaries Project Unit No. 1 and Unit No. 2 which was to foster the very reclamation and development which the USACE is trying to reverse and obstruct.

Executive orders cannot change federal law. Congress has not changed the objectives of the Swampland Act of 1850 or the objectives of the Lower San Joaquin River and Tributaries Project.

Public and private investments have been made and thousands of people have located in RD 17 due to and in furtherance of the intent of Congress.

THE USACE CURRENT ACTIONS ARE INCONSISTENT WITH ITS PREVIOUS INTERPRETATION OF E.O. 11988 RELATING TO DEVELOPMENT IN RD 17

E.O. 11988 was adopted in about 1978. During the period of about 1988-1990 in connection with the permitting of the Weston Ranch residential development in the City of Stockton, the levees of RD 17 were improved to meet the FEMA requirements for urban development. FEMA accreditation was issued on February 2, 1990. The work necessary to bring the levee system up to the FEMA standards was approved by all regulatory agencies including the Corps of Engineers. Application for such work was submitted by RD 17 to the Corps on or about June 12, 1988. The work included clearing, placement of engineered fill, utility relocation, placement of gravel patrol road and placement of bank protection. The application was supported by EIR Sch #87020305 certified by the City of Stockton on January 25, 1988, hydraulic study by Gil and Pulver and a formal Endangered Species Consultation. The impacts of removal of the RD 17 area from the FEMA floodplain restrictions were addressed in the EIR and hydraulic study. In about June of 1989, the Corps issued its Permit No. 9957 for the work determined by them as requiring such a permit. A similar application submitted to The Reclamation Board of the State of California resulted in their approval. Additionally, The Reclamation Board performed ongoing inspection and certification of the work.

During the January 1997 high water event, seepage and boils occurred at a number of locations along the RD 17 levees. The Corps, DWR and RD 17 actively and successfully addressed the seepage and boils. There were no failures in the RD 17 levees. Subsequently, the Corps, The Reclamation Board and RD 17 undertook a project to repair the seepage and boil areas along the RD 17 levees. The Corps designed and constructed the project. DWR reviewed the design. In October of 2004, the Corps notified The Reclamation Board

> "In October 2001, the U.S. Army Corps of Engineers (Corps) completed a portion of work for the Lower San Joaquin River and Tributaries Project, California. The features constructed under this contract included requirements associated with the rehabilitation of "Unit No. 2" along the right bank levee of the San Joaquin River within Reclamation District (RD) No. 17. In order to ensure the work transferred meets the specific requirements of the project objectives as well as the requirements of the non-Federal sponsor, the Corps requests a review of the enclosed 'Addendum to Standard Operation and Maintenance Manual, Lower San Joaquin River and Tributaries Project, California, Unit No. 2, Right Bank Levee of the San Joaquin River and Left Bank of French Camp Slough Within Reclamation District No. 17'."

The Addendum reflects that the State of California Reclamation Board officially accepted responsibility for operating and maintaining the construction completed in 2001 under Contract No. DACW05-00-C-0033 through a letter dated July 18, 2003.

No objection based on E.O. 11988 was raised by the USACE until the present. E.O. 11988 does not appear to have been changed by the President and it is the USACE that is unilaterally changing the interpretation of the Executive Order so as to conflict with federal law. Such action would appear to be both arbitrary and contrary to law.

The current feasibility study alternatives for RD 17 would not be a new project such that natural or undeveloped flood plain would be impacted but in reality would simply be an improvement of the 1944 Lower San Joaquin River and Tributaries Project which was intended to protect against the highest flood of record and foster development.

THE USACE'S FAILURE TO DESIGN AND CONSTRUCT THE RD 17 LEVEES TO CONFORM TO ITS OWN SEEPAGE REQUIREMENTS IS THE BASIS FOR THE CORPS DETERMINATION THAT RD 17 IS IN THE BASE FLOOD PLAIN AND THE REJECTION OF FEDERAL ASSISTANCE FOR IMPROVEMENT OF RD 17 LEVEES

At page 3-53 of the DEIS/EIR, it is stated:

The overall purpose of the project is to reduce flood risk to urban and urbanizing parts of the study area. The final array of alternatives involve improving levees or constructing new levees located in the base 1% (1/100) annual chance exceedance (ACE) flood plain. For the purpose of this study, the base flood plain is delineated as all areas that are at risk of being flooded by the 1/100 ACE flow. In other words, the base flood plain has been delineated assuming existing levees do not provide protection from the 1/100 ACE event. This is because this definition of the base flood plain addresses the USACE requirement in Engineer Regulation 1105-2-101 to describe a project's performance using risk and uncertainty methods and for purposes of studies 1105-2-101 does not require USACE to give deference to the current accreditation for RD17's levee system provided by the Federal Emergency Management Agency in 2011. For this reason, the entire study area was evaluated for E.O. 11988 compliance.

The bases for the Corp's determination that RD 17 is within the base flood plain are seepage concerns which were not addressed by the Corps in construction of the project levees completed in 1963 and not addressed in the seepage repairs completed in 2001.

The Corps designed and constructed the project levee improvements to the RD 17 levees during the period of 1944-1963. They apparently did not "provide protection from all floods of record "and the very claimed deficiencies which are cited by the Corps are due to their failures in design and construction." The levees along the San Joaquin River are in the same location as when improvements to project standards were completed by 1963 and they have been substantially improved.

After the 1997 high water event, the Corps carried out a project together with the State and RD 17 to repair the seepage and boil areas along the RD 17 levees. RD 17 successfully and with great effort conducted an assessment ballot proceeding to raise the money for its local share.

The Corps designed and constructed the project including all measures to address the seepage and boils. The Addendum to the Operation and Maintenance Manual prepared by the Corps provides:

"2-05. Berms.

a. Description. The berms construction in 2001 under Contract No. DACW05-00-C-0033 are located along the landside slope of the existing levee.

This construction contract included the installation of a berm at 21 separate sites between L.M. 0.98 and L.M. 13.08 of Unit No. 2. A berm is generally constructed to satisfy one or both of the following objectives: 1) Stability - Compacted fill is placed along the toe and slope of the levee as a buttress to stabilize the levee against sloughing or rotational slipping; or, 2) Seepage - Fill is placed over a layer of pervious drainage material or other drainage feature as a counterweight to uplift pressures associated with heavy seepage or boils. The height, width, cross-slope, and side-slope of each berm varies based on which objective it has been designed to satisfy. For information specific to any one of the berms constructed in 2001, refer to the attached Project Information Form, EXHIBIT A-2, or the As-Built Drawings, EXHIBIT B. In general, all berms should be operated and maintained in accordance with the principles that govern the operation and maintenance of a levee.

b. For pertinent Requirements of the Code of Federal Regulations and other requirements, see the following:

(1) Sand Boils paragraph 8-09 of the standard Manual.

(2) Sub-levees or Bow Levees paragraph 8-10 of the Standard Manual."

(emphasis added)

Subsequent to 2001 substantial development has taken place within RD 17 and in the City of Lathrop developers have been required to install toe drains landward of the levee to intercept seepage. All work on the RD 17 levees since the Corps Project Levee Construction in 1963 including the improvements to meet FEMA accreditation requirements in 1990 has increased the ability of the levee system to address seepage and boil concerns.

The criteria presently used by the Corps to justify its unlawful attempt to reverse the reclamation of the RD 17 lands along the San Joaquin River was not used by the Corps in the construction of the project levees and not even used in the project to repair the seepage and boils which was completed in 2001.

The Corps' misguided use of its underseepage analysis to support its floodplain argument also ignores the EIP seepage repair project which is now being carried out by DWR and RD 17. Funding is in place to complete the project and any consideration of seepage should account for such project.

THE STATE AGREEMENT TO SERVE AS THE NON-FEDERAL SPONSOR OF AND THE RD 17 AGREEMENT WITH THE STATE TO OPERATE AND MAINTAIN THE PROJECT LEVEES WERE BASED UPON THE CLEAR INTENT AND PURPOSE

AS EXPRESSED IN THE SWAMPLAND ACT OF 1850 AND THE LOWER SAN JOAQUIN RIVER AND TRIBUTARIES PROJECT TO PERPETUALLY OPERATE AND MAINTAIN THE PROJECT LEVEES TO FOSTER DEVELOPMENT AND THE ECONOMY.

The actions of the USACE constitute a unilateral interference with the contracts and intentions of the State, RD 17 and the United States.

The safety of thousands of people, their livelihoods and homes and billions of dollars of public and private investment are being jeopardized by the arbitrary, capricious and unlawful actions of the Corps.

THE USACE ACTIONS ARE AN UNFAIR AFTER-THE-FACT ATTEMPT TO CHANGE LAND USE PLANS WHICH WERE BASED ON FEMA ACCREDITATION AND CORPS APPROVAL IN 1990.

The General Plans of the land use agencies have been in place for a number of years and are not being induced by reason of the feasibility study projects. Even the State SB-5 requirements to provide a 200-year level of protection for residential and some other types of developments do not require the reversal of the reclamation of the RD 17 lands.

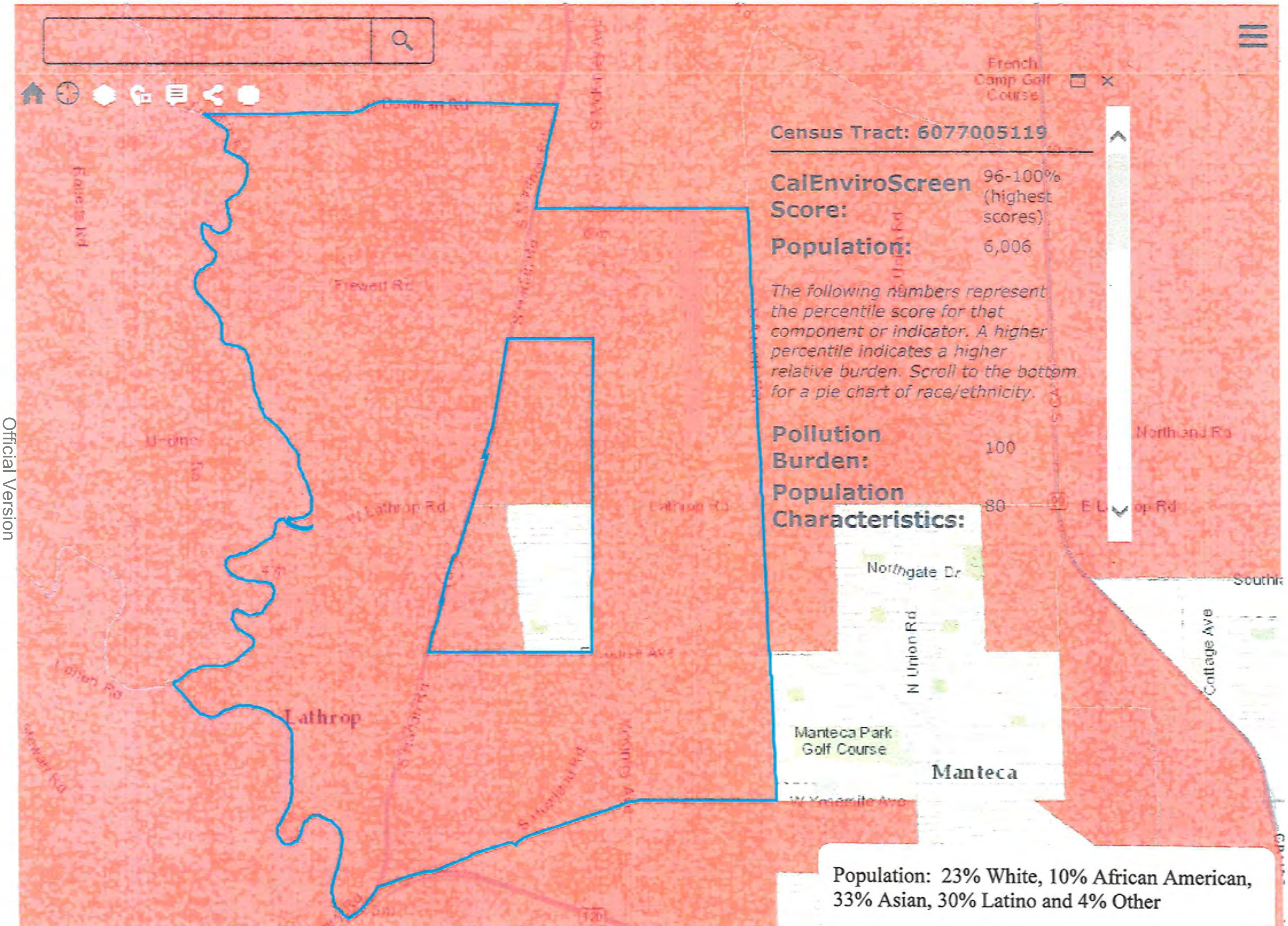
Changes in engineering analysis and creation of loosely defined rules of risk and uncertainty should not be used as a basis for total disruption and probable destruction of major communities by after-the-fact determinations.

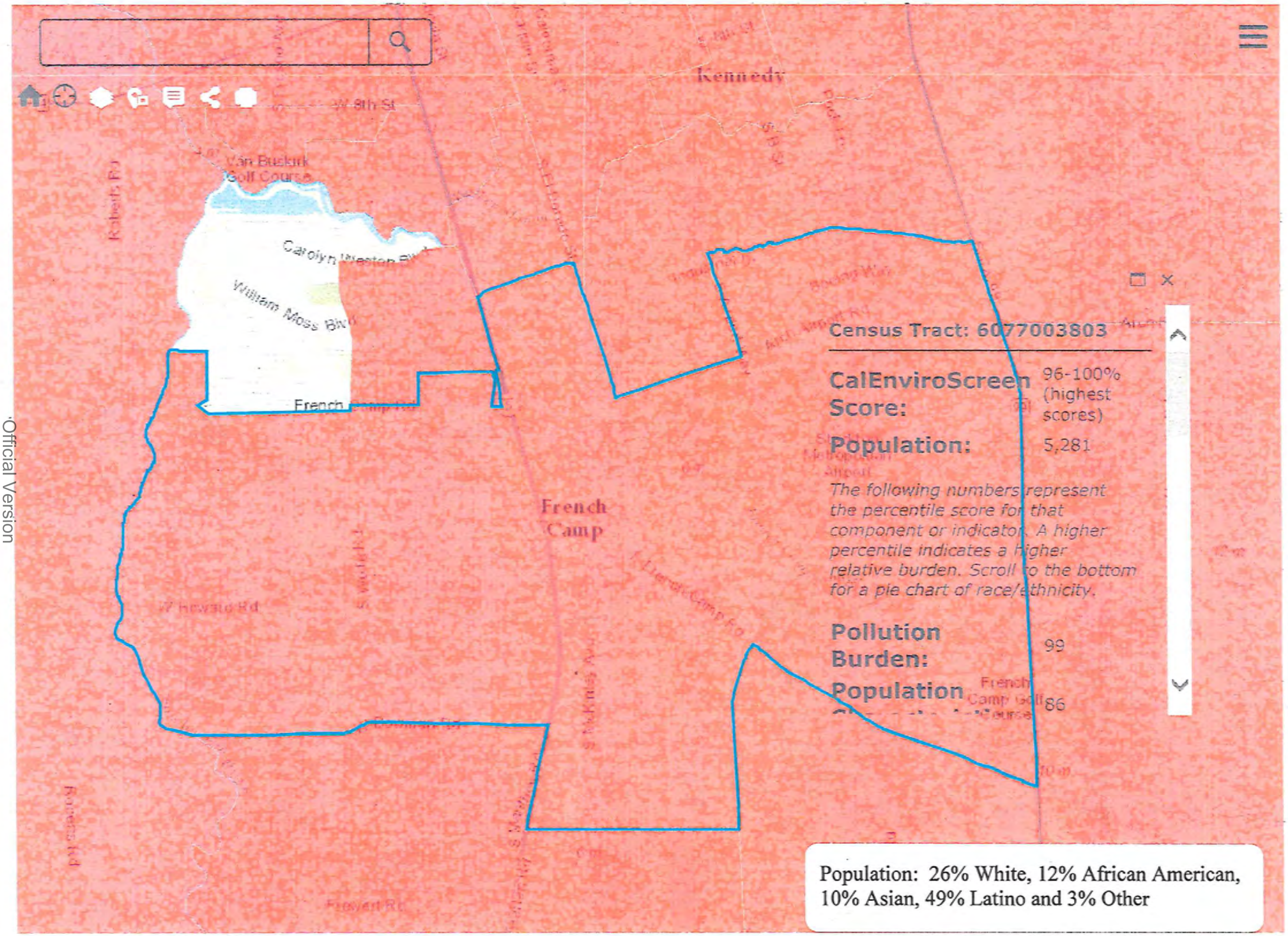
We request that the RD17 alternatives without the setback along the San Joaquin River be included for complete analysis in the current feasibility study and that reanalysis be conducted impartially and in compliance with law.

Yours very truly,

Dante John Nomellini
Reclamation District No. 17

This is part one of our comments. Part two will be submitted by the April 13, 2015 deadline.


Census Tract: 6077005119
CalEnviroScreen Score: 96-100% (highest scores)
Population: 6,006
The following numbers represent the percentile score for that component or indicator. A higher percentile indicates a higher relative burden. Scroll to the bottom for a pie chart of race/ethnicity.
Pollution Burden: 100
Population Characteristics: 80
Population: 23% White, 10% African American, 33% Asian, 30% Latino and 4% Other
French Camp Golf Course
Lathrop
Manteca
Manteca Park Golf Course
Northgate Dr
N Union Rd
Cottage Ave
Frewert Rd
W Lathrop Rd
Lathrop Rd
Northland Rd
W Yosemite Ave



Population: 26% White, 12% African American, 10% Asian, 49% Latino and 3% Other

6. As part of the planning process under the Principles and Guidelines, determine viable methods to minimize any adverse impact of the action including any likely induced development for which there is no practicable alternative and methods to restore and preserve the natural and beneficial flood plain values. This should include reevaluation of the "no action" alternative.

As discussed, the historic placement of levees in the study area precludes opportunities for restoration or enhancement of natural flood plain values.

Evaluation of the alternatives which included RD 17 with respect to development and minimization of adverse impacts caused USACE to reevaluate the final array of alternatives. Based on existing land use planning further inducing development in RD 17 in the deepest parts of the flood plain (highest life-safety consequence), the decision was made to remove the RD 17 alternatives from further consideration in this draft feasibility study (Alternatives 7b, 8b, and 9b). The Principles and Guidelines state that Federal investments in water resources should avoid the unwise use of flood plains and flood-prone areas and minimize adverse impacts and vulnerabilities in any case in which a flood plain or flood-prone area must be used. While few practicable alternatives to development in the flood plain were identified, it was determined that the proposed development, as shown in the General Plans, is unwise from the perspective of supporting Federal investment for a flood risk reduction project.

7. If the final determination is made that no practicable alternative exists to locating the action in the flood plain, advise the general public in the affected area of the findings.

The public will have an opportunity to comment on this analysis and determination when the Draft Integrated Feasibility Report/EIS/EIR is released for concurrent public, resource agency, independent external peer and USACE technical, policy and legal reviews.

8. Recommend the plan most responsive to the planning objectives established by the study and consistent with the requirements of the Executive Order.

Existing Project levees were historically placed in close proximity to the river channels, reducing the extent of natural flood plain within the study area. Existing infrastructure, such as transportation routes, housing, agricultural improvements, levees and drains, limits the potential for restoration of the San Joaquin River natural hydrology and ecosystem functions. The North and Central Stockton alternatives have little or no unmitigated adverse effects due to the fully developed nature of the North and Central Stockton areas. The proposed placement of development within the RD 17 basin is in the deepest part of the flood plain (highest life-safety consequence).

The RD 17 alternatives are removed from consideration based on the Principles and Guidelines which state that Federal investments in water resources should avoid the unwise use of flood plains and flood-prone areas and minimize adverse impacts and vulnerabilities in any case in which a flood plain or flood-prone area must be used. The remaining alternatives (Alternatives 7a, 8a, and 9a) have little or no unmitigated adverse effects due to the fully developed nature of the North and Central Stockton areas.

Critical Actions. Repeat steps 1 through 8 above for critical actions in the critical action flood plain for the full range of potential residual flood risks. The critical action flood plain is defined as the 500-year flood plain (0.2 percent chance flood plain).

1. Determine if the proposed action is in the critical action flood plain.

The critical action flood plain (500-year flood plain) consists of the entire study area delineated in Figure 1-3. Proposed actions being analyzed by this study are within the critical action flood plain.

2. If the action is in the critical action flood plain, identify and evaluate practicable alternatives to the action or to location of the action in the base flood plain.

There are no practicable alternatives to the proposed actions being situated within the critical action flood plain. See Base Flood Plain Step 2.

3. If the action must be in the critical action flood plain, advise the general public in the affected area and obtain their views and comments.

See Base Flood Plain Step 3.

4. Identify beneficial and adverse impacts due to the action and any expected losses of natural and beneficial flood plain values. Where actions proposed to be located outside the 0.2% flood plain will affect the 0.2% flood plain, impacts resulting from these actions should also be identified.

The critical infrastructure currently located in the critical action flood plain includes 2 major inter-state and international highways (I-5, CSR-99), 4 hospitals, 9 fire stations, 8 police stations, 3 railroads, wastewater treatment plant, and an airport and currently consists of the developed portions of the Cities of Stockton, Lathrop and Manteca. There are no liquefied natural gas terminals and facilities producing and storing highly volatile, toxic or water-reactive materials in the study area. Current population at risk is approximately 235,047 within the 0.2% ACE (500-year) natural flood plain and economic damages as defined by damageable property amount to $21 billion. Without project expected annual damages range from $150 - $250 million. If flooded, an added dimension to the disaster would be a possible wastewater treatment plant containment failure which would impact water quality in the Delta and could interrupt water deliveries to the communities in the southern valley and to Southern California.

Beneficial impacts due to the action would include risk management to the current critical infrastructure within the study area. Adverse impacts due to the action include the possibility for additional critical infrastructure being located within the RD 17 basin, potentially in the deepest areas of flooding, thereby increasing to the critical infrastructure already in place.

See Base Flood Plain Step 4 above for the expected losses of natural and beneficial flood plain values discussion.

5. If the action is likely to induce development in the critical action flood plain, determine if a practicable non-flood plain alternative for the development exists.

There may be opportunities to locate some future critical facilities outside the critical action flood plain. However, facilities such as schools and fire stations must be placed within close proximity to any future development. Therefore, if development occurs as shown in Figure 3-20, there will be no practicable non-critical action flood plain alternative for these critical facilities.

6. As part of the planning process under the Principles and Guidelines, determine viable methods to minimize any adverse impact of the action including any likely induced development for which there is no practicable alternative and methods to restore and preserve the natural and beneficial flood plain values. This should include reevaluation of the "no action" alternative.

See Base Flood Plain Step 6.

7. If the final determination is made that no practicable alternative exists to locating the action in the flood plain, advise the general public in the affected area of the findings.

See Base Flood Plain Step 7.

8. Recommend the plan most responsive to the planning objectives established by the study and consistent with the requirements of the Executive Order.

As a result of the analysis required for compliance with E.O. 11988, USACE has made a determination that alternatives 7a, 8a, and 9a have little or no unmitigated adverse effects to flood plain areas and are therefore compliant with EO 11988.

3.6.2 Result of Executive Order 11988 Analysis

As a result of the analysis required for compliance with E.O. 11988 as discussed above, the RD 17 alternatives were removed from further consideration in this draft feasibility study. This action results in a policy compliant array of the following alternatives for identification of the NED and TSP plans: Alternative 7a, Alternative 8a, and Alternative 9a.

It is understood that RD 17, with funding assistance from the State, is currently pursuing a phased strategy of levee improvements to initially increase the resistance of RD 17's levee system to under seepage and through seepage. Upon completion of that work, RD 17 and the non-Federal sponsors intend to pursue USACE participation in additional studies/improvements necessary to achieve the non-Federal objective of 200-year (0.5 percent ACE) flood risk management in order to meet SB 5 requirements. Consideration of future Federal participation would be subject to demonstration of a Federal interest in such incremental improvements.

3.7 Environmental Considerations and Mitigation

All appropriate environmental resources were analyzed during development of the proposed alternatives to fully comply with NEPA and CEQA. Most impacts to resources as a result of implementation of a proposed project can be mitigated, but there are challenges related to impacts to riparian habitats within the study area.

3.7.1 Regional Context

Riparian habitats are substantially reduced from their historical extents throughout the Central Valley. Only about 2-5 percent of the historic riparian habitat still exists (RHJV 2004). This is true along the San Joaquin River as well. Establishment of the FRM system, with levees set immediately adjacent to the main rivers and tributaries contributed to this decline and continues to result in conflicts between ecosystem health and sustainability and maintenance of the FRM system. Upstream of the proposed project area, considerable Federal and state investment has been made to improve the riparian corridor as part of the San Joaquin River Restoration Program and the Federal and state refuge systems.

In general, riparian communities are among the richest community types, in terms of structural and biotic diversity, of any plant community found in California. Riparian vegetation provides important ecological functions, including: wildlife habitat; migratory corridors for wildlife; pollution filtration and waterway shading, thereby improving water quality; provides connectivity between waterways and nearby uplands; and biomass (nutrients, insects, large woody debris, etc.) to adjacent waterways. Riparian forests and woodlands – even remnant patches – are important to resident and migratory fish, birds, and other wildlife.

3.7.2 Study Area

The riparian corridor in the study area is severely constrained by the proximity of the flood management levees to the rivers, tributaries and sloughs. Throughout most of the corridor vegetation is highly altered and fragmented. Nevertheless, this vegetation is all that remains as habitat to resident and migratory fish and wildlife in the proposed

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April 13, 2015

VIA E-MAIL -
VIA FEDEX

Ms. Tanis Toland
U.S. Army Corps of Engineers
1325 J Street
Room 1513
Sacramento, CA 95814-2922

Re: Lower San Joaquin River Basin Integrated Interim Feasibility Report and Draft Environmental Impact Statement/Environmental Impact Report

Dear Ms. Toland:

Thank you for the opportunity to submit comments on behalf of our client, Reclamation District 17 ("RD 17"), regarding the Lower San Joaquin River Basin Lower San Joaquin River, CA Draft Integrated Interim Feasibility Report/Environmental Impact Statement/Environmental Impact Report ("Draft FR/EIS/EIR").

15-1 On numerous occasions during the plan formulation process, we advised the San Joaquin Area Flood Control Agency (SJAFCA) and the U.S. Army Corps of Engineers (USACE) of our concerns regarding the USACE's proposal to exclude the RD 17 levees from the USACE's Lower San Joaquin River Basin flood control project. (See Exhibit 1 *SJAFCA 2/5/15 Letter*). Our concerns fell on deaf ears.

15-2 We reviewed the Draft FR/EIS/EIR with a specific focus on the plan formulation process and the alternatives that the USACE and SJAFCA evaluated for flood management in the Lower San Joaquin River study area. As a major participant in the Local Sponsor Group, and a sponsor of significant funding for the Draft FR/EIS/EIR, RD 17 objects to the USACE's premature and unlawful decision to remove from consideration flood risk reduction alternatives for RD 17 in the Draft FR/EIS/EIR. Our review suggests that the draft documents provide clear and convincing evidence that the USACE already made up its mind to reject the RD 17 levees from consideration *before* the USACE and SJAFCA completed the Feasibility Report and the environmental review process under the National Environmental Policy Act (42 U.S.C. 4321 *et seq.*) ("NEPA") and the California Environmental Quality Act (Pub. Res. Code 21000 *et seq.*) ("CEQA"), and long before the public had an opportunity to offer its comments on the alternatives under consideration.

As stated on Draft FR/EIS/EIR page ES-12, the USACE selected Alternative 7a – North and Central Stockton alternatives excluding RD 17 as the Tentatively Selected Plan (the "TSP"). The USACE's arbitrary and unlawful process for selecting Alternative 7a as the TSP for the Lower San Joaquin River Basin flood management plan as set forth in the FR/EIS/EIR is pre-decisional and deprived the public of a meaningful opportunity to review and comment on the practicable alternatives for flood management in the Lower San Joaquin River Basin. Yes, the USACE advised the public that it could comment on the draft documents, but unfortunately, it is
15-3 too late; the USACE already recommended Alternative 7a as the TSP. To remedy the defects reflected in the FR/EIS/EIR, RD 17 requests that the USACE (1) analyze and consider the RD 17 alternatives (Alternatives 7b, 8b, and 9b) in this Feasibility Report at a level of detail commensurate with the level of analysis the USACE afforded Alternative 7a (the "Tentatively Selected Plan"), and add an analysis of the RD 17 preferred plan which consists of improvements to the RD 17 levees without the secondary levee along the San Joaquin River ("RD 17 Preferred Plan").

<u>Overview of Reclamation District 17 and the Federal Interest</u>

Reclamation District 17 was founded in 1863, and operates and maintains approximately 19 miles of levees within the Lower San Joaquin River Basin. The Lower San Joaquin River study area is located along the lower (northern) portion of the San Joaquin River system in the Central Valley of California. RD 17 is located just south of the confluence of French Camp Slough and the San Joaquin River, in the lower third of the Lower San Joaquin River Delta. RD 17 is defined by the levees extending along the right bank of the San Joaquin River, the left bank of French Camp Slough and the right bank of Walthal Slough. A dry-land levee is situated at the upstream end of the reclamation district (see Draft FR/EIS/EIR Economic Appendix, Appendix C – November 2014, page 13). Of the 19 miles of levees, 16.18 miles are Federal project levees
15-4 for which the USACE completed construction in 1963 – over 50 years ago.

RD 17 is charged with the management and operation of existing Federal project levees which protect the Cities of Lathrop and Manteca and a portion of Stockton. As explained on page 1-20 of the Draft FR/EIS/EIR, improving the lower reaches of the San Joaquin River and Tributaries was authorized by the Flood Control Act of 1944 (Public Law 532, December 22, 1944, 78th Congress, 2nd Session), as modified by Public Law 327, 84th Congress, 1st Session (see also, Appendix C, Economic Appendix – November, 2014 at p. lxxiv). The San Joaquin River and Tributaries Project provided for the Federal Government to improve the levee system on the San Joaquin River from the Delta upstream to the Merced River, by raising and strengthening existing levees and revetment of river banks where required. The local interest plan of improvement was coordinated with the Federal Government's plan to provide for the maintenance and operation of the levees. After the Federal Government completed its project, the levees were turned over to the State and the reclamation districts for maintenance and operation in accordance with the Secretary of the Army's requirements (see FR/EIS/EIR at p. 1-20). Thus, since 1963, the USACE's Federal project system has protected the Lower San

Joaquin River Basin, and specifically, the RD 17 geographic area, and the Federal Government has retained a Federal interest in the Federal Project system.

RD 17 has maintained and operated the Federal Project levees in accordance with the Secretary of the Army's Operations and Maintenance Manual and Supplemental Manual for over 50 years. Further, since 1990, RD 17 has undertaken repairs to the levees to continue to maintain 100-year flood protection. At no time has the Federal Government informed RD 17 that Congress has de-authorized the Federal Project levees protecting RD 17, or otherwise revoked its decision to flood protect the area. Thus, the Federal interest in RD 17 has already been made, and the USACE cannot change its mind 50 years later and refuse to acknowledge the Federal investment made in the area.

<u>The FR/EIS/EIR Fails to Adequately Analyze and Consider the RD 17 Alternatives, including the RD 17 Preferred Plan, and the FR/EIS/EIR Must be Revised.</u>

The USACE and its non-Federal sponsors, SJAFCA, and the State of California Central Valley Flood Protection Board, propose to improve flood risk management in the Lower San Joaquin River Basin. The USACE and its non-Federal sponsors prepared the FR/EIS/EIR and purported to follow the Federal planning process for the development of water resource projects in order to identify the TSP to recommend to Congress for authorization (see e.g., FR/EIS/ EIR, Chapter 8).

15-5

The overall purpose of the proposed flood management project is to reduce flood risk to urban and urbanizing parts of the *Study Area* as explained in Chapter 3 of the FR/ EIS/EIR. The USACE, however, selected an agency preferred alternative that only protects *part of* the Study Area and completely excludes RD 17. During the Feasibility Report process, the USACE identified its preferred alternative (Alternative 7a) which was limited by the USACE's decision to remove from consideration the RD 17 Alternatives (Alternatives 7b, 8b, and 9b). Alternative 7a is the National Economic Development (NED) Plan, and it serves to set the level of Federal participation in a project resulting from the Feasibility Report. In the interest of time, the USACE proceeded with Alternative 7a as the TSP and removed from further consideration any improvements to RD 17 on the basis that the USACE must avoid the unwise use of floodplains and flood-prone areas (see Draft FR/EIS/EIR, p. 3-64). Consequently, the USACE decided it had no choice but to select Alternative 7a as the TSP. Even though the Federal investment has been made for a flood risk project to protect RD 17 since 1958, the USACE decided now in 2015 that it was "unwise" for the local communities to have ever made land use decisions based on that Federal investment (see Draft FR/EIS/EIR, p. 3-64).

The USACE's decision to remove from consideration any improvements to the RD 17 levees conflicts with Congress' prior authorizations to flood protect the area. While Alternative 7a provides flood risk management for North and Central Stockton, Alternative 7a does not meet the non-Federal sponsor's objectives of flood risk management and SB 5 compliance for RD 17 and the Cities of Lathrop and Manteca and a portion of Stockton as required as a matter of State law because Alternative 7a excludes any flood control improvements and flood management for

RD 17 and the Cities of Lathrop and Manteca and a portion of Stockton. The Draft FR/EIS/EIR evaluates the RD 17 Alternatives at a very general level of analysis, and, despite requests from RD 17 and SJAFCA, the document did not include *any* information and analysis for the RD 17 Preferred Plan. Because the RD 17 Preferred Plan meets the project objectives, is practicable and flood protects 43,600 residents who would otherwise be exposed to exacerbated flooding conditions associated with the TSP, the USACE must revise the FR/EIS/EIR to include a robust analysis of the RD 17 Preferred Plan and incorporate this information throughout the entire document.

<u>The USACE's Decision to Reject from Further Consideration RD 17 Levee Alternatives is Pre-Decisional and Deprived the Public of a Meaningful Opportunity to Review and Comment on the USACE's Proposal and Alternatives</u>.

The USACE's decision to omit the RD 17 Preferred Plan and its refusal to consider a more detailed level of analysis of the RD 17 Alternatives (Alternatives 7b, 8b, and 9b) in the FR/EIS/EIR was pre-decisional and violated Federal limitations on actions during the NEPA process. Specifically, until the USACE issues a record of decision (ROD) as provided in Title 40 of the Code of Federal Regulations section 1506.2, Section 1506.1 prohibits the USACE from undertaking any action which would limit the choice of reasonable alternatives (see USACE ER 200-2-2). Predetermination occurs when an agency irreversibly and irretrievably commits itself to a plan of action that is dependent upon the NEPA [and CEQA] analysis before that analysis has been completed (see e.g., *Cedar-Riverside Environmental Defense Fund v. Hills*, 422 F. Supp. 294 (D. Minn 1976), judgment vacated, 560 F. 2d 377 (8th Cir. 1977) (bias found when agency prematurely focused on project alternatives).

15-6 Here, the USACE prematurely selected and committed to the TSP, and then rejected from further review any alternatives involving the RD 17 levees *before* releasing the Draft FR/EIS/EIR for public review and comment because the USACE claims now that flood protection in RD 17 conflicts with Executive Order 11988 on Floodplain Management (see page 3-64). Such a decision conflicts with the decades of flood protection the USACE previously provided to the area. Since RD 17 was informed by SJAFCA before the release of the Draft FR/EIS/EIR that the USACE intended to remove from consideration the RD 17 levee alternatives, we requested that SJAFCA identify for CEQA purposes the local sponsors' alternatives to reduce flood risk in RD17 (see attached Exhibit A). Although SJAFCA requested that the USACE consider this information in the Draft FR/EIS/EIR document, the USACE refused to include the RD 17 Preferred Plan and instead released the document and pre-determined the outcome of the planning process.

<u>The USACE's Process is Arbitrary and Capricious in Violation of the APA</u>.

The USACE's decision-making process concerning the selection of Alternative 7a as the TSP violates the Administrative Procedures Act (Pub.L. 79-404, 60 Stat. 237). The USACE decided to remove from consideration the RD 17 Alternatives from detailed review in the FR/
15-7 EIS/EIR on the basis that the alternatives do not comply with Executive Order 11988 before it

even considered the public's comments on the Feasibility Report and before completing the NEPA process. Further, the basis for selecting Alternative 7a as the TSP is without support, and the USACE's decision was arbitrary and capricious and an abuse of discretion under the Administrative Procedure Act, 5 U.S.C. § 706 (1980) ("APA"). In applying the "arbitrary and capricious" standard of the Administrative Procedure Act, a court will consider the administrative record already in existence. (*See e.g., Camp v. Pitts,* 411 U.S. 138, 93 S.Ct. 1241, 36 L.Ed.2d 106 (1973); *Avoyelles Sportsmen's League, Inc. v. Marsh,* 715 F.2d 897 (5th Cir.1983)). As the administrative record shows, the Draft FR/EIS/EIR documents the USACE's decision to proceed with Alternative 7a as the TSP and the preferred project before completing the NEPA process and before informing the public that it already made up its mind that it would exclude improvements to the RD 17 levees. The USACE's actions are arbitrary and capricious because the USACE attempted to justify its decision to remove the RD 17 Alternatives from further consideration by (1) claiming that Executive Order (EO) 11988 prohibits the USACE from making a Federal investment in RD 17 when it does not, and (2) failing to disclose to the public that the Draft FR/EIS/EIR not only removes from consideration RD 17 Alternatives, but the USACE has actually selected an alternative, Alternative 7a as the TSP which exacerbates flood hazards to the 43,600 residents. (*See e.g., Greater Yellowstone Coalition v. Lewis*, 628 F.3d 1143, 1148 (9th Cir. 2010) (as amended) (relying on *The Lands Council v. McNair*, 537 F.3d 981, 987 (9th Cir. 2008) (en banc), *overruled on other grounds by Winter v. Natural Res. Def. Council,* 555 U.S. 7 (2008)); *Envtl. Def. Ctr.*, 344 F.3d at 858 n.36; *Brower*, 257 F.3d at 1065). For these reasons, the USACE's actions violate the APA.

The USACE Failed to Comply with its own SMART Planning Procedures.

The USACE claims to follow the guidance contained in the Planning Bulletin No. PB 2013-03-Reissue (14 March 2014) regarding the SMART Planning Milestones, but it did not. Specifically, the USACE did not consider and disclose the effects of a reasonable range of alternatives that met its planning objectives for the LSJRFS.

First, under the SMART planning procedures, the TSP Milestone marks "vertical team concurrence on a single plan the PDT will carry forward in the feasibility study…." (PB 2013-
15-8 03-Reissue, page 1, Item 4). The Planning Bulleting indicates that the identification of the TSP, however, does not preclude the PDT from also presenting another plan (PB 2013-03-Reissue, page 1, Item 4). The USACE did not do that. Instead, the USACE indicated that the single plan it will carry forward is Alternative 7a which excludes any improvements to the RD 17 levees. While the USACE noted that Alternative 7a did not address the objectives of the local sponsors, it removed from further consideration all of the RD 17 Alternatives, and it did not identify the RD 17 Preferred Plan which would have addressed the objectives of the local sponsors. In so doing, it also prejudiced the local sponsors' ability to seek future Federal investment in a locally-supported plan for flood control improvements to the RD 17 levees.

As an example of the USACE's efforts to pre-determine the outcome of the TSP process before it even started the process (and before the public could even comment on the process), the
15-9 February 2015 LSFJS Engineering Summary (page 6) expressly states that:

"Just *prior* to a TSP decision on which alternative to formulate for, USACE is recommending that only North and Central Stockton geographically defined areas be considered for TSP inclusion."

The Engineering Summary further claims that,

"The geographical area of RD-17 conflicts with USACE policy EO 11988 which is being coordinated with the sponsor" (see page 6).[1]

With that, the USACE removed the RD 17 alternatives from further consideration in the Draft FR/EIS/EIR and identified the TSP, before the document was even circulated to Headquarters for review. Then, because the TSP excluded the alternatives with the RD 17 levees, the USACE rejected the RD 17 alternatives outright from further detailed consideration in the FR/EIS/EIR claiming that the RD 17 Alternatives could not be considered because they were not identified in the TSP.

To add to the confusion, the USACE stated in the FR/EIS/EIR that,

> "A full array of alternatives will be considered and evaluated. However, feasibility level design work will focus on the agency recommended plan *and a Locally Preferred Plan (LPP)* if appropriate" (see FR/EIS/EIR at p. 1-2).

15-10

The SMART Guidance, however, does not limit the USACE to considering only the agency recommended plan or a Locally Preferred Plan. In fact, the guidance indicates that the USACE may consider other plans as explained in the Planning Bulletin - PB 2013-03-Reissue. It was misleading for the USACE to advise the public that it was limited in the alternatives that could be considered, particularly in this case where another plan, the RD 17 Preferred Plan, meets the planning objectives of the LSJRFS, protects existing residents, and is policy compliant.

15-11

Secondly, the agency's preferred plan, the TSP, does not meet the USACE's own planning objectives for the area. For example, the first 2 planning objectives in Section 2.3.3 Planning Objectives (page 2-11) state that, "the planning objectives are as follows:

- Reduce risk to property and infrastructure due to flooding in Stockton; Lathrop and Manteca (NED Account);
- Reduce flood risk to public health, safety and life in Stockton, Lathrop, and Manteca (OSE Account)."

[1] EO 11988 is an Executive Order, and not a USACE policy. Moreover, the lands within the "geographical area of RD-17" were reclaimed pursuant to the Swamp Land Act of 1850 (U.S. Rev. Stats., sec 2479) and this is conclusively determined to be the lands which passed to the state under the act (*Foss v. Johnstone*, 158 Cal. 119 [110 P. 294]; *Bates v. Halstead*, 130 Cal. 62 [62 P. 305]. The USACE has provided flood protection to this agricultural and urbanizing area since 1963.

The USACE's TSP fails to meet its own planning objectives for half of the Study Area. Alternative 7a (which is the USACE's recommended TSP) only reduces flood risk to a portion of Stockton. RD 17 and SJAFCA informed the USACE on numerous occasions that the RD 17 Preferred Plan is either Alternative 7b or 9b (with the elimination of the secondary levee at the confluence of Old River and the San Joaquin River), with the expectation that the RD 17 Preferred Plan would be evaluated in the Draft FR/EIS/EIR. The USACE, apparently decided without any basis that evaluation and feasibility level design work was "not appropriate" and screened out all of the RD 17 Alternatives (including the RD 17 Preferred Plan) from any further design work and detailed analysis, as indicated on pages 1-6 and 3-64 of the Draft FR/EIS/EIR. Thus, the FR/EIS/EIR does not meet the USACE and local sponsors' planning objectives for the Study Area.

The FR/EIS/EIR does not comply with the USACE's December 2012 procedures entitled, "Environmental Evaluation and Compliance within the SMART Planning Framework" (the "SMART Environmental Framework"). According to page 4 of the SMART Environmental Framework:

> "Prior to this phase [preparation of the feasibility level analysis phase], and before making the *tentatively selected plan [emphasis added]* the agency recommended plan, there will be an Agency Decision Milestone that takes into consideration concurrent public/agency comments and technical, policy and legal review comments on the draft integrated feasibility report/NEPA document. At this stage, the agency has considered all impacts from the proposed plan and compared alternatives before making the final recommendation and documentation."

15-12 In this case, the USACE already screened out from further review the RD 17 Alternatives and never considered the RD 17 Preferred Plan as an alternative which should have been evaluated at a level of detail commensurate with the TSP. While the USACE informed the public in the Draft FR/EIS/EIR of its reasons for screening out alternatives (i.e., that "RD 17 has planned development which makes it difficult to comply with the EO 11988 guidance," see page 3-22), the basis upon which the USACE relies is unfounded because the water resource policies that the USACE claimed prohibited the USACE from considering the RD 17 Alternatives do not actually prohibit approval of the RD 17 Alternatives because there is planned development. Moreover, the TSP *exacerbates* flooding impacts to the existing 43,600 residents in RD 17, particularly in the lower sections of RD 17, because of the USACE's decision to improve flood protection north of RD 17 and exclude RD 17 from 100-year flood protection. Creating *greater* flood-related hazards to an *existing* population would hardly seem to comply with USACE water resources policies designed to minimize flood risk. The USACE, however chose not to disclose this information to the public.

For these reasons, the USACE must revise the FR/EIS/EIR to include the RD 17
15-13 Preferred Plan and provide a more robust analysis of the RD 17 Alternatives. The RD 17 Preferred Plan and the RD 17 Alternatives should be considered in the FR/EIS/EIR and Chapters

3, 4 and 5 must be revised accordingly. For example, the USACE should add a discussion of the RD 17 Preferred Plan on pages 3-6 and Section 3.2.5, pages 3-17 to 3-19 and Section 3.3, pages 3-22 to 3-27, and Section 3.4, pages 3-27 to 3-67 in the project description, as well as Section 4.4 Alternatives on pages 4-13 through 4-30.[2] The RD 17 Preferred Plan must be identified in the FR/EIS/EIR as the only practicable solution for reducing flood risk for RD 17 and the Study Area pursuant to the Feasibility Report's own planning objectives. If the USACE decides not to identify the RD 17 Alternatives in the Final FR/EIS/EIR, then the USACE must revise the FR/EIS/EIR to inform the public that the USACE's decision to eliminate the RD 17 alternatives will preclude the USACE's ability to provide improved FRM to the 43,000 residents and critical infrastructure located within RD 17 (see FR/EIS/EIR, page 3-56).

Removal of RD 17 Alternatives From Consideration Violates EO 11988.

Issued by the President of the United States on May 24, 1977 and recently amended by President Obama on January 30, 2015, Executive Order (EO) 11988, entitled "Flood Plain Management," seeks to minimize actions by Federal agencies which may adversely affect floodplains. EO 11988 and its implementing regulations direct Federal agencies to evaluate the effects of the proposed action on floodplains and to avoid taking action which would affect such areas unless there are no practicable alternatives (see 44 Fed. Reg. 28524, *et seq*, now published at 33 C.F.R. part 240). The USACE's decisions related to Executive Order 11988 are subject to judicial review under the Administrative Procedures Act (see e.g., *City of Carmel by the Sea v. U.S. Department of Transportation*, 123 F.3d 1142 (9th Cir. 1997).

The USACE follows an 8-step process to evaluate the effects of a Federal project on the floodplain as described in the Draft FR/EIS/EIR on pages 2-52 – 3-58). If an action is located within the floodplain, the USACE must advise the public about the action and then identify the
15-14 beneficial and adverse impacts of the action and any expected losses of natural beneficial floodplain values. If the action is likely to induce development in the base floodplain, then the USACE must determine "whether a practicable non-floodplain alternative for the development is available" and if one is not, then the USACE must advise the public regarding its findings.

Over the years, RD 17 has continued to fulfill its obligations to maintain and operate the Federal project levees and to repair the levees, as necessary, to restore the functioning of the system and protect people within the RD 17 boundaries from 100-year events. In 2010, however, the USACE changed the methodology for assessing levee integrity and applicable levee seepage standards that govern whether an area is within the 100-year floodplain (even though this determination has been historically made by the Federal Emergency Management Agency) (FEMA). After changing the levee standards, the USACE concluded that the RD 17 Federal project levees which (the USACE built) do not meet the USACE's new standards, and so now the USACE found that the Federal project levees no longer provide 100-year flood

[2] The local non-Federal sponsors did not propose a secondary levee because it added significantly to the cost of construction and maintenance since improving the existing levee is necessary to avoid significant hydraulic consequences downstream. Further, abandoning the existing levee would conflict with federal law, the expectations of private ownership and the contracts regarding the operations and management of the USACE project levees.

protection. But then, rather than plan to fix the levees through this Feasibility Report, the USACE concluded that it is unable to fix the levees because EO 11988 prohibits the USACE from fixing the Federal levees to comply with the USACE's new standards.

But it doesn't stop there. In the Draft FR/EIS/EIR, the USACE first said that the impact analysis of alternative plans was based only upon an evaluation of effects,

> "against existing conditions since these conditions either reasonably represent future conditions in the project area or because using existing conditions will facilitate full evaluation and disclosure of the greatest potential impacts of the proposed project" (see page 5-1).

15-15

Page 1-21, however, which lists all of the projects and programs affecting the San Joaquin River levee system does not describe any improvements to the Federal Project levees in RD 17 since FEMA accreditation of discrete levee segments in RD 17 in 1990. For the past 25 years, however, the USACE has undertaken repairs and improvements to the RD 17 levees and RD 17 has obtained approval for and completed construction of two phases of the San Joaquin River Levee Stability Program. None of these projects are reflected in the existing or future baseline conditions, even though, the USACE changed its mind in the Draft FR/EIS/EIR and indicated that the analysis of alternative plans for flood control was based upon existing and future hydrologic and hydraulic conditions (see page 5-30). What happened to the 25 years of flood protection improvements to RD 17 levees that resulted in prior determinations that this area is not located within the 100 year floodplain?

15-16

The USACE decided to ignore the 25 years of existing flood control-related projects, and instead treat these *past and present* efforts to repair the existing levees and take the area out of the 100 year floodplain as *future* projects (see Draft FR/EIS/EIR pages 5-364 and 365). Then, because the USACE found that the RD 17 area is in the 100-year floodplain (which it is not), the USACE concluded it could not approve *any* RD 17 Alternatives to protect the existing 43,600 residents because that would be "unwise." The USACE claims that it is "unwise" to fix the RD 17 levees to reduce flood risk to Lathrop, Manteca, and portions of Stockton (which are urban and urbanizing parts of the Study Area) on the basis that the Cities' existing land use planning efforts (which relied on Congress' direction to reclaim the land under the Swamp Lands Act and the Federal investment made since 1958 to take the area out of the 100-year floodplain) could further induce development in an area that was already meant to be urbanized. That, according to the USACE, is not allowed. The very agency who built or accepted the levees in the first place has now decided it is prohibited from fixing the levees to continue protecting 43,600 existing residents, because Lathrop and Manteca planned for future development in this area in reliance on the 100-year flood protection the USACE provided under the Lower San Joaquin River and Tributaries Project. Rather than disclose the full range of impacts to the existing communities in accordance with EO 11988, the USACE, instead, chose to violate Congress' directives under the Swamp Lands Act and ignore the years of flood protection efforts implemented as part of the Lower San Joaquin River and Tributaries Project.

15-17

RD 17 is not in the 100-year floodplain as determined by FEMA. As even the Draft FR/EIS/EIR indicates (see pages 5-364 and 5-365), RD 17 has implemented Phases 1 and 2 of the seepage and repair project to fix seepage issues based on the USACE's new criteria, that the USACE is now using as the reason it has decided RD 17 is in the 100-year floodplain. Since the area is not in the 100-year floodplain as determined by FEMA, EO 11988 limitations on approving projects which may be growth-inducing should not even apply. If, however, the USACE continues to assume the RD 17 area is in the 100-year floodplain, then the USACE must revise its EO 11988 analysis to reflect the true existing and baseline conditions, and disclose the human and environmental impacts that the USACE's decisions concerning the TSP will have on the local communities. We request that the following information be incorporated into the FR/EIS/EIR discussion on pages 3-51 through 3-58 and pages 5-358 through 5-360, and all other applicable sections for consistency purposes.

15-18

- The RD 17 area is not in a natural floodplain. The area is already developed with a mix of urban residential, commercial, industrial, public/quasi-public uses, and commercial agriculture in reliance upon the existing Federal Project levee system.

15-19

- The RD 17 Preferred Plan (i.e., improvement of the existing RD 17 levees with the dry land / tie-back) is the only practicable alternative to reduce the flood risk to the 43,600 residents and billions of dollars of public and private investment including in particular Interstate 5, Highway 120, the San Joaquin County Hospital, the San Joaquin County Jail and correctional facilities, numerous schools, health care facilities, the City of Lathrop Civic Center, fire stations and police facilities. Interstate 5 and State Route 120 are critical evacuation routes.

15-20

- As flood risks increase due to climate change or re-evaluation of potential flood flows, the area dependent upon protection from the RD 17 levees will extend to the north and east encompassing the Sharpe Army Depot, critical rail facilities and major portions of the City of Stockton including the Port and the Regional Wastewater Treatment Facilities. Failure to increase the flood protection for RD 17 also increases the risk of flood damage to the environment and human health and safety. Loss of life, injury and disease for approximately 43,600 humans, as well as, pets and terrestrial species, stranding and predation of fish species including those with special status, loss of riparian habitat along the levee breaks and those areas eroded by the high velocity flows in the vicinity of the levee break, contamination of flood waters both within the flooded areas and the areas to which the flood waters will be discharged and severe vandalism and looting are all significant impacts that flow from the failure to provide adequate flood protection for RD 17.

15-21

- Even if the RD 17 levees are considered to be within the 100-year floodplain (which is not the case when the USACE considers the effectiveness of RD 17's levee seepage repair projects), the RD 17 Preferred Plan would take the area out of the 100-year floodplain. Assuming that the RD 17 area would be located outside of the 100-year floodplain, whether or not additional development would actually occur in RD 17 would not impact the USACE's obligation to disclose indirect impacts or any measures to minimize the alternative's effects. Contrary to the statements made in the FR/ EIS/EIR (see e.g., pages 3-54 through 3-67), Executive Order 11988 and the implementing guidance do not prohibit the USACE from considering a project which is designed to protect existing residents and land uses because future development or growth may occur. In fact, EO 11988 requires only that the USACE disclose to the public that the proposed alternative is the "only practicable[3] alternative," and design a plan in which steps are taken to minimize potential damage to the floodplain (see e.g., *City of Carmel by the Sea v. U.S. Department of Transportation*, 123 F.3d 1142 (9th Cir. 1997)).

<u>Removing RD 17 Alternatives From Further Consideration Violates EO 12898 on Environmental Justice</u>.

The Draft FR/EIS/EIR includes a cursory discussion regarding the effects on low income and minority populations due to the proposed TSP. The Draft FR/EIS/EIR relies upon the Lower San Joaquin River Feasibility Report Other Social Effects Regional Economic Development report dated February 15, 2015 ("Social Effects Report") to support its conclusions. The assessment, however, is based only upon social characteristics of Stockton and California (see Table 2, page 7). Other than population density information, no data was provided regarding the minority and low-income status of residents within Lathrop, Manteca and Southern San Joaquin County. The exhibits included in the Social Effects Report further confirm that Alternative 7A results in no improvement whatsoever in flood protection for RD 17.

15-22

The Draft FR/EIS/EIR states on page 7-5:

> "No disproportionately high or adverse human health or environmental effects on minority or low-income communities have been identified."

Page 5-260 of the Draft FR/EIS/EIR, however, reaches a contrary conclusion finding that Alternatives 7a, 8a, and 9a would not address flood risk in RD 17 which would impact an area that is "more than 50 percent populated by minorities."

The USACE failed to inform the public that 43,600 residents in RD 17, many of whom would meet the definitions of minority and low-income for purposes of an environmental justice analysis, would be adversely impacted by the USACE's decision to proceed without flood risk management for RD 17. We understand that the City of Lathrop has submitted additional demographic data regarding the residents in the Lathrop portion of RD 17 to further illustrate the disproportionate impact on local residents. Accordingly, the analysis must be revised.

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[3] See e.g., the Federal Highway Administration's definition of "practicable" which is defined as "capable of being done within reasonable natural, social, or economic constraints" (23 CFR 650.105(k). This definition resembles the Section 404(b)(1) Guidelines which define practicability in terms of costs, logistics and other technological considerations.

<u>The Draft EIS is Inadequate and Fails to Comply with NEPA and CEQA.</u>

We understand that the local communities of Lathrop, Manteca and Stockton are submitting comments on the Draft FR/EIS/EIR. RD 17 hereby, incorporates by reference into RD 17's comments any comments submitted by the local municipalities. We further understand
15-23 that SJAFCA recently submitted comments on the Draft FR/EIS/EIR. RD 17 incorporates by reference SJAFCA's April 9, 2015 critical comments on the Draft FR/EIS/EIR.

We also offer the following specific comments concerning the Draft FR/EIS/EIR's failure to adequately evaluate the RD 17 Alternatives and to properly disclose the impacts of Alternative 7a, the TSP plan, as the USACE's preferred alternative.

- The Notice of Intent to Prepare a Joint EIS/EIR for the Lower San Joaquin River Feasibility Study indicated that the USACE will "evaluate alternatives, including a locally preferred plan or other plan, for providing flood damage reduction and ecosystem restoration along the lower (northern) portion of the San Joaquin River System" (see 75 Fed. Reg. 2517). The USACE did not do that. Instead, the Draft
15-24 FR/EIS/EIR evaluates in detail Alternative 7a, but it fails to evaluate in any detail the RD 17 Preferred Plan, and rejects from consideration any of the RD 17 Alternatives so there is little, if any, detailed analysis to accompany the EIS/EIR impact discussions. Consequently, the RD 17 Preferred Plan must be added to Chapter 3 in the FR and included in the evaluation of impacts and mitigation measures for RD 17 Preferred Plan throughout Chapters 5 through Chapter 9.

- *Chapter 5.4, the discussion of Alternative 7a on page 5-32* states that Alternative 7a would have a significant beneficial impact by reducing the exposure of people to a significant risk of loss, injury or death due to flooding, and that this alternative would
15-25 not substantially alter drainage patterns. The Draft FR/EIS/EIR, however fails to disclose that the residents in RD 17 who would not receive a reduction in flood risk, would actually be exposed to a *greater* risk of flood hazards. This information should be added to Chapter 5.4.

- *Chapter 5.8 (see e.g., Pages 5-98, 5-104, 5-109 and 5-114)* states that "levee repairs and improvements would provide future flood-risk protection, as well as carbon sequestration (due to restoration of riparian habitat associated with levee repair and
15-26 improvement)." While this may be true for the North and Central Stockton areas, it is not the case for RD 17. This discussion should be revised, accordingly, and a discussion of the RD 17 Preferred Plan should be added to Chapter 5.8.

- *Chapter 5.9 (see e.g., Pages 5-139, 5-159, and 5-160)* describes impacts to SRA habitat associated with Alternative 7b. Please explain what portion of this impact (if
15-27 any) would be due to the secondary levee (which RD 17 does not support as a practicable alternative).

- *Chapter 5.14, Pages 5-270 to the third full paragraph on page 5-271* states that the changes in land use from the implementation of Alternative 7a do not conflict with land use plans, policies, or regulations. This statement does not accurately describe the impacts that would occur to the existing land uses, residents, businesses, and
15-28 major public facilities and infrastructure within RD 17 that would be exposed to existing and increased risk of flood hazards due to the selection of Alternative 7a as the TSP, as well as the conflicts with the adopted general plans and policies for the cities of Lathrop, Manteca and Stockton.

- *Chapter 5.23, Cumulative Impacts* - The Draft FR/EIS/EIR fails to accurately disclose the cumulative impacts associated with Alternative 7a and the significant and unavoidable environmental impacts on RD 17 associated with implementation of Alternative 7a. For example, assuming RD 17 is in the 100-year floodplain (which it is not), no analysis is provided of the hydrology and flood impacts resulting from Alternative 7a's failure to flood protect RD 17 as further discussed above (see FR/EIS/EIR, pp. 5-386-387). Additionally, the Draft FR/EIS/EIR is silent on the fact that
15-29 Alternative 7a would exacerbate flooding impacts to RD 17 and to the 43,600 residents that will experience greater flood risk. Further, the Draft FR/EIS/EIR analysis of cumulative impacts incorrectly treats all three phases of the RD 17 seepage repair project as if they are future projects. In fact, Phases I and II exist today and are part of existing conditions. Thus, the USACE must revise the FR/EIS/EIR to accurately reflect the baseline conditions for purposes of measuring the project's impacts and cumulative impacts under NEPA (40 C.F.R. § 1508.7) and in accordance with CEQA Guidelines Section 15130. Consequently, the USACE must revise the cumulative impact analysis and incorporate this analysis into the Final FR/EIS/EIR in order to accurately reflect cumulative impacts to RD 17.

The Draft EIR suffers from the same defects as the EIS, and thus, should be revised as set
15-30 forth above to comply with CEQA for the same reasons.

<u>The USACE failed to comply with the Section 404(b)(1) Guidelines</u>.

The Section 404(b)(1) Evaluation included as an appendix to the Draft FR/EIS/EIR states that the overall purpose of the project is to reduce flood risk to urban and urbanizing parts of the study area, including the City of Stockton (Appendix A-4, page 5). The Section 404(b)(1) Evaluation fails to acknowledge that the original purpose was to reduce flood risk for the entire
15-31 Lower San Joaquin River Basin. Moreover, the only alternatives evaluated in the Section 404(b)(1) Evaluation, other than the No Project Alternative, are Alternative 7a, 8a and 9a. The USACE removed from consideration the RD 17 Alternatives on the basis that they were impracticable because the USACE claimed that these alternatives do not comply with USACE water resources policies. The USACE's decision is puzzling at best. Now the USACE has found that an alternative which would require that the USACE maintain the Federal project levee system it was responsible for in the first place, is no longer practicable because that same Federal agency decided the same Federal project levee system is not consistent with that Federal

agency's water resources policies. As a result, the Section 404(b)(1) Evaluation did not, but should have, evaluated the RD 17 Preferred Plan because this alternative is a practicable alternative in terms of costs, logistics, and technological considerations. Consequently, the Section 404(b)(1) Evaluation must, at a minimum, be revised to include the RD 17 Plan as a practicable alternative.

We appreciate your consideration of our comments on the FR/EIS/EIR and look forward to the USACE's issuance of a revised FR/EIS/EIR with the requested analysis of the RD 17 Preferred Plan and the clarifications regarding the extent of the Alternative 7a impacts to RD 17.

Sincerely,

BUCHALTER NEMER
A Professional Corporation

By
Alicia Guerra

AG:al

Attachments

cc: Tyler Stalker
Dante Nomellini
Jim Giottonini, SJAFCA
Roger Churchwell, SJAFCA
Glenn Gebhardt, City of Lathrop

SJAFCA
San Joaquin Area FLOOD CONTROL Agency

RECEIVED
FEB 25 2015
BY

February 23, 2015

Alicia Kirchner, Chief
Planning Division, Sacramento District
U.S. Army Corps of Engineers
1325 J Street, Room 902
Sacramento, CA 95814

LOWER SAN JOAQUIN RIVER FEASIBILITY STUDY

Thank you for all of the work that the U.S. Army Corps of Engineers continues to do in support of flood risk reduction for the Lower San Joaquin River. I am writing today to ask that you consider including the language in the attached document in the draft Lower San Joaquin River Feasibility Study and joint EIS/EIR scheduled to be released at the end of this month. One of our supporting local agencies, Reclamation District 17, has asked that this language be included as a CEQA-only section in order to keep, as broad as possible, the discretion of the agencies that will need to certify the document under CEQA.

SJAFCA remains excited to see the draft document scheduled to be released at the end of the month and will be traveling to Washington DC next week to support our request for additional funding from the USACE Workplan to allow completion of the study.

Please do not hesitate to contact me if you have any questions.

Giotto

JAMES B. GIOTTONINI
EXECUTIVE DIRECTOR

JBG:dc

Attachment

cc: Scott Shapiro, Downey Brand
Dante Nomellini, Nomellini, Grilli & McDaniel
Eric Koch, Department of Water Resources

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SAN JOAQUIN AREA FLOOD CONTROL AGENCY
SAN JOAQUIN RIVER BASIN LOWER SAN JOAQUIN RIVER

STATEMENT OF DIFFERENT TREATMENT OF ALTERNATIVES IN ENVIRONMENTAL IMPACT REPORT (CEQA)

The U.S. Army Corps of Engineers (USACE) and its non-Federal sponsors, the San Joaquin Area Flood Control Project (SJAFCA), and the State of California Central Valley Flood Protection Board, propose to improve flood risk management in the Lower San Joaquin River Basin. The USACE and SJAFCA have prepared an Integrated Interim Feasibility Study and Joint Environmental Impact Statement (EIS)/Environmental Impact Report (EIR) for the proposed Lower San Joaquin River Flood Risk Management Project. The joint EIS/EIR is intended to meet the requirements of both the National Environmental Policy Act ("NEPA") and the California Environmental Quality Act ("CEQA"). SJAFCA prepared this Statement to the Environmental Impact Report in order to include solely for CEQA purposes the alternatives for reducing flood risk in RD17 which due to the USACE analysis of EO11988 were screened from the final set of alternatives in the joint EIS/EIR. Reducing flood risk in RD 17 is critical to the integrity of the flood control system for the entire feasibility study area and needs to be accomplished with or without federal assistance. The RD 17 improvements may be constructed separately from any USACE funded project. The two alternatives retained for CEQA purposes are 7b and 9b with the variation of excluding what has been referred to the secondary levee at the confluence of Old River and the San Joaquin River.

The USACE and SJAFCA conducted the Interim Feasibility Study and followed the Federal planning process for the development of water resource projects in order to identify a Tentatively Selected Plan (TSP) recommendation to Congress for authorization. The overall purpose of the proposed flood management project is to reduce flood risk to urban and urbanizing parts of the study area as further explained in Chapter 3 of the Integrated Feasibility Study/Joint EIS/EIR. The final array of alternatives involve improving levees or constructing new levees located in the base 1% (1/100) annual chance exceedance (ACE) floodplain.

During the Feasibility Study process, a preferred alternative was identified, limited by the USACE determination to screen out alternatives, in order to proceed with the TSP. The TSP reflects the identification of Alternative 7a as the NED Plan which serves to set the level of federal participation in a project resulting from the Feasibility Study. SJAFCA, however, has confirmed with its local participating agencies that while Alternative 7a provides flood risk management for North and Central Stockton, Alternative 7a does not meet the non-Federal sponsor's objectives of flood risk management and SB 5 compliance for RD 17 and the Cities of Lathrop and Manteca because Alternative 7a excludes flood control improvements and flood management for RD 17.

By contrast, the local non-Federal sponsors support Alternative 7b and 9b as consistent with their project objectives to include flood protection for RD-17. As described in further detail in Chapter 3 of the Feasibility Study, Alternatives 7b and 9b included flood risk management improvements in RD 17. Alternatives 7b and 9b would implement the same levee improvements

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and closure structures as Alternatives 7a and 9a but would include levee improvements on the existing RD17 levees and approximately 2.2 miles of new levees (dry land or tie-back levees) extending to the east. The Alternatives 7b and 9b new levees would include a cut off wall to address potential seepage issues. Although Alternatives 7b and 9b include RD-17 improvements consistent with the local sponsor's objectives, the local sponsors are not proposing a secondary levee at the confluence of Old River and the San Joaquin River ("Secondary Levee").

Accordingly, as the CEQA Lead Agency, SJAFCA is evaluating Alternatives 7a and 7b and 9a and 9b in the Joint EIS/EIR in order to provide a full evaluation of the environmental impacts associated with the TSP, should the Federal government fund the NED Plan, as well as Alternatives 7b or 9b without the secondary levee which would be consistent with the local sponsor's proposed project and project objectives. Additionally, this statement to the EIR evaluates the environmental impacts of elimination of the secondary levee on Alternatives 7b and 9b.

The secondary levee at the confluence of Old River and the San Joaquin would be redundant to the existing levee. The existing levee is necessary to avoid significant changes in the hydraulics of the flow split between Old River and the San Joaquin. More flow in the San Joaquin will increase flood risk to downstream areas including the City of Stockton, the Stockton Port and the Regional Wastewater Treatment facilities. The redundant levee would greatly increase the cost of construction and maintenance in that the existing levee will in any event need to be improved to provide the needed level of protection for downstream areas. Construction of the secondary levee would also add significantly to the impacts to the ongoing agricultural operations.

Improvement of the existing RD 17 levees with the dry land / tie-back is the only practicable alternative to reduce the flood risk to the 43,000 residents and billions of dollars of public and private investment including in particular Interstate 5, Highway 120, the San Joaquin County Hospital, the San Joaquin County Jail and correctional facilities, numerous schools, health care facilities, the City of Lathrop Civic Center, fire stations and police facilities. As flood risks increase due to climate change or re-evaluation of potential flood flows the area dependent upon protection from the RD 17 levees will extend to the north and east encompassing the Sharpe Army Depot, critical rail facilities and major portions of the City of Stockton including the Port and the Regional Wastewater Treatment Facilities.

Failure to increase the flood protection for RD 17 also increases the risk of flood damage to the environment and human health and safety. Loss of life, injury and disease for humans, pets and terrestrial species, stranding and predation of fish species including those with special status, loss of riparian habitat along the levee breaks and those areas eroded by the high velocity flows in the vicinity of the levee break, contamination of flood waters both within the flooded areas and the areas to which the flood waters will be discharged and severe vandalism and looting are all significant impacts that flow from failure to provide adequate flood protection for RD 17.

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SAN JOAQUIN COUNTY
FLOOD CONTROL & WATER CONSERVATION DISTRICT
P.O. BOX 1810
1810 EAST HAZELTON AVENUE
STOCKTON, CALIFORNIA 95201
TELEPHONE (209) 468-3000
FAX NO. (209) 468-2999

MICHAEL SELLING
ACTING FLOOD CONTROL ENGINEER

April 9, 2015

Ms. Tanis Toland
U.S. Army Corps of Engineers
1325 J Street
Sacramento, California 95814-2922

SUBJECT: DRAFT FEASIBILITY REPORT AND JOINT ENVIRONMENTAL IMPACT STATEMENT/ENVIRONMENTAL IMPACT REPORT FOR THE LOWER SAN JOAQUIN RIVER FEASIBILITY STUDY

Dear Ms. Toland:

16-1 The San Joaquin County Flood Control and Water Conservation District (District) concurs with the comments provided by the San Joaquin Area Flood Control Agency (SJAFCA) on the subject documents and hereby incorporates those comments by this reference. Additionally, the District would like to take this opportunity to highlight two of the comments it considers to be of particular importance:

16-2

1. <u>Confirm that the Tentatively Selected Plan (TSP) Provides a 200-Year Level of Flood Protection</u>
   SJAFCA's comment on this issue explains that the document is not clear whether the TSP will meet the sponsors' objective of complying with Senate Bill 5 requirements (i.e. providing 200-year level protection). As indicated in SJAFCA's comment, "Because this is such an important issue to the sponsors and their constituents, the Draft needs to be more clear and up-front about whether, or to what extent, Alternative 7a (the TSP) will meet 200-year protection requirements." The District concurs that this is a critical issue for which the Draft Report should provide clarification.

16-3

2. <u>Removing the Reclamation District 17 (RD 17) Area from the Study</u>
   The District concurs with SJAFCA's position that inclusion of the RD 17 area in the study is policy compliant with Executive Order 11988, and that the alternative including improvements for this area is appropriate. If alternative 7b, or another alternative that includes the improvements for the RD 17 area, is not ultimately identified as the Selected Plan for the Study, the District supports a subsequent feasibility study being initiated for the RD 17 area as soon as practicable.

If you have any questions or would like additional information, please feel free to contact me at (209) 468-3101, or by e-mail @ fbuchman@sjgov.org.

Sincerely,

FRITZ BUCHMAN, P.E.
Deputy Director / Development

FB:nt
LSJRFS - COMMENT LETTER TO USACE 4-8-15.DOCX

c: Jim Giottonini, Executive Director, San Joaquin Area Flood Control Agency
Michael Selling, Acting Flood Control Engineer
John Maguire, Engineering Services Manager

Toland, Tanis J SPK

From: Nomellini, Grilli & McDaniel PLCs [ngmplcs@pacbell.net]
Sent: Tuesday, April 14, 2015 6:39 AM
To: 'Roger Churchwell'; 'Scott Shapiro, Scott'; '<Peterson David'; 'Fritz Buchman'; '<John Maguire'; 'Jim Giottonini'; 'Kurt Wilson'; Kirchner, Alicia E SPK; Savinon, Joana M SPK; Cowan, Mark E SPK; Samuelson, Stacy D SPK; Toland, Tanis J SPK
Cc: 'Donna Cooksey'
Subject: [EXTERNAL] RE: Followup letter pertaining to comments to the Draft Report

Jim and Roger: Hopefully, you can encourage the USACE to include the RD 17 levee improvements (without the secondary levee at the confluence of the San Joaquin and Old River) in the environmental documents and
17-1 the NED for the current feasibility study. The trailing study concept is a path to nowhere. It is critical to keep our community working together to protect all our residents and investments and not leave huge holes in our flood protection. If the USACE doesn't correct its' wrongdoing I suspect we are faced with potentially an extended confrontation. The stigma of USACE misapplication will harm our community for a long time and
17-2 particularly those who are most disadvantaged. DJN Sr

Nomellini, Grilli & McDaniel
Professional Law Corporations
235 East Weber Avenue
Stockton, CA 95202
Mailing address:
P.O. Box 1461
Stockton, CA 95201-1461
Telephone: (209) 465-5883
Facsimile: (209) 465-3956
Email: ngmplcs@pacbell.net

From: Roger Churchwell [mailto:Roger.Churchwell@stocktongov.com]
Sent: Monday, April 13, 2015 2:54 PM
To: Scott Shapiro, Scott; Dante John Nomellini; <Peterson David; Fritz Buchman; <John Maguire; Jim Giottonini; Kurt Wilson; Alicia E SPK Kirchner; Joana M SPK Savinon; Mark.E.Cowan@usace.army.mil; Stacy SPK Samuelson; Tanis J SPK Toland
Cc: Donna Cooksey
Subject: Followup letter pertaining to comments to the Draft Report

Alicia

Attached is a followup letter in support of our letter sent on comments to the Draft Report. We are sending this prior to the close of the comment period so this letter can be included with our prior letter. We look forward in talking with you and staff.

Regards Roger

Roger Churchwell, P.E., CFM
Deputy Executive Director
San Joaquin Area Flood Control Agency
22 E. Weber Ave., Room 301
Stockton, CA 95202
Phone (209) 937-8866
cell (209) 373-8484

Fonseca Farms, Inc.
22695 S. Airport Way
Manteca, CA 95337
(209) 456-2496 – fax (209) 239-1257

April 10, 2015

U.S. Army Corps of Engineers - Sacramento District
Attn: Ms. Tanis Toland - tanis.j.toland@usace.army.mil
1325 J Street, Sacramento, CA 95814-2922

San Joaquin Area Flood Control Agency
Attn: Mr. Juan Neira - juan.neira@stocktongov.com
22 East Weber Ave. Suite 301, Stockton, CA 95202-2317

RE: San Joaquin River Basin Lower San Joaquin River, CA
DRAFT; Integrated Interim Feasibility Report, Environmental Impact Statement, and Environmental Impact Report, dated February 2015.

Public Review and Comment:

My name is Michael Fonseca, President and co-owner of Fonseca Farms Inc. situated in the southern area of San Joaquin County at 22695 S. Airport Way, Manteca, CA 95337. We have been farming within the proximity of the levee improvements and extension since 1948. We have not only witnessed, but lived through and survived the constant evolution of Mother Nature, climate, natural resources, including droughts, and major floods that had directly impacted our lives in 1950, 1986, and 1997.

My concerns with the San Joaquin River Basin Draft Reports will focus specifically but not limited to the RD-17 levee improvements and levee extension in Manteca.

18-1 The segmentation and the taking of our land will be a catastrophic event that our farming operation may not be able to withstand. Our family farm is the sole provider of three separate households and families as well as provides employment opportunities for other local residents. Our primary crop in this area is Almonds, and our land is the necessity of producing a marketable crop in order to generate sufficient cash flow to sustain our quality of life. The current alignment of the levee imposes the threat of reducing our annual income, or forcing us to obtain higher operating costs to relocate and replenish the lost acreage. The consideration that needs to be addressed is, our land needed for levee improvements is not a recreational space, or a decorative landscape, but for us it's what puts a roof over head and what feeds our families.

18-2 The footprint of the levee improvements and extension to construct seepage stability berms and or cut-off walls with the current alignment imposes significant adverse impacts and threatens the quality and integrity of the adjacent properties and infrastructure. Not only will the impacts affect me personally as I have three separate parcels that the levee is currently adjacent to or is proposed to extend through, but as well as all the nearby residents. My personal residence is adjacent to the water-side of the levee leaving concern for encroachment issues with my current infrastructure such as the foundation of my home and domestic well less than 100 feet away, with septic tank and leach field even closer. I have other infrastructure such as, buildings, producing farm land and a large irrigation well that will be impacted. Situated on the property is a second home being approximately 25 feet away from the water-side of the levee. I also own property on the landside of the extension in which my brother occupies as his primary residence with his domestic well and septic tank approximately 50 feet away from the levee.

18-3 The construction of seepage stability berms up to 300 feet wide are not a practical solution for this area. With the current alignment of the levee, in one case there is only 75 feet between the foundations of two homes. There is not adequate open land available for the construction of such berms, improvements to the existing levee which include raising the height, or for any O&M easements to be established without the removal of one of the homes.

18-4 Impacts of the water-side of the levee due to construction of a cut off wall will increase the elevation of an already shallow water table that is currently about 7 feet in this area. Any increase in elevation can have a significant impact to septic tanks and leach fields causing inadequate draining and possible sewage backup into the homes. Impacts on the land-side of the levee will restrict the movement of and deplete ground water resulting in lowering the elevation of the water table decreasing pumping efficiency and the water quality. The close proximity of the construction of the cut off walls to the existing wells will contaminate the wells and may be deemed not adequate for consumptive use.

18-5 In the report, Table 3-11, Planning Criteria Analysis for Final Alternatives states, "Table 3-11 demonstrates the effectiveness of alternatives in meeting the planning criteria." One of the four criteria indicated in the table is Efficiency, which states, "Efficiency is the extent to which an alternative plan is the most cost-effective means…" What this statement fails to mention is the most cost effective means is to the benefit of only the agencies leading this project and has not took into consideration the impacts of the individuals with adjacent properties to the improvements or extension of the levee. The report indicates cost effective means for the project is to continue the extension of the levee in a straight line that currently aligns with an impractical modified alignment that was constructed during the 1997 flood. This alignment may be viewed as cost effective to the lead agencies, however not to the public it impacts. It creates property segmentation that adversely impacts the current use of the property remaining. A true cost effective solution may mean that the project cost may increase due to mitigation measures to property owners or the cost of construction to realign the levee in a path that follows property lines to reduce property segmentation and to avoid encroaching on private infrastructure, such as homes, buildings, wells, septic tanks, and producing farm land.

18-6 A second criterion of Table 3-11 indicates acceptability which states, "Acceptability is the workability and viability of the alternative plan with respect to acceptance by State and local entities and the public and compatibility with existing laws, regulations, and public policies". The alignment clearly violates local public policies as The San Joaquin General Plan of 2007, policies concerning its governance of land use within the county states in part, "To promote and protect agriculture as the primary industry of the county, minimize conflict between various land uses resulting from urban expansion, and deny all uses that intrude into or are located adjacent to an agricultural area if they are detrimental to continued agricultural usage of the surrounding area".

18-7 Two of the four criteria indicated in the report have not been satisfied. The only cost effective measures implemented are for the lead agencies and not for the local residents that suffer from the adverse impacts. Local public policies are being violated and there is lack of public acceptance resulting from no public outreach and involvement with the RD-17 portions of the levee improvements and extension.

18-8 There are other practical alternatives to the alignment with levee improvements and extension that needs to be considered. I have attempted to work with local authorities such as the City of Manteca and RD-17; however a practical compromise is unachievable due to the constraints, restrictions, and regulations that are imposed on them by higher authorities such as U.S. Army Corps of Engineers and San Joaquin Area Flood Control Agency. The common response to my concerns is the cost associated with implementing other alternatives or the possibility of inducing future development. The priority needs to shift to public outreach and involvement to the local residents, rather than the cost effective measures strictly to the benefit of the lead agencies. An alternative to truly accomplish the goals of flood protection with the least amount of adverse impact to the local residents and land owners needs to be considered.

Due to the lack of public outreach and involvement, I request to be put on all contact and mailing lists that are available, with the following as my main contact information and forwarded to all additional addresses included:

Michael Fonseca
(209) 456-2496
fonsecafarmsinc@aol.com
P.O. Box 4208, Manteca, CA 95337

Michael Fonseca (Personal Residence)
[redacted]

Fonseca Farms, Inc. (Attention: Michael Fonseca)
22695 S. Airport Way, Manteca, CA 95337

Richard Fonseca
21164 S. Airport Way, Manteca, CA 95337

Thank you for your time to review and consider my concerns and to ensure that a viable and mutually agreed upon alignment for levee improvements and extension will be achieved with a true and accurate measure that contains the least amount of adverse impact to the local residents.

Michael Fonseca
(209) 456-2496
fonsecafarmsinc@aol.com
P.O. Box 4208, Manteca, CA 95337

JOHN MINNEY, CIVIL ENGINEER
17137 Road 37
Madera CA 93636
559-275-5937 559-645-0870

March 31, 2015 Job F14030

Ms. Tanis Toland
U.S. Army Corps of Engineers, Sacramento District
1325 J Street
Sacramento, California 95814-2922

SUBJECT: LOWER SAN JOAQUIN RIVER PROJECT INTERIM REPORT

Dear Ms. Toland:

As requested by an almond grower in the RD 17 area of the proposed levee project, I have reviewed relevant portions of the overall project as it relates to an existing almond orchard operation. Specifically, the almond operation is on the extreme southern end of the levee project.

I am a civil engineer, geotechnical engineer and licensed well drilling contractor in the State of California. I have previously been licensed in Oregon, Missouri and Michigan. I have been in the construction business with emphasis on soil and water for 45 years. I did a substantial amount of work on the USACE Lock & Dam 26 project just outside St. Louis in the 1970's.

The increased flood protection afforded by levee projects such as this is clearly a public benefit. However, the levees and associated construction also can adversely affect immediately adjacent property. The primary adverse effect that I am referring in the specific case of the almond orchards on the extreme south end of the levee project are changes in the groundwater table. Groundwater in that area is historically known to be shallow and the almond trees are susceptible to damage if the root zone is flooded.

19-1 Typically, the levees will impound water but can have seepage going under the levee driven by the impounded head of water. That seepage can adversely affect the structural stability of the levees so there typically is a seepage control mechanism incorporated under the levee. The seepage control mechanisms are typically some combination of cutoff walls and/or drainage trenches.

The issue of cut-off walls is discussed in numerous places in the document. Attached are portions of the document where the same comment is inserted on multiple locations. My comment is as follows:

THIS DISCUSSION SECTION APPEARS INCOMPLETE BECAUSE IT DOES
NOT CONSIDER THE USE OF DRAINS AS OPPOSED TO, OR IN CONJUNCTION
WITH, CUT-OFF WALLS TO ENHANCE STRUCTURAL PERFORMANCE DURING
HIGH WATER IMPOUNDMENT PERIODS. THE CUT-OFF WALL WOULD TYPICALLY
BE MORE COST-EFFECTIVE FROM THE STANDPOINT OF BUILDING AND
MAINTAINING THE LEVEES BUT THE CROPS, PARTICULARLY ALMOND TREES,
CAN BE FLOODED OUT IN THE ROOT ZONE IN ANY TIME OF HIGH
19-2 GROUNDWATER BECAUSE THE NATURAL SUBSURFACE DRAINAGE IS
LITERALLY CUT-OFF BY A CUT-OFF WALL. THIS ROOT ZONE FLOODING CAN
HAPPEN EVEN IF NO ABOVE-GROUND FLOODING OCCURS. BY INSTALLING
ONLY A CUTOFF WALL BARRIER UNDER THE PROPOSED LEVEES, THE
CURRENT DESIGN EFFECTIVELY GUARANTEES THAT THERE WILL BE MORE

PROBLEMS WITH SHALLOW ROOT ZONE FLOODING AND TREE ROOT DROWNING EVEN IF NO FLOODING WOULD HAVE OCCURRED. THIS IS BECAUSE THE MINIMAL NATURAL DRAINAGE WHICH PERIODICALLY RESULTS IN TREE KILLS WILL BE SUBSTANTIALLY WORSENED BY THE CUTOFF BARRIER. A DRAIN SYSTEM IN COMBINATION WITH THE CUTOFF WALL IS ABSOLUTELY ESSENTIAL TO LONG TERM TREE GROWTH BEHIND THE LEVEES.

MY RECOMMENDATION IS TO INSTALL A SUBDRAIN SYSTEM ON THE INSIDE TOE OF THE LEVEE WHICH WOULD MAINTAIN THE GROUNDWATER LEVEL AT LEAST 5 FEET BELOW THE BOTTOM OF THE ROOT ZONE OF THE ALMOND TREES. THE SYSTEM WOULD INCLUDE A GRAVEL INTERCEPTOR TRENCH TO WITHIN NOMINALLY 3 FEET OF THE ORIGINAL GROUND SURFACE WITH THE GRAVEL ENCAPSULATED IN FILTER FABRIC AND A PERFORATED COLLECTOR PIPE IN THE BASE OF THE GRAVEL. A DEDICATED PUMP WOULD LIFT THE COLLECTED WATER FOR DISPOSAL ELSEWHERE. THE PUMP WOULD ACTIVATE AUTOMATICALLY BY FLOAT CONTROL.

THE WATER SO COLLECTED WOULD REQUIRE DISCHARGE OFF-SITE. BECAUSE THE SHALLOW GROUNDWATER SO COLLECTED IS MORE THAN LIKELY TO CONTAIN CONSTITUENT LEVELS HIGHER THAN THE LARGE FLOOD WATERS, A WAIVER TO ALLOW AUTOMATIC DISCHARGE OF THE COLLECTED GROUNDWATER WOULD NEED TO BE OBTAINED.

If you have any questions or comments in this regard, please do not hesitate to contact me.

Respectfully submitted,

John Minney

John Minney, CE 32537

REGISTERED PROFESSIONAL ENGINEER
JOHN M. MINNEY
No. 32537
EXP 6/30/15
CIVIL
STATE OF CALIFORNIA

JOHN MINNEY, CIVIL ENGINEER
17137 Road 37
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559-275-5937 559-645-0870

March 31, 2015

Job F14030

Ms. Tanis Toland
U.S. Army Corps of Engineers, Sacramento District
1325 J Street
Sacramento, California 95814-2922

SUBJECT: LOWER SAN JOAQUIN RIVER PROJECT INTERIM REPORT

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Typically, the levees will impound water but can have seepage going under the levee driven by the impounded head of water. That seepage can adversely affect the structural stability of the levees so there typically is a seepage control mechanism incorporated under the levee. The seepage control mechanisms are typically some combination of cutoff walls and/or drainage trenches.

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PROBLEMS WITH SHALLOW ROOT ZONE FLOODING AND TREE ROOT DROWNING EVEN IF NO FLOODING WOULD HAVE OCCURRED. THIS IS BECAUSE THE MINIMAL NATURAL DRAINAGE WHICH PERIODICALLY RESULTS IN TREE KILLS WILL BE SUBSTANTIALLY WORSENED BY THE CUTOFF BARRIER. A DRAIN SYSTEM IN COMBINATION WITH THE CUTOFF WALL IS ABSOLUTELY ESSENTIAL TO LONG TERM TREE GROWTH BEHIND THE LEVEES.

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If you have any questions or comments in this regard, please do not hesitate to contact me.

Respectfully submitted,

John Minney, CE 32537

REGISTERED PROFESSIONAL ENGINEER
JOHN M. MINNEY
No. 32537
EXP 6/30/15
CIVIL
STATE OF CALIFORNIA

JOHN MINNEY COMMENTS INSERTED IN BOLD RED TYPE

(Excerpt Cover Page)

LOWER SAN JOAQUIN RIVER PROJECT INTERIM REPORT

SAN JOAQUIN COUNTY, CALIFORNIA

DRAFT

INTEGRATED INTERIM FEASIBILITY REPORT/ENVIRONMENTAL IMPACT STATEMENT/ENVIRONMENTNAL IMPACT REPORT

FEBRUARY 2015

Type of Statement: Draft integrated Feasibility Report/Environmental Impact Statement/Environmental Impact Report (FR/EIS/EIR)

Lead NEPA Agency: U.S. Army Corps of Engineers, Sacramento District Lead

CEQA Agency: San Joaquin Area Flood Control Agency

Cooperating/Responsible Agency: State of California Central Valley Flood Protection Board

Abstract: The U.S. Army Corps of Engineers and its non-Federal sponsors, the San Joaquin Area Flood Control Agency (SJAFCA) and the State of California Central Valley Flood Protection Board, propose to improve flood risk management to North and Central Stockton by repairing and enhancing the levees that surround the city, and by constructing and operating closure structures on Fourteenmile Slough and Smith Canal. The draft FR/EIS/EIR describes the environmental resources in the project area; evaluates the direct, indirect, and cumulative environmental effects of the seven alternative plans; and identifies avoidance, minimization, and mitigation measures.
Most potential adverse effects would be either short term, or would be avoided or reduced using best management practices. However, there are some significant and unavoidable impacts associated with this project.

Public Review and Comment: The public review period will begin on February 27, 2015 and the official closing date for receipt of comments on the draft FR/EIS/EIR will be April 13, 2015. A public workshop will be held Wednesday, April 8, 2015, at the Stockton Civic Auditorium, South Hall, 525 North Center Street, Stockton, CA from 6:00- 8:00 p.m. All comments received will be considered and incorporated into the final EIS/EIR, as appropriate. Written comments or questions concerning this document should be directed to the following: U.S. Army Corps of Engineers, Sacramento District; Attn: Ms. Tanis Toland; 1325 J Street; Sacramento, California 95814-2922, or by e-mail: Tanis.J.Toland@usace.army.mil or San Joaquin Area Flood Control Agency; Attn: Mr. Juan Neira, 22 East Weber Avenue, Suite 301, Stockton, California 95202-2317, or by email at Juan.Neira@stocktongov.com.

(Excerpt 2-6)

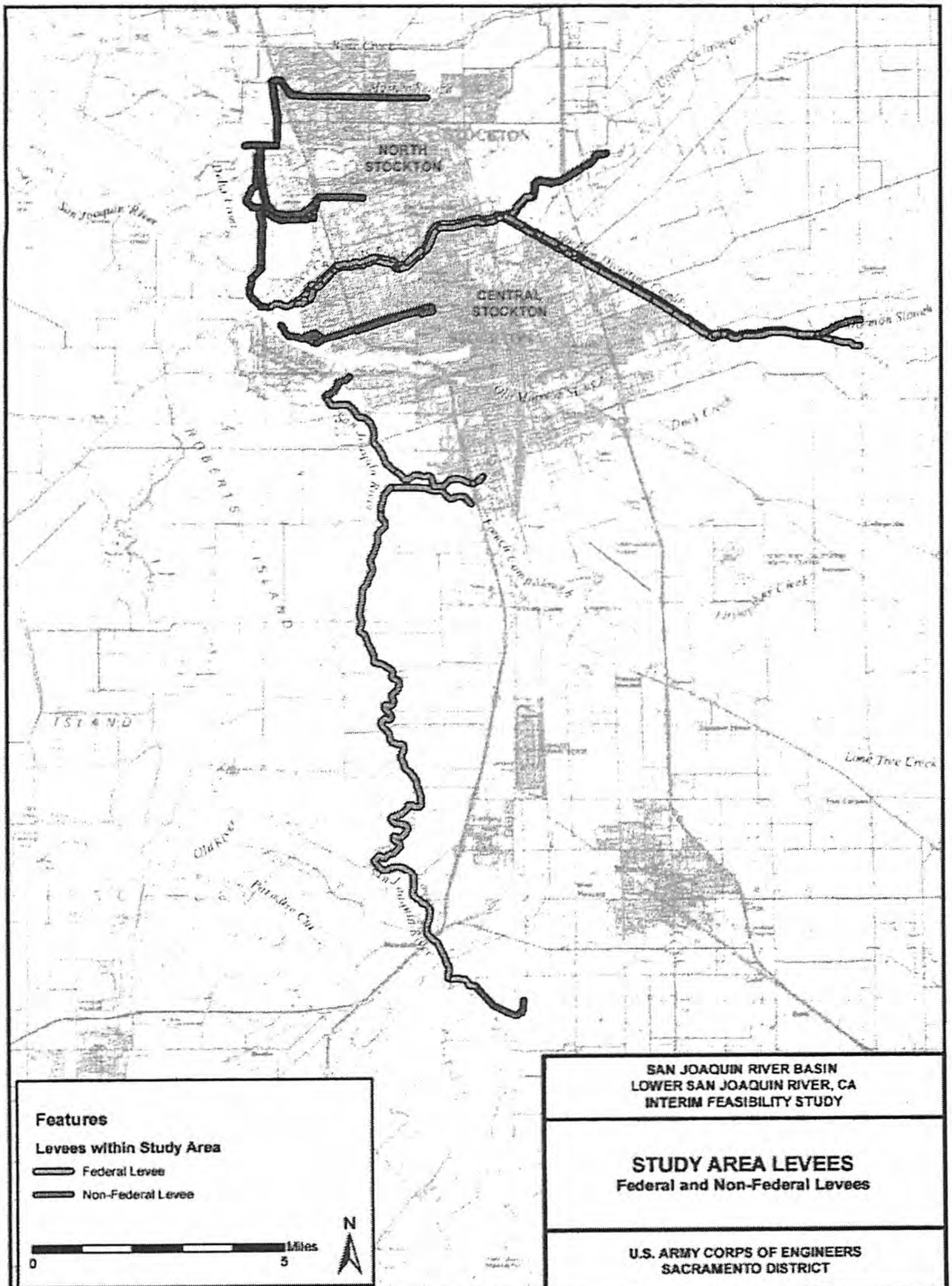

Figure 2-5: Study Area Levees.

(Excerpt 2-7)

The primary risk of flooding in the study area is geotechnical failure of the existing project levees, and not hydrologic or hydraulic factors that result in levee overtopping. Recent geotechnical analysis and evaluation of historical performance during past flood events have resulted in a greater understanding of under - seepage and a revision of levee design criteria. Geomorphologic and geotechnical studies identified subsurface features, such as former river channels, and meanders. The potential for seepage problems to occur along the existing levees in the project area is created by discontinuous layers of coarse - grained pervious soils (i.e., sands and gravels). These are found at varying depths of up to 100 feet. During high - water events, water from the river can enter the pervious soil layers and then move laterally through these layers under/through the levee. Excessive seepage can erode soil within the levee and lead to a rapid collapse and subsequent breach. Historically, foundation conditions were evaluated assuming homogeneous materials, but the floods of 1986 and 1997 and the resulting levee failures throughout the Central Valley resulted in a revision of the criteria for the evaluation of under-seepage. The risk of levee failure is not due to design deficiency or to lack of O&M of the existing levees, but to a better understanding of the mechanics of under - seepage in the Central Valley. The project levees within the study area do not meet current USACE levee design criteria and are at risk of breach failure at stages considerably less than levee crest elevations. This is evidenced by historical levee boils and heavy seepage at river stages less than design flows.

Geotechnical related issues such as under - seepage breach failures result in large volume flood flows at high velocities that are sudden and unpredictable. These failures have minimal warning time and minimal time for effective implementation of evacuation and emergency plans. Study area flood events generally occur during the winter months when colder air and water temperatures significantly increase the risk of death by exposure. The risk probability of unexpected levee failure coupled with the consequence of basin - wide flooding presents a continued threat to public safety, property, and critical infrastructure in the Lower San Joaquin River basin.

The existing levee system within the study area protects over 71,000 acres of mixed-use land with a current population estimated at 264,000 residents and an estimated $21 billion in damageable property. In addition to the residents and property, the levee system protects approximately 23 structures considered to be critical infrastructure (hospitals, police and fire stations, etc.) as well as the Interstate 5 and State Highway 99 corridors.

(Excerpt 3-3)

Ring Levees for Critical Infrastructure

This measure would protect specific critical infrastructure or facilities through placement of ring levees around those features. Ring levees would be built to a height adequate to reduce expected frequency of inundation of the structure without modifying the flood plain (See Section 3.1). Typical design for a ring levee would include a top width of 12 to 20 feet and side slopes with a ratio of 3 to 1. A cut-off wall for seepage issues may be required depending on the geotechnical analysis of the levee foundation.

Relocations/Buy-outs

This measure would remove at-risk structures and individuals from the flood plain. Structures would either be moved to sites outside the flood plain or demolished and the material recycled or disposed of as appropriate.

Comprehensive Flood Warning Emergency Evacuation Planning

Flood Warning System

This measure would allow for timely warning and evacuation of at-risk areas. This could be accomplished through media announcements and reverse 911 automated calling to residents and businesses with the area.

Implement Emergency Evacuation Plan

This measure is an activity that the non-Federal sponsors would implement to meet the study objective of reducing flood risk to public health, safety and life. Evacuation routes from areas within the flood plain would be identified and provided to the public on maps showing the routes, emergency response staging areas, and contact information for emergency service agencies.

Flood Plain Management

Restrictive Zoning/Land Use Planning

This measure would implement land use planning and zoning restrictions for areas within the flood plain to minimize risk in those areas. Implementation of this measure would include the creation and use of a Flood Plain Management Plan (FMP) for the project area in accordance with Section 402 of the Water Resources Development Act of 1986, as amended (33 USC 701b-12), when a project is implemented.

(Excerpt 3-4)

Manage Land Use within Flood-prone Areas

This measure is an activity that the non-Federal sponsors would implement to meet the study objective of reducing flood risk to public health, safety and life. California SB 5 described in Section 2.2.2 is such a measure.

3.1.2 Structural Measures

Levee Raises

Raising levee height to increase the level of performance of existing levees is the focus of this measure. Increase in levee height may require additional levee footprint area to meet design requirements for minimum levee slope and top width. Levee raises would be accomplished by adding material to achieve the desired height. Height increases would be accomplished while maintaining design top width and side slopes, and may require additional landside easement(s) to allow for the increase in levee footprint and necessary access easements.

Cut-off Walls

This measure would be implemented to address through- and under-seepage issues that affect levee performance and safety. Installation of the cut-off wall is accomplished by degrading the levee to one-half height and creating the wall with a soilbentonite mix. Once the mix has cured, the levee is restored to design height and side slopes to meet current design standards. The depth of the cut-off walls will typically be from 20 to 80 feet, depending on subsurface conditions, which will be determined more precisely during the PED phase through additional borings and corresponding depth required to stop through and under-seepage.

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Deep Soil Mixing (Seismic)

This measure would be implemented to provide seismic stability to the Delta Front levees where required. The measure addresses seismic risk in the Delta Front levees due to the makeup of the foundational geomorphology. The Delta area soils are typically unconsolidated alluvial deposits. The deep soil mixing (seismic) measure would involve installation of a grid of drilled soil-cement mixed columns aligned longitudinally with, and transverse to the levee extending beyond the levee prism. This measure acts to minimize lateral deformation of the levee during seismic events.

Setback Levees

Where in-place improvements of levees may not be effective, and adequate footprint area exists, this measure could be implemented to improve the hydraulic capacity and overall effectiveness of the levee system. This measure would allow for ecosystem restoration measures on the water side of the new levee. Setback levees would be built to a height equal to that of the existing levee system. Typical design for a

(Excerpt 3-5)

setback levee would include a top width of 12 to 20 feet and side slopes with a ratio of 3 to 1. A cut-off wall for seepage issues may be required depending on the geotechnical analysis of the levee foundation. Depending on goals, the existing levee could be degraded, breached or left in place after construction of the setback levee.

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Seepage / Stability Berms

Installation of seepage/stability berms in areas where land-side footprint allows, would increase levee stability and reduce through- and under-seepage resulting in increased levee performance and safety. The berm would be installed on the land-side of the existing levee to control seepage exit gradients that occur during an event. Typically the berms are five to 10 feet thick and vary in width extending landward from the landside levee toe from 100 to 200 feet. Actual dimensions will vary depending on the seepage gradients present.

Erosion Protection

This measure would consist of protection of the water-side banks of levees to prevent or reduce erosion due to high flows, tides, or wave action. Bank protection could be placed on existing banks or at the toe and side of the levee to above the design water surface elevation, as necessary. Protection would consist of rock sized to withstand expected flows, tidal action, and wave run-up for the reach of levee installed on which the protection is placed.

Bridge Modifications for Flow Conveyance

This measure would be used to address areas where existing bridges may be identified as a localized limit to hydraulic capacity. Bridge modifications could include raising or widening bridges to increase hydraulic capacity through the bridge crossing. Low water road crossings will be replaced by bridges as a component of this measure.

Upstream Bypass of High Flow

This measure would consist of increased diversion of high flows from the mainstem of the San Joaquin River via bypass channels such as Paradise Cut and the Mariposa bypass. New bypass areas could potentially be identified and implemented. Increasing bypass of flows could be accomplished by widening the bypasses via levee setbacks, or redesign of diversion structures to maximize efficiency at specified flows.

Channel Modifications for Conveyance Improvements

This measure would be implemented for improvements to the channels of Paradise Cut or Mormon Channel. Conveyance improvements would reduce stages on the mainstem of the San Joaquin River, the Stockton Diverting Canal and Lower Calaveras River. Channel modification would entail removal of material (vegetation and soil) from within the channel to allow for greater capacity. Existing channel width would

(Excerpt 3-6)

be maintained during implementation of this measure. Removed material could potentially be used for levee improvements or would be disposed of appropriately. Currently, channel maintenance is not required under the existing Operation, Maintenance, Repair, Replacement and Rehabilitation (OMRR&R) manuals, but implementation of this measure would include updates to the OMRR&R manuals to include requirements for maintenance to maintain design capacities.

Bypass Channels

This measure involves improvements to bypass channels such as Paradise Cut and Mormon Channel. Improvements to these channels would potentially result in stage decreases on the San Joaquin River, Diverting Canal and Lower Calaveras River. Improvements to the bypass channels would include channel modifications as described above, the addition of a diversion structure at Mormon Channel and modification to the existing diversion structure at Paradise Cut. Channel modifications would include removal of vegetation and soil as required for flow efficiencies. Diversion structure modifications would include height or width changes upstream of Paradise Cut to allow maximum flows at the desired flow elevations.

Mormon Channel Control Structure

This measure would involve construction of a control structure at the upstream end of the Diverting Canal to divert flows into Mormon Channel. The control structure would consist of gated culverts placed in the Stockton Diverting Canal left bank levee to allow flow into Mormon Channel. The culverts would be sized to allow control of flows up to the design capacity of the Mormon Channel.

Levee Extensions

This measure would involve extension of the southern tie-in levee on the south end of RD 17 to an appropriate elevation to reduce flood risk in the southern Manteca area. The levee extension would be combined with repairs or improvements to the existing tie-in levee to meet current standards. Levee extension may also be implemented for the right bank levee of French Camp Slough in RD 404. The levee extensions would be built to a height equal to that of the existing levee system, or to meet the height of included improvements. Typical design for an extension levee would include a top width of 12 to 20 feet and side slopes with a ratio of 3 to 1. A cut-off wall to reduce seepage may be required depending on the geotechnical analysis of the levee foundation.

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(Excerpt 3-18)

RD17-G, SJR Setback and Tieback Extension: This alternative addresses the San Joaquin River as the flooding source, and includes a setback levee to limit protection of already developed but not urbanized flood plain within RD 17. It extends the tieback levee at the southern-most end of the RD to minimize probability of flanking during extreme high water events. The alternative covers 113,500 linear feet (21.5 miles) of levee.

(Excerpt 3-35)

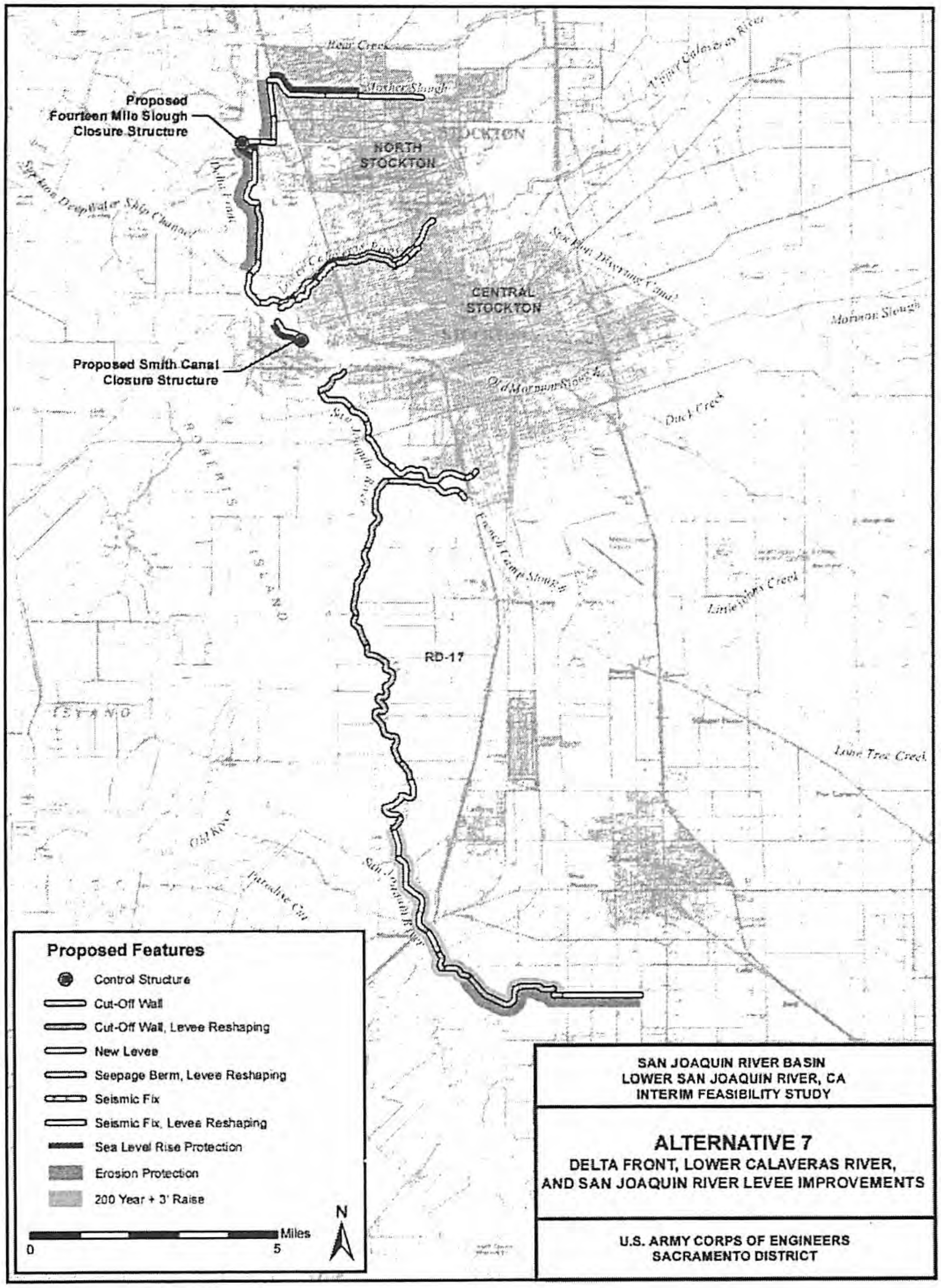

Figure 3-8. Alternative 7.

(Excerpt 3-54)

Central Stockton:

- No Action: This alternative would involve no Federal action within the base flood plain as a result of this study. No additional reductions in flood risk to the area would be realized.
- Improvement of Paradise Cut: This was screened out because the cost exceeded the benefits and because it did not address geotechnical levee failure modes.
- Flood proofing and raising existing structures and infrastructure: This was determined to not be a cost effective alternative.
- Reservoir reoperation: This alternative was screened out due to potential system-wide effects, and because it did not address geotechnical failure modes.
- Reduce geotechnical failure probability and increase height of existing levees: These measures were retained. The geotechnical issues addressed are primarily through- and under-seepage with areas on the Delta Front requiring seismic stabilization.

RD 17:

- No Action: This alternative would involve no Federal action within the base flood plain as a result of this study. No additional reductions in flood risk to the area would be realized.
- Improvement of Paradise Cut: This was screened out because the cost exceeded the benefits and because it did not address geotechnical levee failure modes.
- Flood proofing and raising existing structures and infrastructure: This was determined to not be a cost effective alternative.
- Reservoir reoperation: This alternative was screened out due to potential system-wide effects, and because it did not address geotechnical failure modes.
- Ring levees: Inclusion of ring levees may be effective in some study areas, but will need to be incrementally cost effective to be a practicable alternative.
- Set-back levees: This was determined to be cost effective for one reach in RD 17 with a length of approximately 3,500 feet.
- Reduce geotechnical failure probability and increase height of existing levees: These measures were retained. The geotechnical issues addressed are primarily through- and under-seepage with areas on the Delta Front requiring

(Excerpt 3-57)

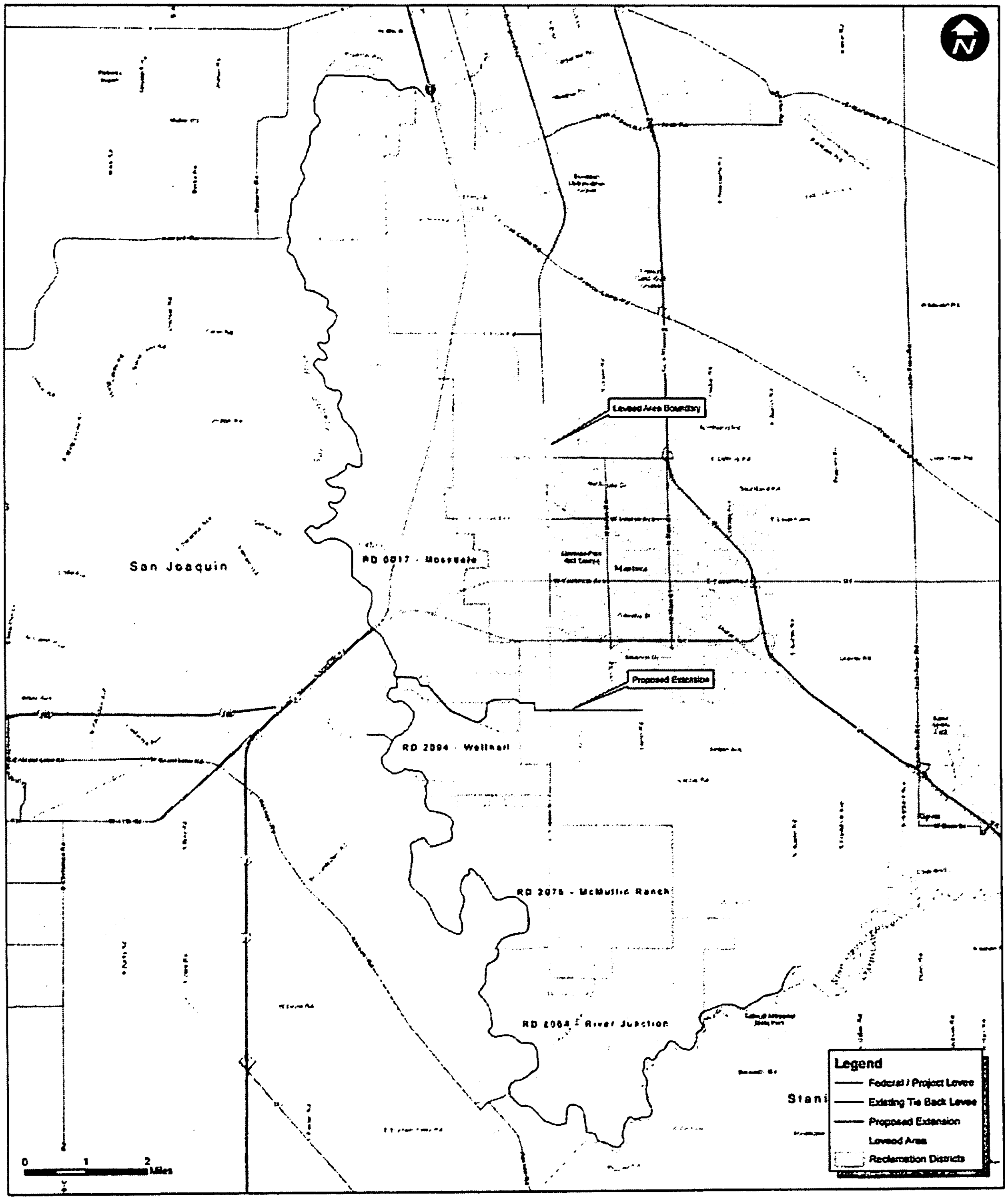

Figure 3-19. San Joaquin River East Levee System.

(Excerpt 3-63)

Figure 3-20. Existing Landuse in Study Area.

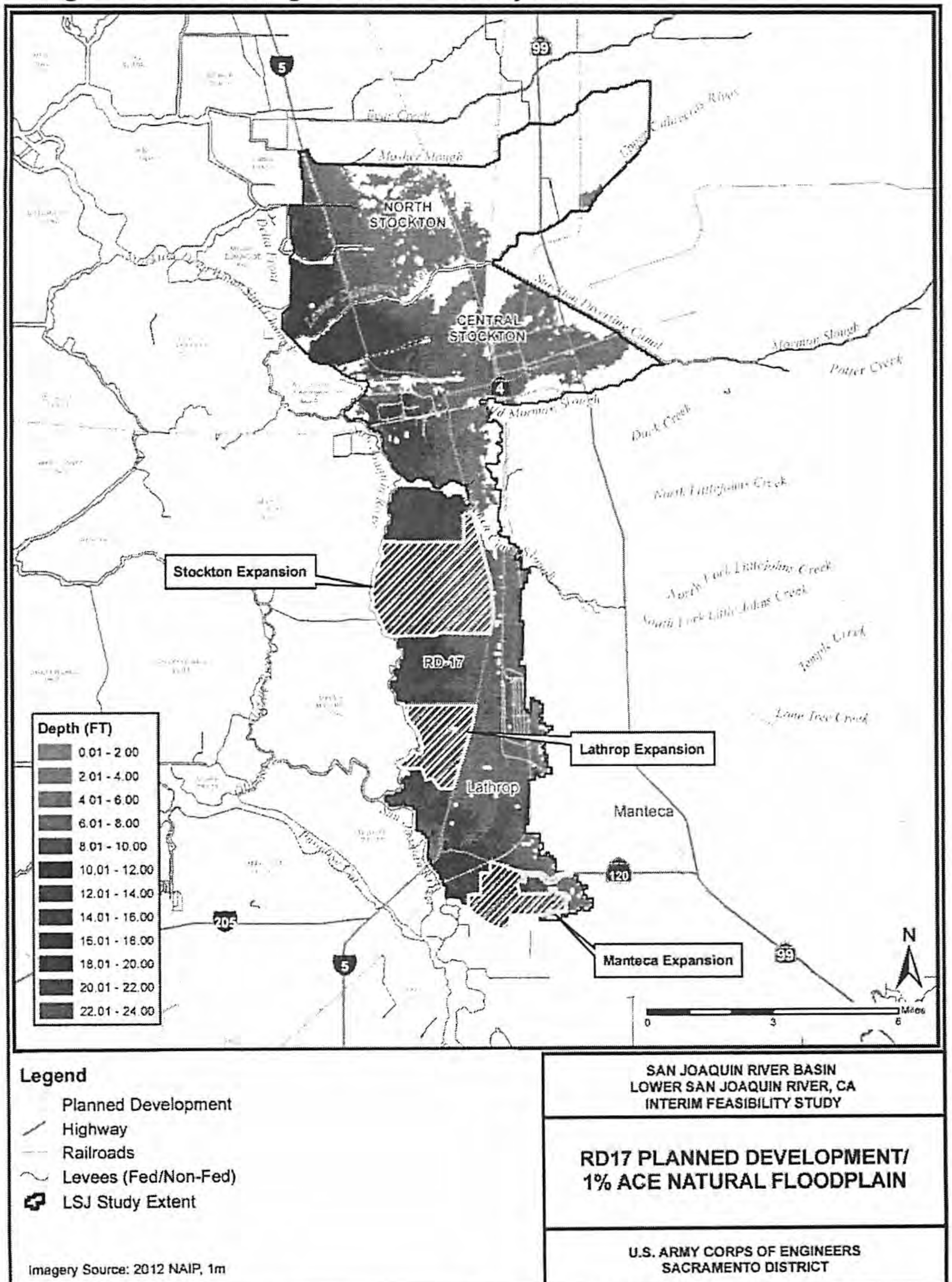

Figure 3-21. Planned Development RD 17 and 100-year Inundation Area.

(Excerpt 3-67)

alternatives for identification of the NED and TSP plans: Alternative 7a, Alternative 8a, and Alternative 9a.

It is understood that RD 17, with funding assistance from the State, is currently pursuing a phased strategy of levee improvements to initially increase the resistance of RD 17's levee system to under seepage and through seepage. Upon completion of that work, RD 17 and the non-Federal sponsors intend to pursue USACE participation in additional studies/improvements necessary to achieve the non-Federal objective of 200-year (0.5 percent ACE) flood risk management in order to meet SB 5 requirements. Consideration of future Federal participation would be subject to demonstration of a Federal interest in such incremental improvements.

3.7 Environmental Considerations and Mitigation

All appropriate environmental resources were analyzed during development of the proposed alternatives to fully comply with NEPA and CEQA. Most impacts to resources as a result of implementation of a proposed project can be mitigated, but there are challenges related to impacts to riparian habitats within the study area.

3.7.1 Regional Context

Riparian habitats are substantially reduced from their historical extents throughout the Central Valley. Only about 2-5 percent of the historic riparian habitat still exists (RHJV 2004). This is true along the San Joaquin River as well. Establishment of the FRM system, with levees set immediately adjacent to the main rivers and tributaries contributed to this decline and continues to result in conflicts between ecosystem health and sustainability and maintenance of the FRM system. Upstream of the proposed project area, considerable Federal and state investment has been made to improve the riparian corridor as part of the San Joaquin River Restoration Program and the Federal and state refuge systems.

In general, riparian communities are among the richest community types, in terms of structural and biotic diversity, of any plant community found in California. Riparian vegetation provides important ecological functions, including: wildlife habitat; migratory corridors for wildlife; pollution filtration and waterway shading, thereby improving water quality; provides connectivity between waterways and nearby uplands; and biomass (nutrients, insects, large woody debris, etc.) to adjacent waterways. Riparian forests and woodlands – even remnant patches – are important to resident and migratory fish, birds, and other wildlife.

3.7.2 Study Area

The riparian corridor in the study area is severely constrained by the proximity of the flood management levees to the rivers, tributaries and sloughs. Throughout most of the corridor vegetation is highly altered and fragmented. Nevertheless, this vegetation is all that remains as habitat to resident and migratory fish and wildlife in the proposed

(Excerpt 3-75)

Based on the information presented above, Alternative 7a is identified as the NED plan and is selected as the TSP.

3.10 THE TENTATIVELY SELECTED PLAN

The TSP is Alternative 7a, North and Central Stockton – Delta Front, Lower Calaveras River, and San Joaquin River Levee Improvements excluding RD 17 (Figure 3-12). This plan meets the study objectives of reducing flood risk and flood damages. With the TSP in place, the North Stockton impact area improves from an approximate 15% annual chance of flooding in the highest risk areas to less than 1% annual chance of flooding. The Central Stockton impact area improves from a 12% annual chance of flooding in the highest risk areas to an approximate 2% annual chance of flooding. Further information about specific annual exceedance probabilities and the performance of levees for a range of hydrologic events within sub-impact areas can be found in the Economic Appendix. However, this plan will result in no risk reduction for 43,000 people and critical infrastructure within RD 17.

The structural features of Alternative 7a include approximately 23 miles of levee improvements and two closure structures, one at Fourteenmile Slough and the other at Smith Canal. The levee improvements are comprised of a cutoff wall, deep soil mixing (seismic), a new levee, levee geometry improvements, and erosion protection.

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In addition to the structural features, the recommended plan also includes several non-structural features to further reduce the consequences of flooding. These include the following measures: Comprehensive Flood Warning Emergency Evacuation Planning and Flood Plain Management.

Table 3-19 below contains a first cost break-out for the TSP, Alternative 7a, North and Central Stockton – Delta Front, Lower Calaveras River, and San Joaquin River Levee Improvements excluding RD 17. These costs are preliminary and will change during additional analysis.

(Excerpt 4-1)

CHAPTER 4 – DESCRIPTION OF FINAL ALTERNATIVES*

4.1 INTRODUCTION

This chapter provides additional details related to the final array of alternatives identified in Chapter 3. NEPA requires a greater level of detail in order to properly analyze the potential effects of the proposed alternatives on the natural and human environment. Under NEPA, both the proposed project and the project alternatives are each analyzed at the same level. CEQA project alternatives are usually analyzed at a lesser degree than the proposed project, and the primary comparison is as an alternative to the proposed project. The common objective of both CEQA and NEPA is to identify the potential impacts on the human environment that would potentially arise if the preferred alternative is approved – and consider alternatives that could also address the purpose and objectives of the project.

NEPA and CEQA take a slightly different approach to considering alternatives to the proposed project however, both sets of environmental laws have the same overall objective – to inform the decision makers and the public of the environmental effects of a project and ways those effects could be mitigated through measures to avoid, minimize, rectify, reduce or compensate for adverse impacts.

This Chapter is followed by Chapter 5, which includes a discussion of the affected environment and the potential environmental effects of the proposed alternatives that are described below.

4.2 ALTERNATIVES CONSIDERED IN DETAIL

As discussed in Chapter 3, the Feasibility Study screened the alternative plans down to the following final array of alternatives (with options). The difference between the two options for the action alternatives is that option "a" excludes levee work in RD 17, while option "b" includes levee work in RD 17.

- Alternative 1, No Action
- Alternative 7a, North and Central Stockton, Delta Front, and Lower Calaveras River and San Joaquin River Levee Improvements (see Chapter 3, Figure 3-12)
- Alternative 7b, North and Central Stockton, Delta Front, Lower Calaveras River, San Joaquin River Levee Improvements, and RD 17 Levee Improvements (see Chapter 3, Figure 3-13)
- Alternative 8a, North and Central Stockton, Delta Front, Lower Calaveras River, San Joaquin River, and Stockton Diverting Canal Levee Improvements

(see Chapter 3, Figure 3-14)

(Excerpt 4-3)

4.3.1 Cutoff Walls

Seepage cutoff walls are vertical walls of low hydraulic conductivity material constructed through the embankment and foundation to cut off potential through- and under-seepage. In order to be effective in reducing under-seepage, cutoff walls usually tie into an impervious sub-layer. Prior to construction, the construction site and staging areas would be cleared and grubbed. The levee is typically degraded by one half the levee height to provide a sufficient working surface and prevent hydraulic fracture of the levee. The cutoff walls for the project area would be a minimum of 3-feet in width; the cutoff wall would be constructed from a working surface elevation to a design depth at least 3-feet into an impermeable layer. During construction, bentonite-water slurry is used to keep the trench open and stable prior to backfilling with the permanent wall material. Soil is mixed with bentonite (SB) and then pushed into the trench, displacing the bentonite-water slurry. After a predetermined settlement period, an impervious cap is constructed above the cutoff wall and the levee is reconstructed using suitable material (Type 1 levee fill) to the correct design elevation and current USACE levee design criteria.

The conventional slurry method for SB walls is an open trench method that uses an excavator with a long-stick boom to excavate the slurry trench. The conventional method has a maximum depth of about 70 to 80 feet. Cutoff walls in North and Central Stockton would extend up to 70 feet below the working surface elevation. Some areas in RD 17 would require cutoff walls using Deep Mixing Method and would need to be up to 120 feet below the working surface elevation. The Deep Mixing Method involves blending the existing soil with cementitious material using blade or auger based mixing tools. Figure 4-1 shows a typical plan for a cutoff wall.

THIS DISCUSSION SECTION APPEARS INCOMPLETE BECAUSE IT DOES NOT CONSIDER THE USE OF DRAINS AS OPPOSED TO, OR IN CONJUNCTION WITH, CUT-OFF WALLS TO ENHANCE STRUCTURAL PERFORMANCE DURING HIGH WATER IMPOUNDMENT PERIODS. THE CUT-OFF WALL WOULD TYPICALLY BE MORE COST-EFFECTIVE FROM THE STANDPOINT OF BUILDING AND MAINTAINING THE LEVEES BUT THE CROPS, PARTICULARLY ALMOND TREES, CAN BE FLOODED OUT IN THE ROOT ZONE IN ANY TIME OF HIGH GROUNDWATER BECAUSE THE NATURAL SUBSURFACE DRAINAGE IS LITERALLY CUT-OFF BY A CUT-OFF WALL. THIS ROOT ZONE FLOODING CAN HAPPEN EVEN IF NO ABOVE-GROUND FLOODING OCCURS. BY INSTALLING ONLY A CUTOFF WALL BARRIER UNDER THE PROPOSED LEVEES, THE CURRENT DESIGN EFFECTIVELY GUARANTEES THAT THERE WILL BE MORE PROBLEMS WITH SHALLOW ROOT ZONE FLOODING AND TREE ROOT DROWNING EVEN IF NO FLOODING WOULD HAVE OCCURRED. THIS IS BECAUSE THE MINIMAL NATURAL DRAINAGE WHICH PERIODICALLY RESULTS IN TREE KILLS WILL BE SUBSTANTIALLY WORSENED BY THE CUTOFF BARRIER. A DRAIN SYSTEM IN COMBINATION WITH THE CUTOFF WALL IS ABSOLUTELY ESSENTIAL TO LONG TERM TREE GROWTH BEHIND THE LEVEES.

MY RECOMMENDATION IS TO INSTALL A SUBDRAIN SYSTEM ON THE INSIDE TOE OF THE LEVEE WHICH WOULD MAINTAIN THE GROUNDWATER LEVEL AT LEAST 5 FEET BELOW THE BOTTOM OF THE ROOT ZONE OF THE ALMOND TREES. THE SYSTEM WOULD INCLUDE A GRAVEL INTERCEPTOR TRENCH TO WITHIN NOMINALLY 3 FEET OF THE ORIGINAL GROUND SURFACE WITH THE GRAVEL ENCAPSULATED IN FILTER FABRIC AND A PERFORATED COLLECTOR PIPE IN THE BASE OF THE GRAVEL. A DEDICATED PUMP WOULD LIFT THE COLLECTED WATER FOR DISPOSAL ELSEWHERE. THE PUMP WOULD ACTIVATE AUTOMATICALLY BY FLOAT CONTROL.

THE WATER SO COLLECTED WOULD REQUIRE DISCHARGE OFF-SITE. BECAUSE THE SHALLOW GROUNDWATER SO COLLECTED IS MORE THAN LIKELY TO CONTAIN CONSTITUENT LEVELS HIGHER THAN THE LARGE FLOOD WATERS, A WAIVER TO ALLOW AUTOMATIC DISCHARGE OF THE COLLECTED GROUNDWATER WOULD NEED TO BE OBTAINED.

4.3.2 Levee Reshaping (also called "Geometric Fix")

This measure would include reshaping the existing levees to restore them to USACE levee design criteria for side slopes and crown width. For the LSJRFS area, the minimum crest width for mainline or major tributary levees is 20 feet; the minimum crest width for minor tributary levees is 12 feet. Existing levees with landside and waterside slopes as steep as 2H:1V (i.e., for every 2 feet of horizontal distance, there is a 1 foot increase in height) may be acceptable if slope performance has been good and if the slope stability analyses determined the factors of safety to be adequate. Newly constructed levees should have 3H:1V waterside and landside slopes.

For new levees constructed in the LSJRFS area, a minimum permanent landside toe clear access easement of 20 feet is required; for existing levees within the LSJRFS area, a minimum permanent landside toe clear access easement of 10 feet is required. For both new and existing levees in the LSJRFS a minimum permanent waterside toe vegetation free zone (VFZ) of 15 feet is required unless a variance is approved by USACE.

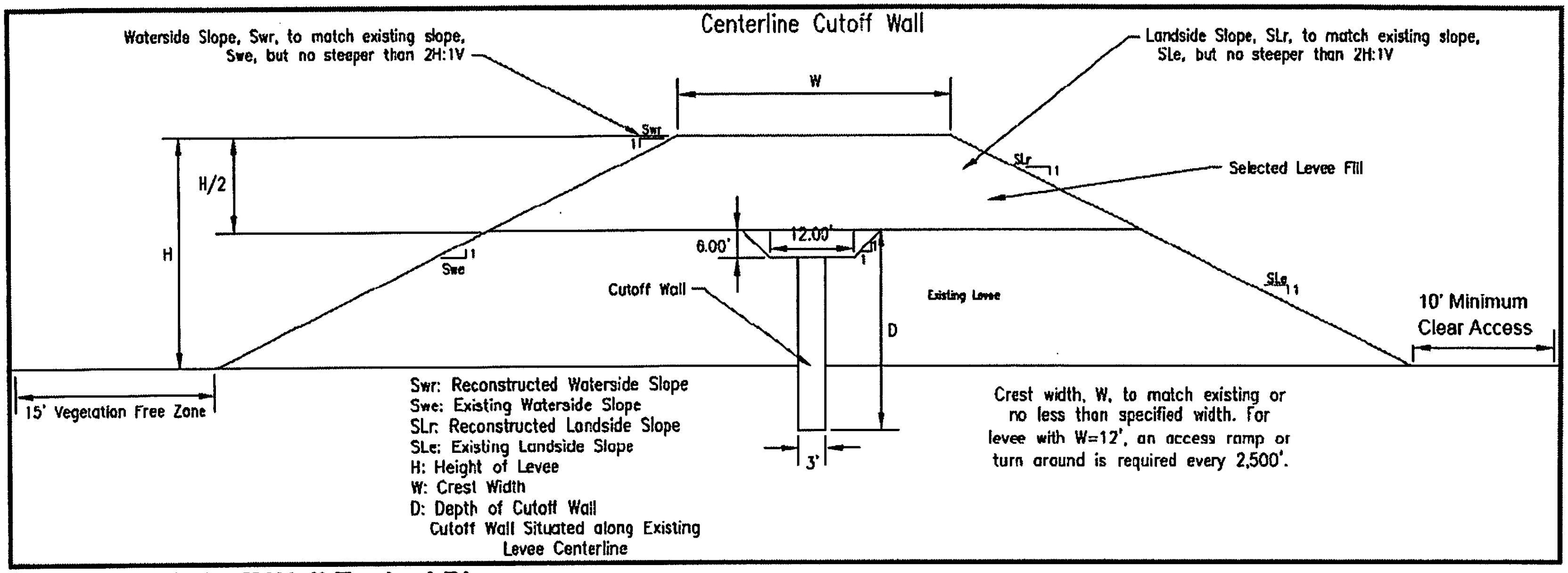


Figure 4-1. Cut-off Wall Typical Plan.

Note that the landside easement (right side) shown would be the minimum easement; landside easements would range from 10 feet to 20 feet from the levee toe.

(Excerpt 4-5)

Prior to construction, the waterside levee crest edge would be cleared and grubbed and the crown and existing landside slope would be stripped to remove at least 2 feet of material. To correct levee geometry, suitable material would be placed along the landside of existing levee slopes where needed to provide the minimum slope, required height, and crest width to meet current USACE levee design criteria, as detailed above. After construction, slopes would be hydroseeded for erosion control.

The additional area added to the landside toe by widening varies from 1 to 30 feet, depending on the existing width of the levee. The slope reshaping typical plan is shown on Figure 4-2. Slope reshaping and levee height fixes may require relocation of landside toe drains and ditches. These toe drains and ditches would be reestablished landward of the improved levee toe and would continue to function as they did before the levee improvements were constructed.

4.3.3 Levee Raise (Levee Height Fix)

This measure describes the construction action that would be taken to repair the levee height in locations where the crown has slumped and to raise the existing levee height to reasonably maximize net benefits. Where SLR was a design consideration, the height could increase up to 5 feet. An increase in levee height may require additional levee footprint area to meet design requirements for minimum levee slope and crown width. Prior to construction, the waterside levee crest edge would be cleared and grubbed and the crown and existing landside slope would be stripped to remove at least 2 feet of material. To construct a levee raise, suitable material would be placed along the crown and landside of existing levee slopes, where needed, to provide the minimum slopes, required height, and crest width that meet current USACE levee design criteria. The typical plan for a levee raise is shown in Figure 4-2.

4.3.4 Seepage Berm

Seepage berms are proposed to address levee stability, under- and through-seepage which are affecting levee performance and safety. A seepage berm is typically built adjacent to the landside of the levee and consists of layers of sand, gravel, and soil. The purpose of the berm is to control seepage flows and reduce the risk of the levee being undermined during a high-water event. The seepage berm acts as a cap, controlling the seepage flow below the berm surface and allowing the flow to reach an exit location in such a way that the undermining of levee soils is reduced or eliminated, thereby preventing boils and piping.

The seepage berm width could range from 100 to 200 feet from the landside toe of the existing levee with a maximum width of 300 feet. The seepage berms would be approximately 5 feet thick at the toe of the existing levee and would gradually slope downward to about 3 feet thick at the landside edge, with a 3:1 slope to ground level.

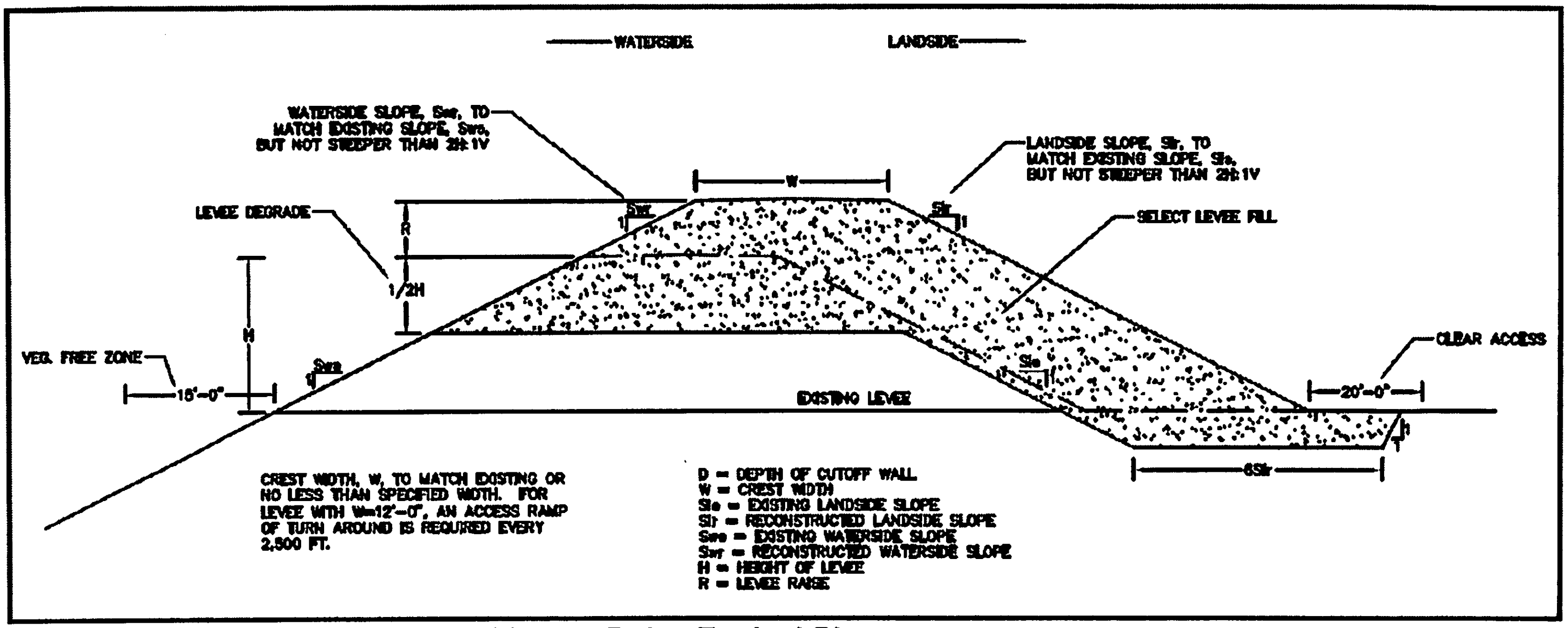


Figure 4-2. Levee Reshaping and Levee Raise Typical Plan.

Note that the landside easement (right side) shown would be the maximum clear access easement; landside easements would range from 10 feet to 20 feet from the levee toe. Half levee degradation is generally not proposed unless a cutoff wall would be installed. Instead, an internal drain may be constructed between the existing levee materials and the new fill.

(Excerpt 4-7)

Prior to construction the landside construction area would be cleared and grubbed for the new berm, right of way, and temporary easement. A layer of sand would then be placed on the natural ground surface to help eliminate the movement of fine-grained materials from underneath the levee. Gravel would then be placed on top of the sand to create a drainage layer. The drainage layer would allow the water to flow in a controlled manner and exit the face of the seepage berm to reduce the water pressure on the landside of the levee. A soil layer would then be placed on top of the gravel to further reduce the risk that seepage flows would pipe or create boils. Filter fabric would be placed between the soil and gravel layer to avoid migration of the soil into the gravel, which could clog the gravel and reduce its ability to carry seepage flows. A typical plan for a seepage berm is shown on Figure 4-3.

4.3.5 New Levee

This measure would involve constructing new levees to reduce the flood risk to some areas or to prevent waters from outflanking (i.e., flowing around the ends of the levees and entering the area intended to be protected) the existing levee system during high water events. To construct the new levees, the construction footprint area would be cleared and grubbed and a new levee foundation would be excavated. A levee inspection trench would be excavated across the entire proposed centerline of the new levee. The depth of the inspection trench would vary depending upon levee height, as required by USACE guidance and the State's Urban Levee Design Criteria (ULDC). For the purposes of the impact analysis, a depth of 3 to 6 feet is assumed.

Construction of the new levee section would proceed in accordance with USACE levee design criteria, with suitable material placed in 6- to 8-inch lifts, moistened, and compacted to design specification until the design elevation has been reached. If needed, a cut-off wall would be constructed prior to the levee construction. Once the wall was complete, the levee prism would then be constructed of impermeable fill (Type 1 levee fill material). For new levees that require erosion protection, quarry stone riprap would next be applied to armor the newly completed levee's waterside slope and provide protection against erosion. Fill material for levee construction would be obtained from local construction borrow areas and commercial sources, and would be delivered to the levee construction sites using haul trucks. A gravel road would be constructed on the crown of the new levees. Following construction, the levee slopes would be reseeded with natural grasses to prevent erosion. A typical plan for a new levee with a cutoff wall is shown on Figure 4-4.

4.3.6 Erosion Protection

This measure would consist of protection of the landside levee slopes should landward areas flood and subject the levee to wind and wave run-up of flood waters. For the purpose of this study, riprap was used to describe erosion protection features and the associated impacts. In PED, other erosion protection methodologies besides riprap may be explored.

(Excerpt 4-8)

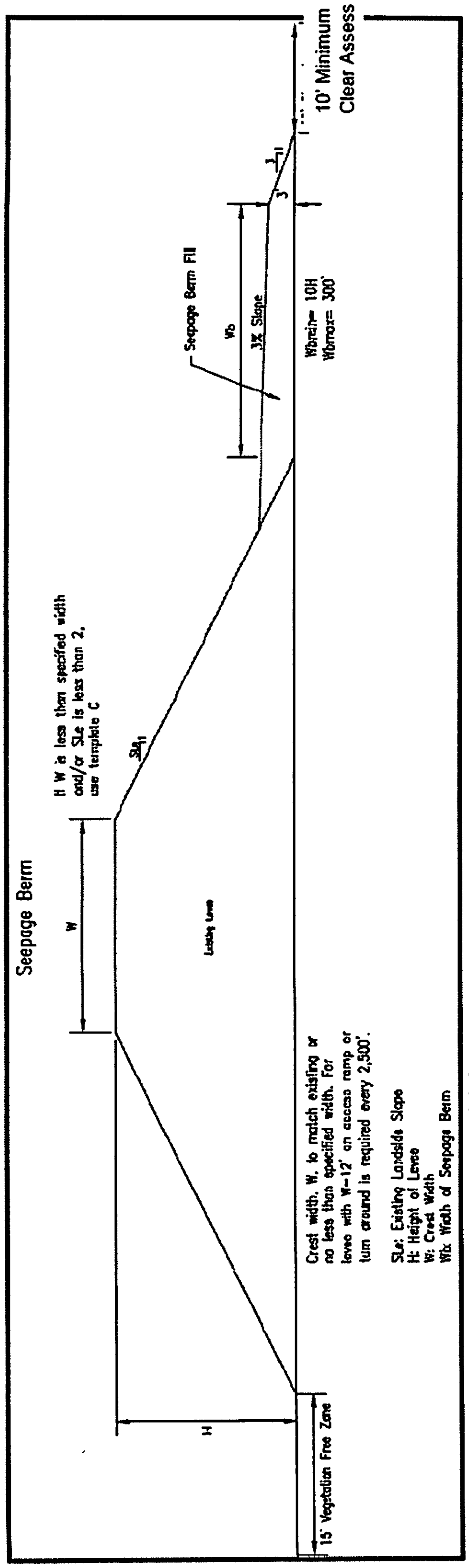


Figure 4-3. Seepage Berm Typical Plan.

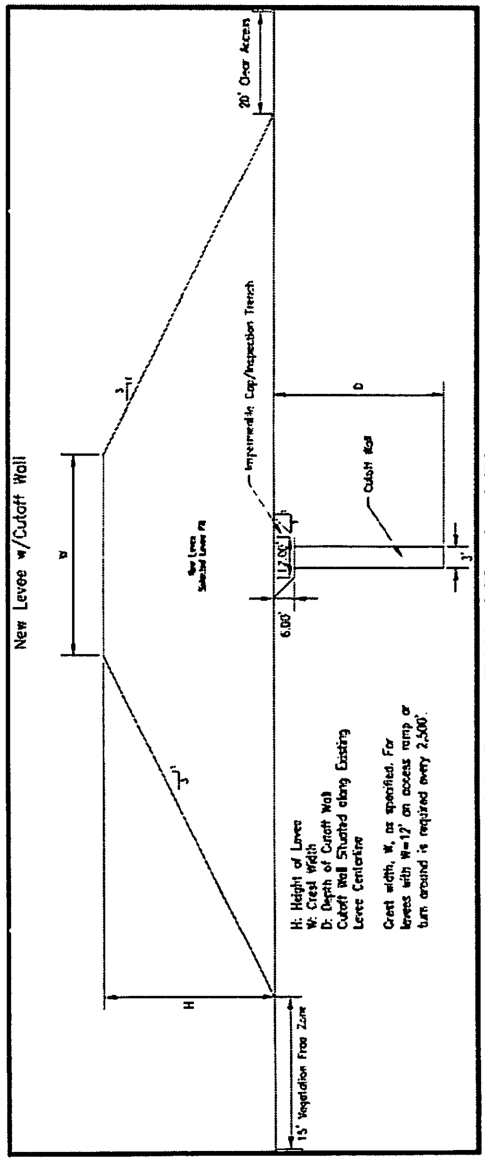


Figure 4-4. New Levee with Cut-off Wall Typical Plan.

(Excerpt 4-9)

Approximately 75,000 tons of quarry stone riprap would be imported by truck and would be placed to a thickness of 2 feet along the landside to prevent wind wave erosion during high water. A sand filter would also be placed prior to the riprap layer to prevent the migration of fines causing gravel instability and decreased erosion protection performance.

4.3.7 Floodwall

This measure consists of construction of about 825 linear feet of sheetpile floodwall from the southern portion of Dad's Point to high ground at Louise Park. The wall height would be an average of three to four feet above the ground surface. A metal cap may be placed on the top of the sheetpile or the sheetpile maybe encased in concrete. The floodwall would be approximately 12 to 18 inches wide.

4.3.8 New Bridges

This measure would consist of constructing three bridges over Old Mormon Channel to replace low water road crossings that are currently inundated periodically. This measure is included in Alternatives 9a and 9b. The measure would include removing the existing road and grading the area to allow flood flows to move unimpeded from the Stockton Diverting Canal through the Old Mormon Channel, into Mormon Slough and then into the San Joaquin River.

4.3.9 Seismic Remediation

This measure would be implemented to provide seismic stability to the Delta Front levees of North Stockton that are frequently loaded (due to slough water surface elevations that are tidally influenced) and that are also subject to potentially significant deformations due to a seismic event. The seismic (deep soil mixing) remediation measure would involve installation of a grid of drilled soil-cement mixed columns aligned longitudinally with, and transverse to, the alignment of the levee extending beyond the levee prism. This measure would minimize significant deformation of the levee during a seismic event.

The seismic remediation would involve degrading approximately the top half of the levee and placing the degraded material landward as shown in Figure 4-5. Prior to construction, the construction area would be cleared and grubbed. The material obtained from degrading the levee would extend up to 60 feet beyond the existing levee landside and would be compacted such that the material forms an extension to the existing levee. The crest of the levee would then be reconstructed with suitable material to comply with the USACE levee design criteria. A determination may be made during the future design that all of the degraded material may not be necessary to extend

(Excerpt 4-10)

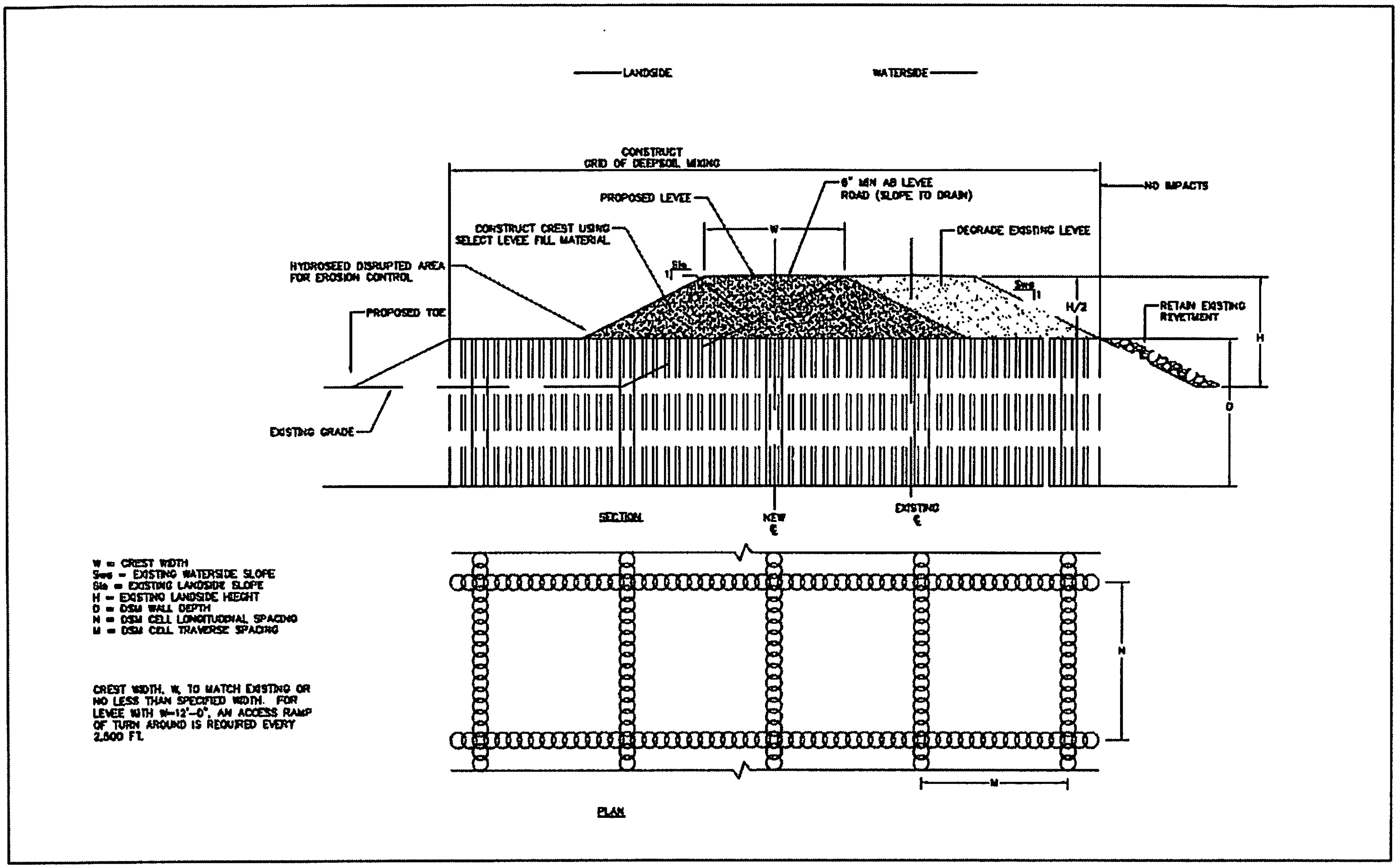


Figure 4-5. Seismic Remediation Typical Plan.

the levee to the proposed toe shown in Figure 4-5. The proposed toe could be located along an imaginary line extending from the landward face of the proposed levee to existing grade. During the current feasibility planning the maximum extent of the reconstruction berm is shown in order to show the maximum impacts which could occur.

Deep soil mixing augers would be used to construct a continuous grouping of cells spaced equally in both the longitudinal and transverse direction to the levee alignment as shown in the plan view in Figure 4-5. The deep soil mixing is a seismic strengthening feature meant to keep the levee from liquefying during seismic activity. After construction is completed, the levee crest would then be topped with a 6-inch aggregate road, and slopes would be hydroseeded for erosion control. This degrading and reconstruction effort would occur along 3 miles of Fourteenmile Slough and Tenmile Slough.

4.3.10 Closure Structures

This measure would include construction of closure structures at the mouths of backwater sloughs at Smith Canal and Fourteenmile Slough to provide flood risk management along those sloughs. The closure structures would control back - flooding from the San Joaquin River and Delta during high water events. The gates would be operated typically between November 1st to April 30th which covers the rainy season and the period when high tides occur in this area. Specifically, the gates will be operated when the high tide is forecast to reach, or exceed +8.00 ft NAVD88 to prevent high flows from entering the canal/slough. The gate would be closed at the lowest tide prior to the forecasted high tide and remain closed until the high tide begins to recede. The gate would then be opened to allow any accumulated interior drainage behind the gate structure to flow out. This would limit the level and duration of water saturation and reduce the risk of levee damage or failure. Due to the tidal influence of the Delta, high water events could last from a few days to a few weeks, depending on river conditions. During development of the alternatives, Smith Canal and Fourteenmile Slough were identified as appropriate locations for closure structures.

The proposed closure structures would consist of a fixed sheet pile wall structure with an opening gate structure sufficiently large to allow for the safe passage of boats and other watercrafts. Fish and other aquatic organisms would also be able to pass through these gates when they are open. The opening portion of the closure structure would be an automated gate that may open upward or outward. The gate would be approximately 50-feet wide, and would be constructed of stainless steel. The gate would be attached to a concrete foundation using stainless steel anchor bolts. A small building would be built on land directly adjacent to the closure structures to store equiopment required to operate the gate. As needed, a sheet pile floodwall would be constructed adjacent to the control structures to tie the structures into the adjacent levee or high ground areas.

Construction would require dredging or draglining, construction of a temporary cofferdam, in-water excavation, and placement of some structural features in the water.

(Excerpt 5-1)

CHAPTER 5 – AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES*

This chapter describes the affected environment and environmental consequences of each of the alternatives in the final array, mitigation measures for potential impacts, cumulative effects, and other environmental considerations for implementing the LSJR project.

NEPA and CEQA require that the environmental effects of a project be analyzed for significance. Under NEPA, significant impacts are impacts that are considered significant because of their context (location sensitivity) and intensity (magnitude of impact) (40 CFR Section 1508.27). Under CEQA, impacts are assessed for significance based on specific significance criteria consistent with State CEQA Guidelines Appendix G (14 California Code of Regulations 15000 et seq.). For the purposes of CEQA, potential effects are determined by assessing the potential impacts of the proposed action on the existing conditions for each resource. For the purposes of NEPA, potential project effects assessed in relation to the conditions described in the No Action Alternative. For the purpose of this impact analysis, effects are evaluated against existing conditions since these conditions either reasonably represent future conditions in the project area or because using existing conditions will facilitate full evaluation and disclosure of the greatest potential impacts of the proposed project.

The CEQA existing (baseline) environmental conditions assumed in the preparation of this chapter consist of the existing environment as of January 15, 2010, when USACE published the Notice of Intent (NOI) to prepare an EIS in the Federal Register and SJAFCA published the Notice of Preparation (NOP) to prepare an EIR with the State Clearinghouse (State Clearinghouse Number (SCH#) 2010012027). Resource conditions were reassessed and updated between fall 2013 and spring 2014. Changes in the existing conditions during that time were not substantial.

The alternatives evaluated in this chapter are described in Chapter 4. They are listed below for ease of reference:

Alternative 1 – No Action

Alternative 7a – North and Central Stockton – Delta Front, Lower Calaveras River, and San Joaquin River Levee Improvements excluding RD 17

Alternative 7b – North and Central Stockton – Delta Front, Lower Calaveras River, and San Joaquin River Levee Improvements including RD 17

(Excerpt 5-2)

Alternative 8a – North and Central Stockton – Delta Front, Lower Calaveras River, San Joaquin River, and Stockton Diverting Canal Levee Improvements excluding RD 17

Alternative 8b – North and Central Stockton – Delta Front, Lower Calaveras River, San Joaquin River, and Stockton Diverting Canal Levee Improvements including RD 17

Alternative 9a – North and Central Stockton – Delta Front, Lower Calaveras River, San Joaquin River Levee Improvements and Mormon Channel Bypass excluding RD 17

Alternative 9b - North and Central Stockton – Delta Front, Lower Calaveras River, San Joaquin River Levee Improvements and Mormon Channel Bypass including RD 17

This chapter is organized to meet NEPA requirements for determination of the overall impact of each alternative, but will also meet CEQA requirements for an impactby-impact determination of effect. The terms environmental consequences, environmental impacts, and environmental effects are considered synonymous in this analysis.

The structure of each section is described below.

- **Environmental Setting**
  - Regulatory Framework. This section lists the laws, regulations and policies that are considered in the assessment of effects on the resource. These regulatory requirements are more fully described in Chapter 7, Compliance with Applicable Laws, Policies, and Plans.
  - Existing Conditions. This section describes the environmental setting and considers the environmental conditions in the area at the time that the NOP (CEQA) and NOI (NEPA) were published (January 15, 2010). Resource conditions were reassessed and updated between fall 2013 and spring 2014.
- **Environmental Consequences**
  - Assessment Methods. This section describes the methods, models, process, and procedures, data sources, and/or assumptions used to conduct the effect analysis. Where possible, effects are evaluated quantitatively. Where quantification is not possible, effects are evaluated qualitatively.
  - Basis of Significance. This section provides the criteria used in this document to define the level at which an effect would be considered

(Excerpt 5-11)

Potential seismic hazards from a nearby moderate to major earthquake are generally classified as primary and secondary. The primary effect is fault ground rupture, also called surface faulting. Because there are no active faults in the project area and the area is not located within an Alquist-Priolo Earthquake Fault Zone, fault ground rupture is negligible. Common secondary seismic hazards include ground shaking, liquefaction, subsidence, and seiches.

Although located in an area of low seismic risk, Stockton, Manteca, and San Joaquin County require all new development and substantial renovations to comply with current seismic standards for construction. Geotechnical engineering studies are also required for major new buildings or earthworks.

Table 5 - 2. Maximum Credible Earthquake Magnitudes

Fault	Estimated Distance from Project Site	Fault Class[1]	Maximum Credible Earthquake[2]	Slip Rate (mm/yr)
Greenville Fault Zone, North Section	20 miles	B	6.6	2.0
Greenville Fault Zone, South Section	24 miles	B	6.6	2.0
Calaveras Fault – Northern Segment	34 miles	B	6.8	6
Concord- Green Valley	38 miles	B	6.2	5.0
Hayward Fault – North Segment	45 miles	A	6.4	9

Notes:
1. Faults with an "A" classification are capable of producing large magnitude (M) events (M greater than 7.0), have a high rate of seismic activity (e.g., slip rates greater than 5 millimeters per year), and have well-constrained paleoseismic data (e.g., evidence of displacement within the last 700,000 years). Class B faults are those that lack paleoseismic data necessary to constrain the recurrence intervals of large-scale events. Faults with a "B" classification are capable of producing an event of M 6.5 or greater.
2. The moment magnitude scale is used by seismologists to compare the energy released by earthquakes. Unlike other magnitude scales, it does not saturate at the upper end, meaning that there is no particular value beyond which all earthquakes have about the same magnitude, which makes it a particularly valuable tool for assessing large earthquakes.
Sources: Cao et al., 2003; Jennings 1994; Petersen et al., 1996; data compiled by USACE in 2014

<u>Liquefaction and Settlement</u>

Liquefaction is the liquefying of certain sediments during seismic ground-shaking, resulting in temporary loss of support to overlying sediments and structures. Differential settlement occurs when the layers that liquefy are not of uniform thickness, a common problem when the liquefaction occurs in artificial fills. Poorly consolidated, watersaturated fine sands located within 30 to 50 feet of the surface typically are considered the most susceptible to liquefaction. Dry soils and sediments consisting of finer grained materials are generally not susceptible to liquefaction.

(Excerpt 5-12)

Many of the levees in the project area are constructed over alluvial deposits and may be susceptible to liquefaction or degradation due to a seismic event. The area is unusual in that it contains infrequently water-saturated levees in Central and South Stockton, but also frequently saturated levees in North Stockton and Delta Front. Frequently saturated levees are likely to be sensitive to seepage, leading to breach with seismic-event induced transverse cracking or displacement.

As part of the design effort, USACE conducted liquefaction triggering analyses and identified liquefiable material along several levees in the project area. Static limit equilibrium stability analyses were then conducted for these levees. Based on the analyses, the flood protection ability after a 200-year seismic event was judged to be compromised at several locations. Thus, a large regional earthquake during a major flood event would increase the potential liquefaction, settlement, and levee failure. The greatest susceptibility is along the Delta Front and North Stockton. Details of the liquefaction analyses are included in Appendix B.

5.2.2 Assessment Methods and Basis of Significance

Assessment Methods

The types and extent of potential effects and significance were assessed by reviewing seismic fault and event maps, reviewing seismic studies, discussing seismic aspects with professional staff, and then considering the work proposed under each alternative.

Basis of Significance

- Expose people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving:
  - rupture a known earthquake fault as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault;
  - strong seismic ground shaking;
  - seismic-related ground failure, including liquefaction; or landslides.
- Be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the project, and potentially result in onsite or offsite landslide, lateral spreading, subsidence, liquefaction or collapse.

The project area is not located within or adjacent to an Alquist-Priolo Fault Zone or any known active fault. Therefore, the risk of surface fault rupture is negligible and is not evaluated further. Additionally, the project area is relatively flat, and there would be no adverse impacts related to landslides. Therefore, landslides are not addressed further.

(Excerpt 5-13)

5.2.3 Alternative 1 - No Action

Under the no action alternative, no construction activities would occur. As a result, the existing seismic faults and potential for ground movement would be expected to remain the same. Prior to the implementation of the proposed measures to reduce flood damage to the Stockton, Lathrop and Manteca area, the structural integrity of existing levees, berms, and bridges would continue to be at risk from high magnitude seismic events on active faults to the west. Some of the levees in tidally influenced areas would also continue to be at risk from seismically induced structural instability and/or failure due to liquefaction of soils. The magnitude of the impact of flooding resulting from levee failure would depend on the location of the levee breach, severity of the storm, and river flows at the time of flooding. Predicting these events and providing a determination of significance is not possible based on the information available at this time. Therefore identification of potential effects is **too speculative for meaningful consideration.**

5.2.4 Alternatives 7a, 7b, 8a, 8b, 9a, and 9b

These alternatives would have no effects on known seismic faults or cause ground movement along faults because of the type of proposed work and the nature of seismicity. The work would be limited to borrow sites activities and improvements along surface waterways, while seismic forces are subsurface and regional. In addition, there are no identified active faults in the project area.

Seismic ground shaking is an unavoidable hazard for facilities within and/or near the San Francisco Bay Area. The proposed project could experience at least one earthquake within the life of the project. Design, construction, and maintenance must comply with the regulatory standards of USACE and CVFPB, the latest industry standards and building code requirements for seismic design. The design and construction of the cut-off walls, floodwalls and/or levees would meet or exceed applicable design standards for static and dynamic stability, seismic ground shaking, liquefaction, subsidence, and seepage, minimizing the potential for significant damage.

Therefore, the existing geology and seismicity of the area would not affect the proposed project or expose people or structures to potential risk or injury.
Consistent with project objectives, the completed project would provide long-term flood risk management benefits by improving the structure and functioning of the existing levee system. This includes designing the proposed features to avoid or minimize any potential for seismic-related ground failure, such liquefaction, in tidally influence areas in the project area. As a result, none of the alternatives would cause any seismic-related ground failure, and therefore would result in no effects on seismicity.

The Geotechnical Investigation prepared for the proposed project (Appendix C) did not indicate evidence of instability because of landslides, subsidence, or collapse.

(Excerpt 5-14)

Liquefaction analysis indicates some existing levees within the project area are constructed over alluvial deposits that could be susceptible to liquefaction or degradation due to a seismic event. Design recommendations to address this condition are provided in the Geotechnical Investigation and would be implemented. The proposed project would implement standard grading and soil engineering practices to ensure that foundations are adequately supported and do not settle or otherwise fail. This includes excavating the existing soils and replacing it with compacted engineered fill. In addition, all structures associated with the proposed project would be designed in accordance with USACE, and CVFPB standards, and the provisions of the California Building Standards Code. The California Building Standards Code requirements establish minimum structural load requirements for foundations. Because project facilities would be designed, constructed and maintained in accordance with applicable standards risk of failure due to a seismic event would be minimized and this impact is **less-than-significant.**

5.2.5 Mitigation

There would be no significant effects from seismicity, therefore no mitigation is required.

5.3 SOILS AND MINERAL RESOURCES

This section describes the affected environmental and environmental consequences relating to soils and mineral resources for the LSJR project. The significance of the impacts and mitigation measures to reduce impacts are also discussed.

5.3.1 Environmental Setting

Regulatory Framework

Federal

- Clean Water Act (CWA) Section 402

State

- California Surface Mining and Reclamation Act of 1975
- National Pollutant Discharge Elimination System (NPDES) Permit
- California Building Standards Code
- California Code of Regulations: Title 23, Division 1, Article 8, Sections 111–137

Regional and Local

- San Joaquin County General Plan 2010

(Excerpt 5-16)

quarrying, and are intended to ensure that mineral resources will be available when their development is necessary or economically feasible (CDC, 2013). However, the MRZ-2 sector between Lathrop and Manteca lies outside the area that would be affected by the alternatives in the Lower San Joaquin River study.

5.3.2 Assessment Methods and Basis of Significance

Basis of Significance

- Result in substantial erosion of soil or loss of topsoil;
- Be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994), creating substantial risks to life or property;
- Have soils incapable of adequately supporting the use of septic tanks or alternative wastewater disposal systems where sewers are not available for the disposal of wastewater; or
- Result in the loss of availability of a known mineral resource of economic value to the region and the residents of the state or a locally important mineral resource recovery site delineated on a local general plan, specific plan, or other land use plan.

The project would not involve the use of wastewater disposal systems of any kind, including septic systems, and there would be no impacts. Therefore, this issue is not addressed further in this document.

5.3.3 Alternative 1 - No Action

Under the no action alternative, no construction activities would occur. As a result, the soil types and their characteristics on the alluvial fan in San Joaquin County would be expected to remain the same as deposited over time. Prior to the implementation of the proposed measures to reduce flood damage to the Stockton, Lathrop and Manteca area, water and wind erosion of exposed and recently disturbed soils would continue, and continue to weaken the structure of levees along the San Joaquin River and tributaries. The risk of levee failure and flooding would also continue, resulting in soil scouring and substantial loss of nearby valuable topsoil in the event of a breach. The eroded soils could be carried by the floodwaters and deposited in developed areas, causing damage to residences, businesses, and infrastructure. This would be considered a potentially significant effect. Implementation of USACE levee vegetation management requirements in not expected to occur under the No Action alternative, therefore removal of waterside and landside vegetation would not occur, reducing potential erosion impacts.

The magnitude of the impact of flooding resulting from levee failure would depend on the location of the levee breach, severity of the storm, and river flows at the

(Excerpt 5-17)

time of flooding. In the event of a flood, levee failures could result in soil scouring, erosion, and permanent loss of top soil in localized areas within several hundred feet of a levee breach. Depending on the location and severity of the levee failure and duration of flooding, the location and extent of damage and impacts related to soil erosion could be minor to extensive. Predicting these events and providing a determination of significance is not possible based on the information available at this time. Therefore identification of potential effects is **too speculative for meaningful consideration.**

The principal mineral resources in San Joaquin County are deposits of sand and gravel aggregate, and many companies are currently mining and processing these deposits as regulated by the State and County. Mining operations would continue to be at risk of disruption, damage, or loss of mineral resources in the event of levee failure and flooding. This disruption could affect the local economy. The substantial soil subsidence in the valley due to over-pumping of groundwater and drainage of lowlands by agricultural and municipal interests would also continue. These would be considered as potentially significant effects.

5.3.4 Alternatives 7a, 7b, 8a, 8b, 9a, and 9b

These alternatives would have no effect on the soil types or their characteristics on the alluvial fan. However, they would have short-term effects on soils in the project area during construction. These would include disturbing soils at staging areas; clearing, excavating, and clearing soils during site preparation; excavating, stockpiling, and/or removing soil material at borrow sites; and depositing and shaping soils at the work site. Table 5-3 lists the approximate area of disturbance by alternative. These activities could result in the potential for surface water to carry sediment from onsite erosion into the stormwater and local waterways or increase air-borne dust, resulting in potential effects on existing water quality and air quality. These short-term effects would increase with the increasing extent, type, and amount of work proposed under the alternatives; e.g., 7a would have fewer effects than 9b. The potential effects on water quality and air quality of the alternatives, BMPs, and mitigation measures are discussed in detail under Sections 5.5 and 5.8, respectively.

(Excerpt 5-19)

elements would be supported by a site-specific geotechnical investigation, which would include an evaluation of site soils and recommendations to ensure project elements are appropriately designed and constructed, consistent with the current California Building Code earthwork standards, and USACE and CVFPB standards. With adherence to the current California Building Code and any additional recommendations of the sitespecific geotechnical investigation, impacts associated with potential adverse soils conditions would be **less-than-significant**, and no mitigation is required.

These alternatives would have no short-term or long-term effects on the acquisition, mining, or processing of the mineral resources in the project area. None of the existing sand and gravel mining or processing operations are located at the work sites. Implementation of the project would not reduce or eliminate availability of mineral resources. However, consistent with the project objectives, the completed project would provide long-term flood risk management benefits by improving the structure and functioning of the existing levee system. This would include reducing the potential for loss of soils or mineral resources due to erosion and levee failure. The potential loss of locally or regionally significant mineral resources would be a **less-than-significant** impact. No mitigation would be required.

To identify potential locations for borrow material, soil maps and land use maps were obtained for a 25-mile radius surrounding the project area. Whenever possible, borrow sites would be obtained from willing sellers and located on land to minimize effects on the environment. Once details of borrow locations have been finalized, coordination with the California Department of Conservation (CDC) State Mining and Geology Board (SMGB) would occur to ensure compliance with the SMARA, as stated in Chapter 4, including any additional permitting, CEQA (as determined by the SMARA lead agency (SMGB), or NEPA required prior to commencing surface mining at the borrow sites. After material is extracted, borrow sites would be returned to their existing use whenever possible.

5.3.5 Mitigation

There would be no significant effects on soils and mineral resources, therefore no mitigation is required.

5.4 HYDROLOGY AND HYDRAULICS

This section describes the affected environmental and environmental consequences relating to hydrology and hydraulics for the LSJR project. The significance of the impacts and mitigation measures to reduce impacts are also discussed.

(Excerpt 5-23)

narrows to approximately 500 feet. However, there is one oxbow reach where the floodway is approximately 2,000 feet wide. Flood stages within this reach are dominated by runoff from the San Joaquin River.

Approximately 1 mile downstream of Paradise Cut on the right bank is Wetherbee Lake and the upstream tieback levee of RD 17. The Wetherbee Lake levee segment along the San Joaquin River was a feature of the San Joaquin Flood Control Project which cut off Walthall slough from the San Joaquin River to reduce damages to a resort development along the river. The RD 17 tieback levee is located downstream of Walthall Slough and extends east along the right bank of the slough to high ground. The RD 17 tieback levee is higher than the right bank levee of the San Joaquin River and diverts any floodwaters on the right overbank back into the San Joaquin River. This situation occurred in the flood of January 1997 and is shown on Plate 10. Flood stages within this channel reach are dominated by runoff from the San Joaquin River. Flood stages in the right overbank are dominated by runoff from the San Joaquin River and

Stanislaus River.

Old River to French Camp Slough. Old River defines the upstream extent of this reach. Old River is a distributary from the San Joaquin River and conveys floodwaters west into the Sacramento-San Joaquin Delta. There is no hydraulic structure to manage the flow split. The flow split is defined by the hydraulic characteristics of Old River and the San Joaquin River downstream of the flow split.

Within this reach the San Joaquin River further transitions to a less sinuous plan form. The main channel varies in width from 200 to 300 feet. The floodway is contained by left and right bank levees that are approximately 10 to 15 feet tall. From Burns Cutoff to approximately 4 miles downstream, the right bank levee is approximately 3 feet taller than the left bank. The floodway width between the levees varies from 300 feet to 400 feet and widens to 1,400 feet at a few meander bends. The waterside levee face forms the channel bank along most of this reach. Flood stages within this reach are dominated by runoff from the San Joaquin River.

French Camp Slough to Burns Cutoff. French Camp Slough defines the upstream extent of this reach. French Camp Slough is a tributary to the San Joaquin River. The reach characteristics of French Camp slough are described below. The main channel varies in width from 200 to 300 feet. The floodway is contained by left and right bank levees that are approximately 10 to 15 feet tall. The floodway width between the levees varies from 300 feet to 400 feet. The waterside levee face is next to the channel bank along most of this reach. Flood stages within this reach are dominated by runoff from the San Joaquin River. However, influence of ocean tides is evident in flood stage hydrographs.

Burns Cutoff to Deep Water Ship Channel. Burns Cutoff defines the upstream extent of this reach. Burns cutoff is a secondary channel of the San Joaquin River which conveys water on the west side of Rough and Ready Island. Burns cutoff flows

RICHLAND

April 13, 2015

Tyler Stalker
U.S. Army Corps of Engineers
1325 J Street, Room 1513
Sacramento, CA 95814
Stockton, CA 95202-2317

Subject: Lower San Joaquin River Draft Feasibility Study; Applicability of EO 11988 to Reclamation District 17

Dear Mr. Stalker:

I am responding to the Lower San Joaquin River Draft Feasibility Study released by the U.S. Army Corps of Engineers (USACE). Please accept this letter as formal comments from Richland Communities, Inc., (Richland) regarding this draft document to be considered by USACE Headquarters. The identified overall purpose of the Lower San Joaquin River Feasibility Study (LSJRFS) is to "reduce flood risk to urban and urbanizing parts of the study area. The Non-Federal Sponsors' objective is to meet the requirements of California Senate Bill (SB) 5 of 2007, the Central Valley Flood Improvement Act, to achieve a 200-year level of protection for the urban and urbanizing areas within the Study Area."

20-1 Richland disagrees with selection of Alternative 7a as the Tentatively Selected Plan (TSP). We do not believe that Alternative 7a will adequately meet the flood risk reduction objective or the 200-year level of protection objective. We are asking that RD17 Alternatives not be removed from further consideration in the Draft Feasibility Study (7b, 8b, 9b). If not removed from the Feasibility Study, we believe Alternative 7b would become the TSP and would include RD17 improvements. We understand the USACE can change the TSP in the Final Feasibility Study. The potential impacts of the entire array of alternatives included 7b, 8b and 9b that all included the RD17 improvements. All potential impacts of RD17 improvements are documented and analyzed in the Draft EIS/EIR, so the USACE can determine in the Final LSJRFS that the TSP has changed to Alternative 7b. We are asking that the USACE to make this change. If RD17 Improvements are not in the TSP, 43,000 existing people remain at risk as well as millions of dollars of critical infrastructure that has already been spent.

20-2 As a major property owner in the Cities of Lathrop and Manteca, we have invested tens of millions of dollars and have worked hand-in-hand with the Cities, RD 17 and other agencies to ensure the viability of our assets and that good and responsible planning has occurred. We control the remaining assets within the Crossroads Commerce Center (an industrial park in the City of Lathrop that is 75% built out); 315-acres currently being entitled for industrial in South Lathrop; and residential zoned land within phase II of the

Central Lathrop Specific Plan. To deny the area the ability to meet the 200-year level of protection objective will have an adverse economic impact on not only Richland, but the region as a whole. The requirements of SB5 have already weakened any serious interest in available properties. All interested parties want to see more progress in meeting SB5 and when you add to it the unknowns related to Executive Order (EO) 11988, there is no interest in doing business in these markets. Richland, along with other developers may be forced to abandon their projects, some fully entitled, which will adversely impact the Cities of Lathrop and Manteca if 200-year flood protection improvements are not permitted.

Historically, RD17 levees have been endorsed by Congress, the USACE and by FEMA to provide protection for development. We fail to understand why the USACE chose a different analysis methodology to determine that the RD17 levees do not provide 100-year flood protection, when those levees have been certified by FEMA for 25 years. Richland is concerned with the recent statements by the USACE that the FEMA
20-3 certification may not be relied upon regarding RD17 levees. The USACE interpretation of EO 11988 appears overstated when they state the RD17 levees do not provide 100-year flood protection and should not be improved to provide 100-year protection. We would like to understand the impact of this EO 11988 interpretation on proposed large, federally funded projects within RD17. We would also like to understand the impact on Federal facilities in RD17 if levees cannot be improved to provide 200-year flood protection.

After decades of responsible development; growth in both housing and job sectors; and both federal and state investments in the region (roadways and federal facilities), it appears the USACE is saying "no" to 200-year flood protection. If this is the direction,
20-4 there needs to be a serious conversation regarding the "taking" of property. Both non-residential and residential projects already entitled will not be built and areas both partially and fully entitled will be abandoned. The post-economic impact of the decisions related to the TSP and EO 11988 will have their own environmental impacts to the region that, in our opinion, have not been adequately addressed and warrant discussion (i.e., increased flood hazard risk; blight caused by socio-economic changes resulting
20-5 from the failure of major developments being finished; air quality and climate change impacts related to increases vehicle miles traveled as people seeking jobs and housing in the RD17 area must commute further distances to find those opportunities, etc...).

In summary, Lathrop's and Manteca's land within the limits of RD 17 have already been flood protected, approved for development, annexed, and has urban infrastructure in place to serve existing and planned growth. We believe that inclusion of this land within
20-6 the Lower San Joaquin River Feasibility Study should not conflict with EO 11988. If you have any questions regarding this letter, please feel free to call me at (209) 662-5098 or trevorsmith@richlandcommunities.com.

Sincerely,

Trevor Smith
Central Valley Manager

April 13, 2015

Ms. Tanis Toland

U.S. Army Corps of Engineers

1325 J Street

Sacramento ,CA 95814-2922

Comments on LSJRFS study

My name is Anthony Barkett and I am a landowner in RD 17. My property is located in southwest Manteca. It consists of approximately 75 acres and is zoned residential. It has an approved tentative map and has been in the City since 2007.

21-1 I object to RD 17 being excluded as an alternative due to concerns over executive Order 11988 and the unwise development in the floodplain. The Corps should reconsider their conclusion and study alternatives 7b or 8b as the preferred alternative .

I have a few comments and would like some questions answered as to how the Corps came to this conclusion.

21-2

1. I would like a complete answer as to why RD 17 is considered to be in the floodplain. Comments by both RD 17 and SJAFCA make compelling arguments as to why RD 17 should not be considered in the floodplain and as a result, not subject to EO 11988. Please explain the basis for including RD 17 in this analysis.

21-3

2. RD 17 is and has been developed with the cooperation of the USACE and the Federal Government for over 150 years. Why abandon the 43,000 people and the billions in infrastructure invested now?

21-4

3. How did the federal government make the decision to invest 325 million in a new VA hospital in Rd 17 yet, the Army Corps has concluded there is no Federal interest in spending money to protect RD 17 or even studying alternatives that include RD 17.

21-5

4. What is the exact criteria used to determine that RD 17 should be subject to EO 11988 and that in fact, this is an unwise use of the floodplain? Was that same criteria used in North and Central Stockton? Natomas?

21-6

5. There are several references made to the fact that there is 12,000 acres of undeveloped land that can be urbanized. Is there a difference between commercial and industrial development in the eyes of the Corps when they evaluate EO 11988 compliance? Is there any kind of ratios or real statistical guidelines that can be used by local governments to avoid the conclusion of an unwise use of floodplains.

6. The City of Stockton is reviewing their current General plan. They have over 3000 acres in RD 17
that is pre zoned for residential. If they removed that designation from residential to agriculture,
21-7 would that change the Corps conclusion that this is the unwise use of the floodplain? What if it
was changed to industrial? Would that change the conclusion or require a new analysis?
7. There are several references that state" based on existing land use planning further inducing
development in RD 17 in the deepest parts of the flood plain, the decision was made to remove
RD 17 alternatives from further consideration". Specifically, what land use planning are you
referring to? Stockton General Plan? Lathrop general Plan? What exact area within RD 17 are
21-8 you referring to when you say the deepest parts of the floodplain? If these area were removed
from development or changed to industrial zoning, would this change the corps conclusion?
Please be as specific as possible because local agencies should be entitled to know the thinking
and exact criteria that goes into making these conclusions.
8. Has the Corps ever denied a 408 permit based on EO 11988? Can you state in the last 10 years
21-9 how many 408 permits had an EO11988 analysis and how many, if any, were rejected as a result
of EO 11988?

Thank you for your consideration of my comments and questions. I can be reached via email at [redacted] or at [redacted]

Sincerely,

Anthony Barkett

Neighbors United

% MIKE F. BABITZKE, INC. 6 SOUTH EL DORADO, SUITE 305 STOCKTON, CA 95202

April 8, 2015

Ms. Tanis Toland
US Army Corps of Engineers, Sacramento District
1325 J Street
Sacramento, CA 95814-2922

Re: Public Comments Relating to the San Joaquin River Basin Lower San Joaquin River, CA DRAFT Integrated Interim Feasibility Report/Environmental Impact Statement/Environmental Impact Report dated February 2015

Dear Ms. Toland:

Neighbors United (NU) is a California non-profit corporation with a focus on growth and environmental issues.

For several months now, NU has been active in attending Manteca City Council meetings for the purpose of better understanding any and all impacts associated with any proposed repairs or improvements to the current flood protection levee system located in an area generally recognized as southwest Manteca.

As part of that effort, NU is in receipt of three Environmental Impact Report documents describing the potential for future flood protection levee projects meant to protect the planned urban expansion of Manteca:

A. US Army Corps of Engineers, Sacramento District "*San Joaquin River Basin Lower San Joaquin River, CA DRAFT Integrated Interim Feasibility Report/Environmental Impact Statement/Environmental Impact Report*" dated February 2015 ("**San Joaquin River Basin Lower San Joaquin River Feasibility Report**")
B. Reclamation District No. 17 (Prepared by AECOM) "*Final Environmental Impact Report Phase 3-RD 17 Levee Seepage Repair Project*" dated March 2015 (SCH #2010042073) (**"FEIR Phase 3-RD17 Levee Seepage Repair Project"**)
C. San Joaquin Council of Governments "*Final Programmatic Environmental Impact Report/Regional Transportation Plan and Sustainable Communities Strategy for San Joaquin County*" dated June 2014 (SCH #2013022012) (**"SJCOG FEIR RTP/SCS"**)

NU has reviewed the relevant portions of each of the documents received and recognizes the public benefit that increased flood protection will afford to the urban areas of Manteca. However, NU has identified four potential adverse affects that the proposed levee seepage repairs and/or future SB5 flood protection levee compliance improvements may impose in the flood hazard area south of the levee.

1. <u>Water Displacement and the Potential for Increased Base Flood Elevations</u>:

NU draws your attention to page 4.13-60 of the Draft Programmatic Environmental Impact Report Regional Transportation Plan & Sustainable Communities Strategy for San Joaquin County dated March 2014[1], which states:

> *"A portion of the transportation projects included in the proposed 2014 RTP/SCS could occur within the 100-year flood hazard area, thus increasing the potential to obstruct or exacerbate floodwaters. The construction of projects involving support structures in the floodway could obstruct floodwaters at some locations. Placement of structures within a floodplain can displace floodwaters and alter the base flood elevations in the surrounding areas. Structure can form a backwater effect, resulting in an increase in the flood elevation level upstream and in neighboring areas. Likewise, floodwaters can cause scour effects, resulting in erosion and sedimentation problems downstream from structures. Drainage areas could be altered by highway corridors, in which floodwater could be detained by*
> 22-1 *medians and along the roadside. Proposed bridge supports could block debris in waterways, creating obstructions and further elevating upstream flood levels. The Plan could alter existing drainage patterns or substantially increase the rate or amount of surface runoff in a manner that would result in flooding or produce or contribute runoff water that would exceed the capacity of existing or planned storm water drainage systems."*

In addition, the San Joaquin River Basin Lower San Joaquin River Feasibility Report describes an eastern levee extension route detailed on pages 3-35 and 3-57. **(See Exhibits "1" and "2")**

Further, the San Joaquin County Office of Emergency Services distributed a Flood Contingency Map dated April 2011 which clearly shows the specific areas affected by prior flooding. **(See Exhibit "3")**

With this in mind, NU's comment is to request that a priority emphasis be placed on identifying an ultimate eastern Reclamation District No. 17 ("**RD17**") levee extension footprint route that follows higher ground elevations as the levee moves to the east, so as to minimize the potential impacts due to the displacement of flood waters affecting residents and property owners located in the flood hazard area.

2. <u>Seepage Control Mechanisms and the Potential to Affect Changes in Elevation to the Groundwater Table</u>

The documents reviewed further indicate that the proposed levee seepage repairs and improvements
22-3 may involve levee seepage control mechanisms installed under the levee in the form of cut off walls reaching depths of up to 80 feet deep that may cause changes in elevation to the groundwater table.

[1] This portion of the Draft EIR is included as part of the Final Programmatic Environmental Impact Report/Regional Transportation Plan and Sustainable Communities Strategy for San Joaquin County dated June 2014 (SCH #2013022012)

Several almond orchards and other farms are located along the southern edge of the existing RD17 levee as well as other farming operations in areas located to the east that are under consideration as sites for a future levee.

Like many properties located in close proximity to the San Joaquin River, groundwater in the area around southwest Manteca is very shallow which makes the root system of almond trees vulnerable to damage if flooded due to higher groundwater elevations.

Further, the FEIR Phase 3-RD17 Levee Seepage Repair Project specifies on page ES-8 that no cut off walls are being considered on RD17 levee element areas VIII, IX, X or XI. (**See Exhibit "4"**)

With this in mind, NU's comment is to request that the entire RD17 levee extension be constructed without any levee seepage control mechanisms involving cut off walls or any other control mechanism that could cause localized change to surface groundwater levels. (**See Exhibit "5"**)

3. **Protecting Agricultural Resources**:

The documents reviewed identify certain protections for farmland under the Farmland Protection Policy Act (7 U.S.C. 4201, et. seq.) as detailed in the San Joaquin River Basin Lower San Joaquin River Feasibility Report on pages 7-6 and 7-7. (**See Exhibit "6"**)

Further, the FEIR Phase 3-RD17 Levee Seepage Repair Project provides extensive farm protection related information on pages 3.2-1 and continuing through 3.2-20 of the report.

22-3

With this in mind, NU's comment is to request that to the greatest extent possible, every effort is made to comply with the City of Manteca policies specified on pages 3.2-4 and 3.2-9 of the FEIR Phase 3-RD17 Levee Seepage Repair Project (**See Exhibit "7"**) and further listed below:

City of Manteca General Plan

The *City of Manteca General Plan 2023 Policy Document* (City of Manteca 2003), Resource Conservation Element, Goal RC-9, promotes the continuation of agricultural uses in the Manteca area and discourages the premature conversion of agricultural land to nonagricultural uses, while providing for the urban development needs of Manteca. Policies relevant to the proposed project include the following:

► **Policy RC-P-19:** The City shall support the continuation of agricultural uses on land designated for urban use, until urban development is imminent.

► **Policy RC-P-20:** The City shall provide an orderly and phased development pattern so that farmland is not subjected to premature development pressure.

► **Policy RC-P-21:** In approving urban development near existing agricultural lands, the City shall take actions so that such development will not unnecessarily constrain agricultural practices or adversely affect the viability of nearby agricultural operations.

► **Policy RC-P-23:** Protect designated agricultural lands, without placing an undue burden on agricultural landowners.

► **Policy RC-P-24:** Provide buffers at the interface of urban development and farmland in order to minimize conflicts between these uses.

► **Policy RC-P-26:** The City shall restrict the fragmentation of agricultural land parcels into small rural residential parcels except in areas designated for estate type development in the General Plan Land Use Diagram.

► **Policy RC-P-27:** The City shall discourage the cancellation of Williamson Act contracts outside the Primary Urban Service Boundary line.

In particular, NU requests that the buffers described in Policy RC-P-24 include the construction and
installation of protective fencing as provided for in Chapter 8, Section 8.8.2 under the City of Manteca
General Plan Resource Conservation Policy RC-I-30 (**See Exhibit "8"**) and that the provisions specified
22-4 by the City of Manteca in Policy RC-P-26 restricting the fragmentation of agricultural lands allow for the
routing of any RD17 levee extension in south Manteca to take into consideration farm impacts relating to
the division of farm properties into smaller parcels that may result in those properties becoming
impractical to farm.

Most important, NU requests that in association with the provisions stated on page 3.2-16 of the FEIR
Phase 3-RD17 Levee Seepage Repair Project relating to the disturbance or removal of agricultural
infrastructure, such as wells, pipelines and drainage canals, NU requests that all infrastructure affected
22-5 during the project be restored as soon as possible to guard against any damage to the crop or farm
property. (**See Exhibit "9"**)

4. <u>**Minimizing Flood Risks in the Flood Hazard Areas South of the Current RD17 Levee System**</u>:

The documents reviewed, further indicate that the proposed RD17 levee seepage repairs may involve improvements to the area in and around the Weatherbee Lake/Turtle Beach Resort area.

This area is further identified in the FEIR Phase 3-RD17 Levee Seepage Repair Project as being part of a Flood Hazard Area located adjacent to and south of RD17 levee element locations VIIe and VIIg. (**See Exhibit "10"**)

22-6

This is significant, because historically, for levee breaks south of Manteca, flood water runoff severe enough to impact the Walthall Slough Reclamation District No. 2094 area generally returns to the San Joaquin River in the area where Walthall Slough and the San Joaquin River converge. (**See Exhibit "11"**)

This point of convergence is further identified as being situated in and around the Weatherbee Lake/Turtle Beach Resort area which is protected in part by Reclamation District No. 2096.

In addition, it is widely understood that in past floods a relief cut has been made to the levees south of the Turtle Beach Resort to allow rising flood waters accumulating against the land side of the levee to drain back into the San Joaquin River.

Further, the 2011 San Joaquin County Office of Emergency Services Flood Contingency Map (**See Exhibit "3"**) clearly demonstrates the extent that south Manteca was impacted by flood waters in 1997.

The map includes a contour line indicating the extent that 1997 flood waters reached with the understanding that flood water impact was limited in its extent due to a relief cut being made to the levee in the area south of the Turtle Beach Resort area.

It is important to add that the portion of levee that received the relief cut has been repaired at a considerable cost which would need to be re-performed each and every time a future flood requires a relief cut to be made to that same portion of levee.

With this in mind, NU's comment is to request that consideration be made to construct gate opening/closure structures to be put in place at the Turtle Beach relief cut levee location area as detailed on pages 4-11 and 4-13 of the San Joaquin River Basin Lower San Joaquin River Feasibility Report. **(See Exhibit "12")**

In this way, flood waters can be efficiently drained as necessary to prevent those land side flood waters from reaching elevations that exceed those of the San Joaquin River.

This will result in protections being put in place that can ensure that future impacts due to flooding can be limited by the best means possible.

In closing, NU thanks you for the opportunity to provide the comments presented in this letter.

Please contact me if you have any questions.

Yours truly,

NEIGHBORS UNITED

Kerry Harris

Kerry Harris/President Elect

KH/jas

Enclosures:

1) Ex. "1": US Army Corps of Engineers, Sacramento District "*San Joaquin River Basin Lower San Joaquin River, CA DRAFT Integrated Interim Feasibility Report/Environmental Impact Statement/Environmental Impact Report*" dated February 2015; Page 3-35
2) Ex. "2": US Army Corps of Engineers, Sacramento District "*San Joaquin River Basin Lower San Joaquin River, CA DRAFT Integrated Interim Feasibility Report/Environmental Impact Statement/Environmental Impact Report*" dated February 2015; Page 3-57
3) Ex. "3": San Joaquin County Office of Emergency Services "*SJ County Flood Contingency Map, RD 2064, 2075, 2094 & 2096, SJ River East Bank*" dated April 2011
4) Ex. "4": Reclamation District No. 17 (Prepared by AECOM) "*Final Environmental Impact Report Phase 3-RD 17 Levee Seepage Repair Project*" dated March 2015 (SCH #2010042073); Page ES-8
5) Ex. "5": US Army Corps of Engineers, Sacramento District "*San Joaquin River Basin Lower San Joaquin River, CA DRAFT Integrated Interim Feasibility Report/Environmental Impact Statement/Environmental Impact Report*" dated February 2015; Pages 3-4, 4-3, 4-4, 4-5, 4-6, 4-7, 4-8, 5-54 and 5-55
6) Ex. "6": US Army Corps of Engineers, Sacramento District "*San Joaquin River Basin Lower San Joaquin River, CA DRAFT Integrated Interim Feasibility Report/Environmental Impact Statement/Environmental Impact Report*" dated February 2015; Pages 7-6 and 7-7
7) Ex. "7": Reclamation District No. 17 (Prepared by AECOM) "*Final Environmental Impact Report Phase 3-RD 17 Levee Seepage Repair Project*" dated March 2015 (SCH #2010042073); Pages 3.2-4 and 3.2-9
8) Ex. "8": City of Manteca "*General Plan 2023, Policy Document*" Adopted October 6, 2003; Pages 8-10 and 8-11 (Resource Conservation); Pages 8-10 and 8-11
9) Ex. "9": Reclamation District No. 17 (Prepared by AECOM) "*Final Environmental Impact Report Phase 3-RD 17 Levee Seepage Repair Project*" dated March 2015 (SCH #2010042073); Page 3.2-16
10) Ex. "10": Reclamation District No. 17 (Prepared by AECOM) "*Final Environmental Impact Report Phase 3-RD 17 Levee Seepage Repair Project*" dated March 2015 (SCH #2010042073); Page 2-25
11) Ex. "11": US Army Corps of Engineers, Sacramento District "*San Joaquin River Basin Lower San Joaquin River, CA DRAFT Integrated Interim Feasibility Report/Environmental Impact Statement/Environmental Impact Report*" dated February 2015; Page 5-23
12) Ex. "12": US Army Corps of Engineers, Sacramento District "*San Joaquin River Basin Lower San Joaquin River, CA DRAFT Integrated Interim Feasibility Report/Environmental Impact Statement/Environmental Impact Report*" dated February 2015; Pages 4-11 and 4-13

Neighbors United

% MIKE F. BABITZKE, INC.   6 SOUTH EL DORADO, SUITE 305   STOCKTON, CA 95202

Ex. "1":

US Army Corps of Engineers, Sacramento District "*San Joaquin River Basin Lower San Joaquin River, CA DRAFT Integrated Interim Feasibility Report/Environmental Impact Statement/Environmental Impact Report*" dated February 2015; Page 3-35

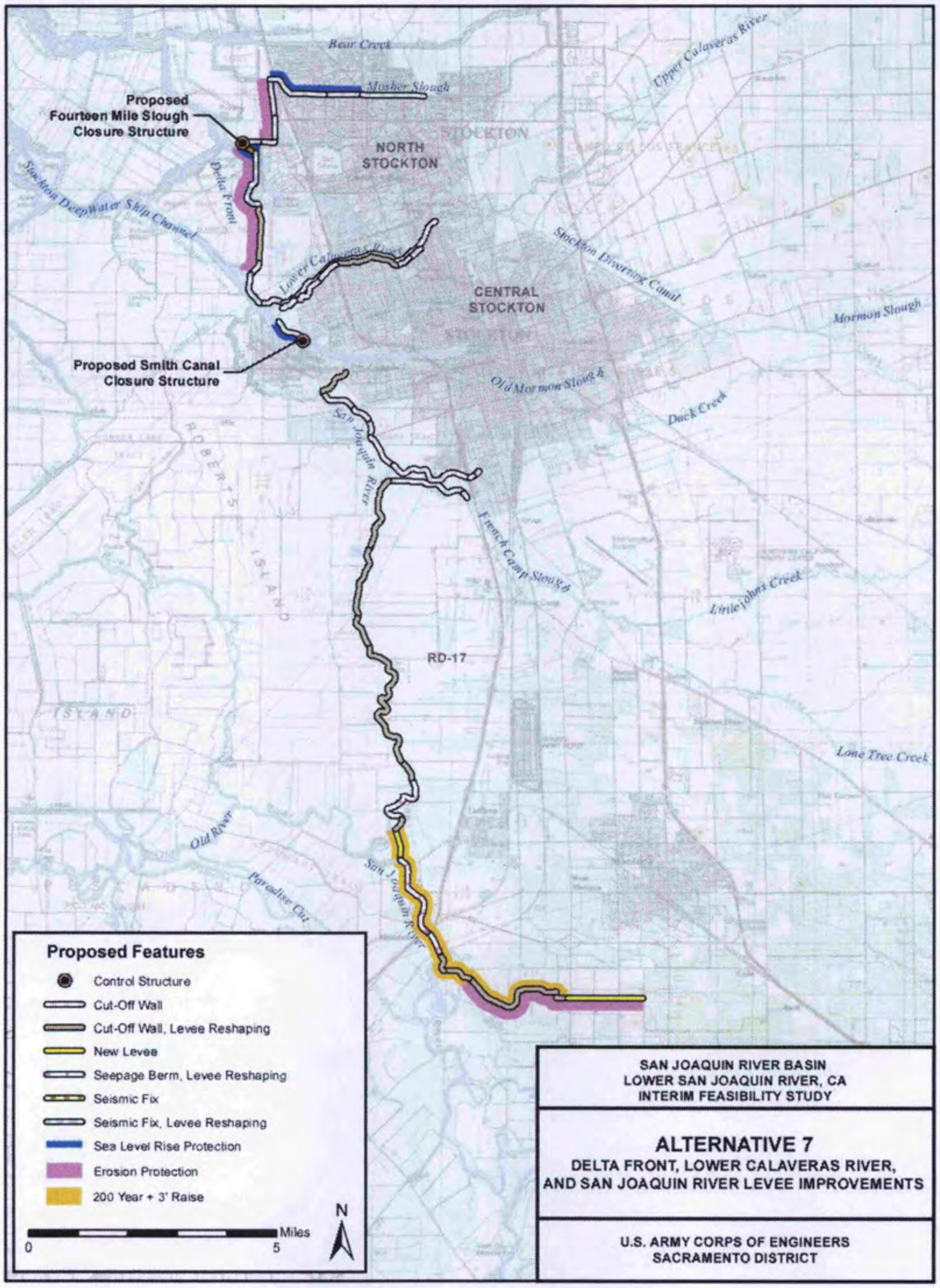


Figure 3-8. Alternative 7.

Ex. "2":

US Army Corps of Engineers, Sacramento District "*San Joaquin River Basin Lower San Joaquin River, CA DRAFT Integrated Interim Feasibility Report/Environmental Impact Statement/Environmental Impact Report*" dated February 2015; Page 3-57

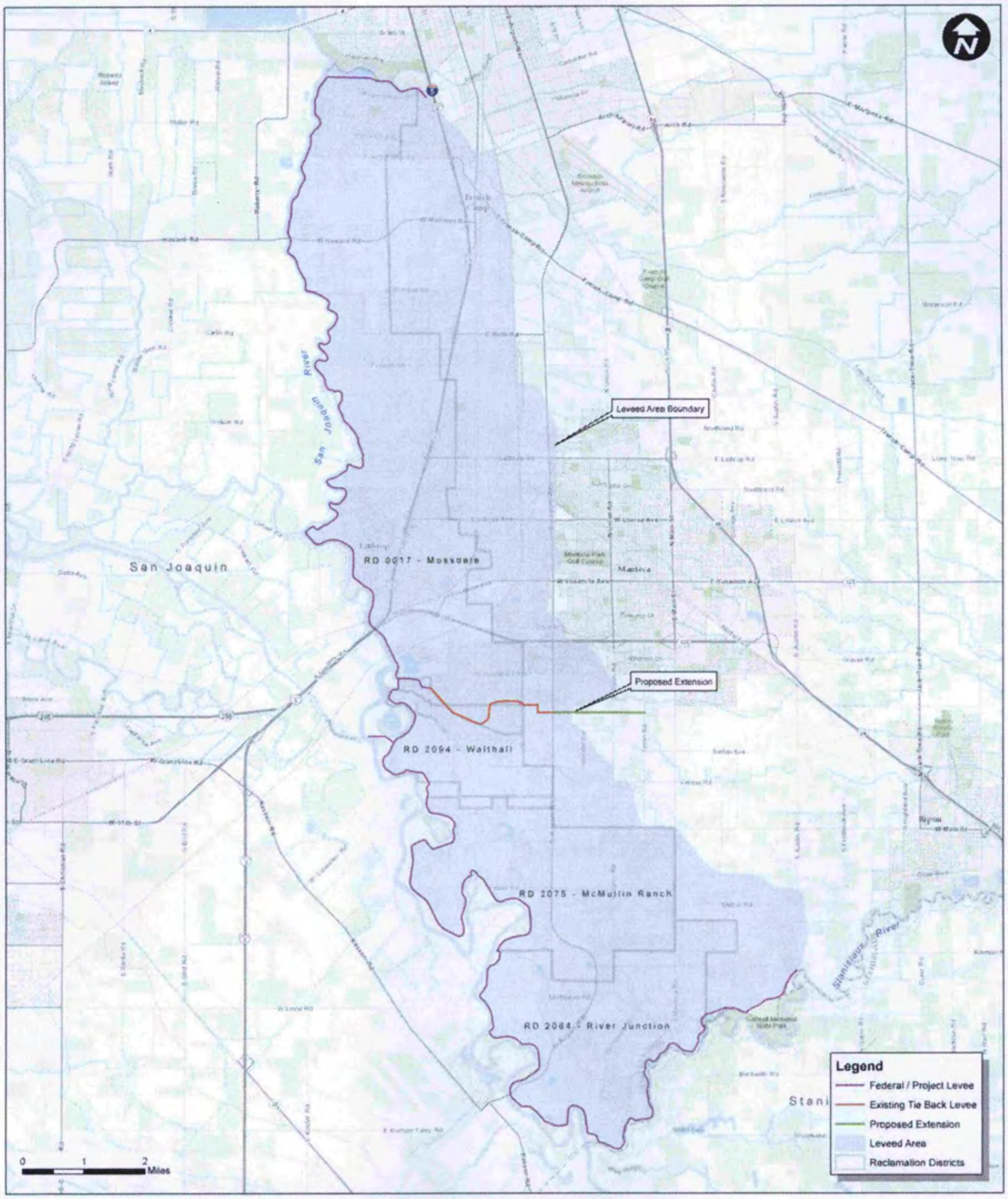
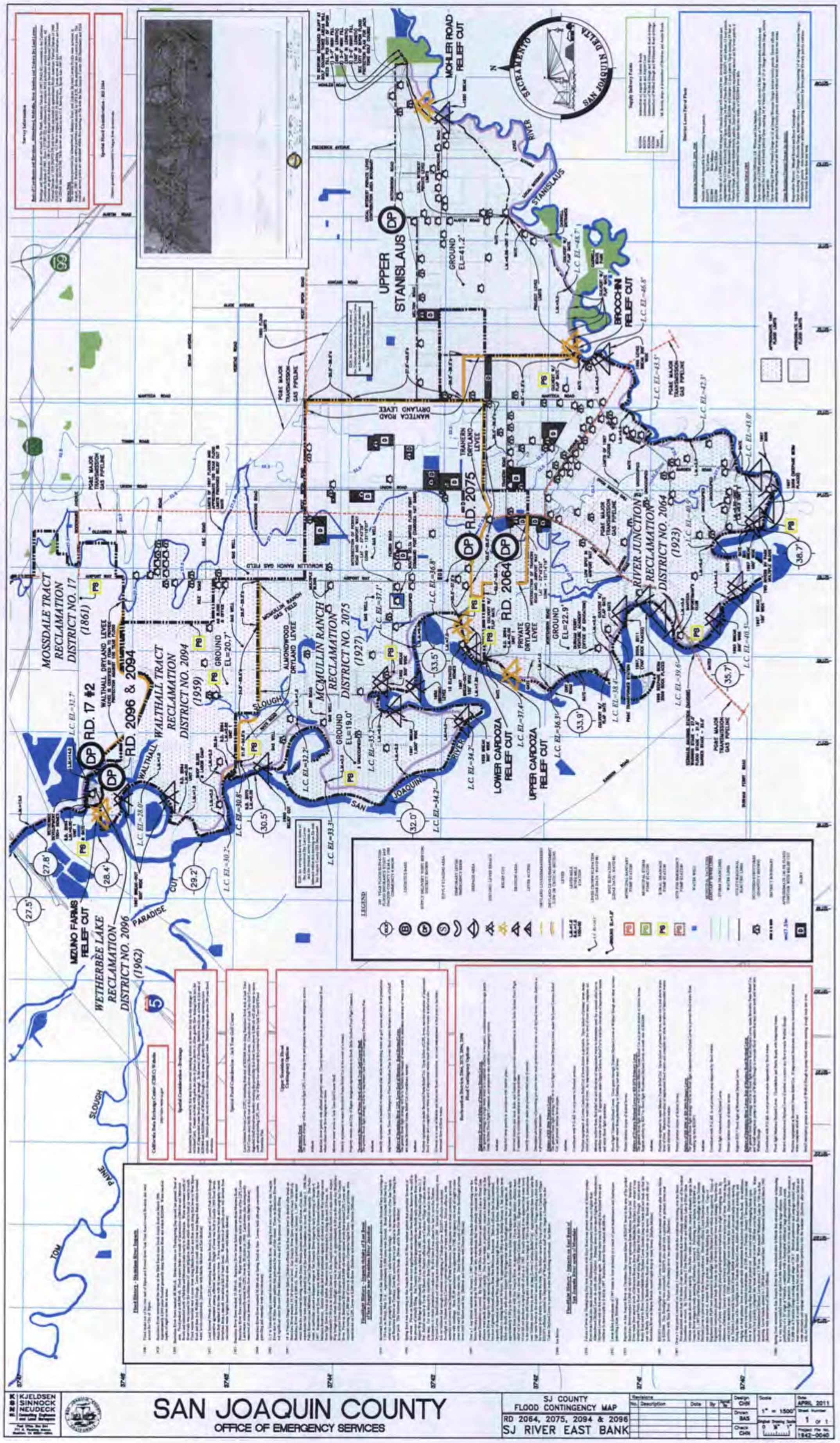


Figure 3-19. San Joaquin River East Levee System.

Ex. "3":

San Joaquin County Office of Emergency Services "*SJ County Flood Contingency Map, RD 2064, 2075, 2094 & 2096, SJ River East Bank*" dated April 2011


SAN JOAQUIN COUNTY
OFFICE OF EMERGENCY SERVICES
SJ COUNTY
FLOOD CONTINGENCY MAP
RD 2064, 2075, 2094 & 2096
SJ RIVER EAST BANK
KJELDSEN
SINNOCK
NEUDECK
APRIL 2011
1" = 1500'
MOSSDALE TRACT RECLAMATION DISTRICT NO. 17 (1861)
RD. 17 #2
RD. 2096 & 2094
WALTHALL TRACT RECLAMATION DISTRICT NO. 2094 (1959)
MCMULLIN RANCH RECLAMATION DISTRICT NO. 2075 (1927)
RIVER JUNCTION RECLAMATION DISTRICT NO. 2064 (1923)
WETHERBEE LAKE RECLAMATION DISTRICT NO. 2096 (1962)
MIZUNO FARMS RELIEF CUT
LOWER CARDOZA RELIEF CUT
UPPER CARDOZA RELIEF CUT
BROCCHINI RELIEF CUT
MOHLER ROAD RELIEF CUT
UPPER STANISLAUS
RD. 2075
RD. 2064
SAN JOAQUIN RIVER
STANISLAUS RIVER
PARADISE CUT
SACRAMENTO
SAN JOAQUIN
DELTA
LEGEND

Ex. "4":

Reclamation District No. 17 (Prepared by AECOM) "*Final Environmental Impact Report Phase 3-RD 17 Levee Seepage Repair Project*" dated March 2015 (SCH #2010042073); Page ES-8

Table ES-12~~-1~~
Phase 3 Repair Project ~~EIS/~~EIR Action Alternatives

Levee: Reach	Levee: Element	Minimum Footprint Alternative (Alternative 1)	Maximum Footprint Alternative (Alternative 2)	Preferred Alternative
I	Ia	seepage berm	seepage berm	seepage berm
	Ib	seepage berm with chimney drain	seepage berm with chimney drain	seepage berm with chimney drain
	Ie	seepage berm with chimney drain	seepage berm with chimney drain	seepage berm with chimney drain
II	**IIa**	**cutoff wall**[1]	**setback levee**	cutoff wall
	IIb	**cutoff wall**	**setback levee**	cutoff wall
III	IIIa	chimney drain in existing seepage berm	chimney drain in existing seepage berm	chimney drain in existing seepage berm
	IIIb	seepage berm with chimney drain	seepage berm with chimney drain	seepage berm with chimney drain
IV	IVa	seepage berm with chimney drain	seepage berm with chimney drain	seepage berm with chimney drain
	IVc	**cutoff wall**	**seepage berm with chimney drain/toe drain** or **setback levee**	*setback levee with seepage berm and cutoff wall*
V	**Va**	**cutoff wall**	**seepage berm with toe drain**	cutoff wall
VI	**VIa.1**	**cutoff wall**	**seepage berm with toe drain**	cutoff wall
	VIa.3	N/A	N/A	*cutoff wall*
	VIa.4	seepage berm with toe drain	seepage berm with toe drain	seepage berm with *chimney drain*/toe drain *and cutoff wall*
	VIb	chimney drain in existing seepage berm	chimney drain in existing seepage berm	*cutoff wall*
	VIc	**seepage berm and fill**	**setback levee**	*cutoff wall*
	VId	**seepage berm and fill**	**setback levee**	*chimney drain* and fill
	VIe	**seepage berm and fill**	**setback levee**	*chimney drain* and fill
VII	VIIb	seepage berm with chimney drain	seepage berm with chimney drain	seepage berm with chimney drain
	VIIe	slurry cutoff wall or sheet pile cutoff wall[1]	slurry cutoff wall or sheet pile cutoff wall[1]	cutoff wall
	VIIg	seepage berm with toe drain and fill	seepage berm with toe drain and fill	seepage berm with *chimney drain*/toe drain
VIII	VIIIa	seepage berm	seepage berm	*N/A*
IX	IXa	seepage berm	seepage berm	*N/A*
X	Xa	seepage berm	seepage berm	*N/A*
XI	XIa	seepage berm	seepage berm	*N/A*

Notes: **Bolded text** indicates that the proposed method for reducing flood risk for the element is different in each of the alternatives. *Italicized text* indicates that the proposed method for reducing floodrisk for a Preferred Alternative element is different from both Alternative 1 and Alternative 2.

[1] Shallow slurry cutoff wall to be constructed with open-~~cut~~-trench method. Sheet piles to be installed using pile-driving technology.

Source: Data created by AECOM in 2011 based on information provided by Kjeldsen Sinnock Neudeck, Inc.

Ex. "5":

US Army Corps of Engineers, Sacramento District "*San Joaquin River Basin Lower San Joaquin River, CA DRAFT Integrated Interim Feasibility Report/Environmental Impact Statement/Environmental Impact Report*" dated February 2015; Pages 3-4, 4-3, 4-4, 4-5, 4-6, 4-7, 4-8, 5-54 and 5-55

Manage Land Use within Flood-prone Areas

This measure is an activity that the non-Federal sponsors would implement to meet the study objective of reducing flood risk to public health, safety and life. California SB 5 described in Section 2.2.2 is such a measure.

3.1.2 Structural Measures

Levee Raises

Raising levee height to increase the level of performance of existing levees is the focus of this measure. Increase in levee height may require additional levee footprint area to meet design requirements for minimum levee slope and top width. Levee raises would be accomplished by adding material to achieve the desired height. Height increases would be accomplished while maintaining design top width and side slopes, and may require additional landside easement(s) to allow for the increase in levee footprint and necessary access easements.

Cut-off Walls

This measure would be implemented to address through- and under-seepage issues that affect levee performance and safety. Installation of the cut-off wall is accomplished by degrading the levee to one-half height and creating the wall with a soil-bentonite mix. Once the mix has cured, the levee is restored to design height and side slopes to meet current design standards. The depth of the cut-off walls will typically be from 20 to 80 feet, depending on subsurface conditions, which will be determined more precisely during the PED phase through additional borings and corresponding depth required to stop through and under-seepage.

Deep Soil Mixing (Seismic)

This measure would be implemented to provide seismic stability to the Delta Front levees where required. The measure addresses seismic risk in the Delta Front levees due to the makeup of the foundational geomorphology. The Delta area soils are typically unconsolidated alluvial deposits. The deep soil mixing (seismic) measure would involve installation of a grid of drilled soil-cement mixed columns aligned longitudinally with, and transverse to the levee extending beyond the levee prism. This measure acts to minimize lateral deformation of the levee during seismic events.

Setback Levees

Where in-place improvements of levees may not be effective, and adequate footprint area exists, this measure could be implemented to improve the hydraulic capacity and overall effectiveness of the levee system. This measure would allow for ecosystem restoration measures on the water side of the new levee. Setback levees would be built to a height equal to that of the existing levee system. Typical design for a

4.3.1 Cutoff Walls

Seepage cutoff walls are vertical walls of low hydraulic conductivity material constructed through the embankment and foundation to cut off potential through- and under-seepage. In order to be effective in reducing under-seepage, cutoff walls usually tie into an impervious sub-layer. Prior to construction, the construction site and staging areas would be cleared and grubbed. The levee is typically degraded by one half the levee height to provide a sufficient working surface and prevent hydraulic fracture of the levee. The cutoff walls for the project area would be a minimum of 3-feet in width; the cutoff wall would be constructed from a working surface elevation to a design depth at least 3-feet into an impermeable layer. During construction, bentonite-water slurry is used to keep the trench open and stable prior to backfilling with the permanent wall material. Soil is mixed with bentonite (SB) and then pushed into the trench, displacing the bentonite-water slurry. After a predetermined settlement period, an impervious cap is constructed above the cutoff wall and the levee is reconstructed using suitable material (Type 1 levee fill) to the correct design elevation and current USACE levee design criteria.

The conventional slurry method for SB walls is an open trench method that uses an excavator with a long-stick boom to excavate the slurry trench. The conventional method has a maximum depth of about 70 to 80 feet. Cutoff walls in North and Central Stockton would extend up to 70 feet below the working surface elevation. Some areas in RD 17 would require cutoff walls using Deep Mixing Method and would need to be up to 120 feet below the working surface elevation. The Deep Mixing Method involves blending the existing soil with cementitious material using blade or auger based mixing tools. Figure 4-1 shows a typical plan for a cutoff wall.

4.3.2 Levee Reshaping (also called "Geometric Fix")

This measure would include reshaping the existing levees to restore them to USACE levee design criteria for side slopes and crown width. For the LSJRFS area, the minimum crest width for mainline or major tributary levees is 20 feet; the minimum crest width for minor tributary levees is 12 feet. Existing levees with landside and waterside slopes as steep as 2H:1V (i.e., for every 2 feet of horizontal distance, there is a 1 foot increase in height) may be acceptable if slope performance has been good and if the slope stability analyses determined the factors of safety to be adequate. Newly constructed levees should have 3H:1V waterside and landside slopes.

For new levees constructed in the LSJRFS area, a minimum permanent landside toe clear access easement of 20 feet is required; for existing levees within the LSJRFS area, a minimum permanent landside toe clear access easement of 10 feet is required. For both new and existing levees in the LSJRFS a minimum permanent waterside toe vegetation free zone (VFZ) of 15 feet is required unless a variance is approved by USACE.

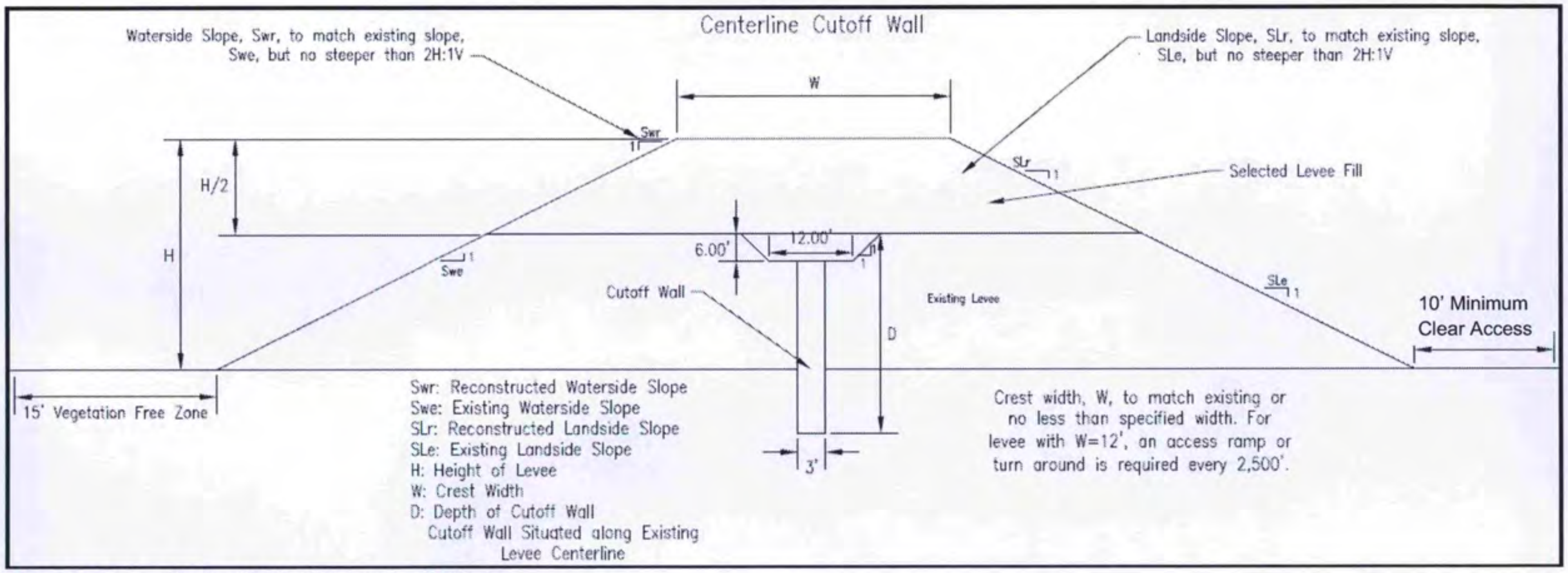


Figure 4-1. Cut-off Wall Typical Plan.

Note that the landside easement (right side) shown would be the minimum easement; landside easements would range from 10 feet to 20 feet from the levee toe.

Prior to construction, the waterside levee crest edge would be cleared and grubbed and the crown and existing landside slope would be stripped to remove at least 2 feet of material. To correct levee geometry, suitable material would be placed along the landside of existing levee slopes where needed to provide the minimum slope, required height, and crest width to meet current USACE levee design criteria, as detailed above. After construction, slopes would be hydroseeded for erosion control.

The additional area added to the landside toe by widening varies from 1 to 30 feet, depending on the existing width of the levee. The slope reshaping typical plan is shown on Figure 4-2. Slope reshaping and levee height fixes may require relocation of landside toe drains and ditches. These toe drains and ditches would be reestablished landward of the improved levee toe and would continue to function as they did before the levee improvements were constructed.

4.3.3 Levee Raise (Levee Height Fix)

This measure describes the construction action that would be taken to repair the levee height in locations where the crown has slumped and to raise the existing levee height to reasonably maximize net benefits. Where SLR was a design consideration, the height could increase up to 5 feet. An increase in levee height may require additional levee footprint area to meet design requirements for minimum levee slope and crown width. Prior to construction, the waterside levee crest edge would be cleared and grubbed and the crown and existing landside slope would be stripped to remove at least 2 feet of material. To construct a levee raise, suitable material would be placed along the crown and landside of existing levee slopes, where needed, to provide the minimum slopes, required height, and crest width that meet current USACE levee design criteria. The typical plan for a levee raise is shown in Figure 4-2.

4.3.4 Seepage Berm

Seepage berms are proposed to address levee stability, under- and through-seepage which are affecting levee performance and safety. A seepage berm is typically built adjacent to the landside of the levee and consists of layers of sand, gravel, and soil. The purpose of the berm is to control seepage flows and reduce the risk of the levee being undermined during a high-water event. The seepage berm acts as a cap, controlling the seepage flow below the berm surface and allowing the flow to reach an exit location in such a way that the undermining of levee soils is reduced or eliminated, thereby preventing boils and piping.

The seepage berm width could range from 100 to 200 feet from the landside toe of the existing levee with a maximum width of 300 feet. The seepage berms would be approximately 5 feet thick at the toe of the existing levee and would gradually slope downward to about 3 feet thick at the landside edge, with a 3:1 slope to ground level.

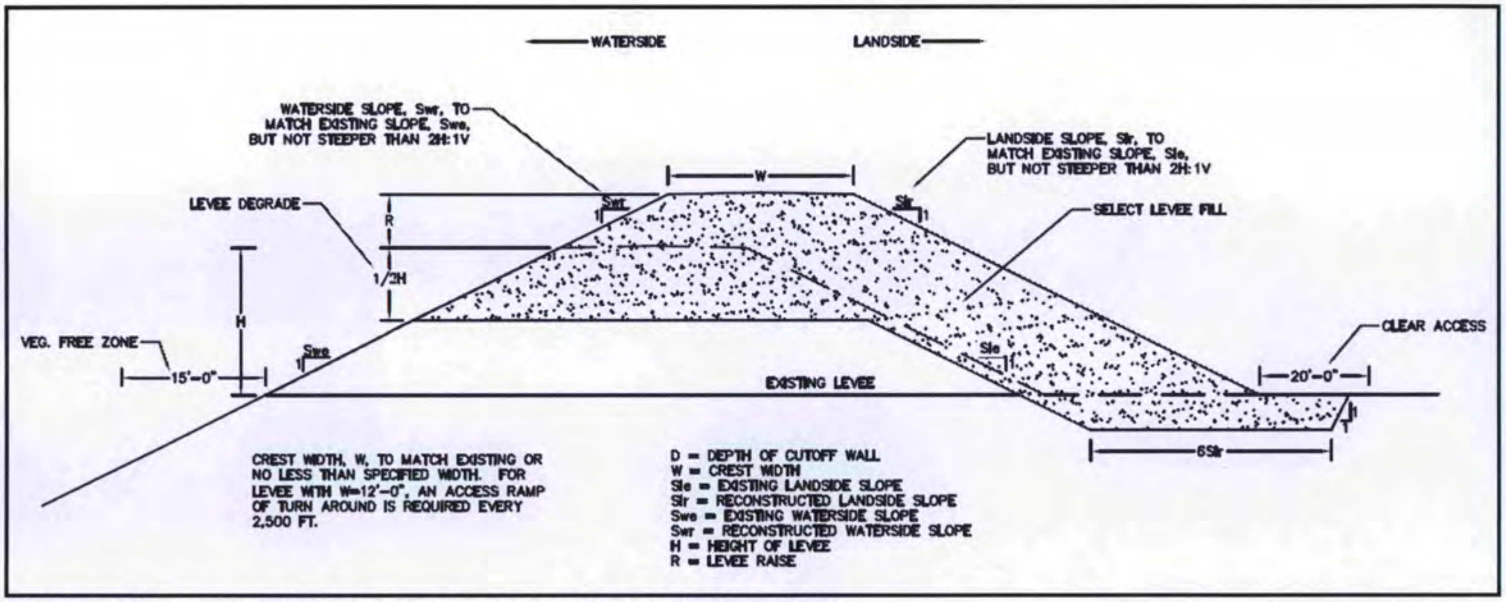


Figure 4-2. Levee Reshaping and Levee Raise Typical Plan.

Note that the landside easement (right side) shown would be the maximum clear access easement; landside easements would range from 10 feet to 20 feet from the levee toe. Half levee degradation is generally not proposed unless a cutoff wall would be installed. Instead, an internal drain may be constructed between the existing levee materials and the new fill.

Prior to construction the landside construction area would be cleared and grubbed for the new berm, right of way, and temporary easement. A layer of sand would then be placed on the natural ground surface to help eliminate the movement of fine-grained materials from underneath the levee. Gravel would then be placed on top of the sand to create a drainage layer. The drainage layer would allow the water to flow in a controlled manner and exit the face of the seepage berm to reduce the water pressure on the landside of the levee. A soil layer would then be placed on top of the gravel to further reduce the risk that seepage flows would pipe or create boils. Filter fabric would be placed between the soil and gravel layer to avoid migration of the soil into the gravel, which could clog the gravel and reduce its ability to carry seepage flows. A typical plan for a seepage berm is shown on Figure 4-3.

4.3.5 New Levee

This measure would involve constructing new levees to reduce the flood risk to some areas or to prevent waters from outflanking (i.e., flowing around the ends of the levees and entering the area intended to be protected) the existing levee system during high water events. To construct the new levees, the construction footprint area would be cleared and grubbed and a new levee foundation would be excavated. A levee inspection trench would be excavated across the entire proposed centerline of the new levee. The depth of the inspection trench would vary depending upon levee height, as required by USACE guidance and the State's Urban Levee Design Criteria (ULDC). For the purposes of the impact analysis, a depth of 3 to 6 feet is assumed.

Construction of the new levee section would proceed in accordance with USACE levee design criteria, with suitable material placed in 6- to 8-inch lifts, moistened, and compacted to design specification until the design elevation has been reached. If needed, a cut-off wall would be constructed prior to the levee construction. Once the wall was complete, the levee prism would then be constructed of impermeable fill (Type 1 levee fill material). For new levees that require erosion protection, quarry stone riprap would next be applied to armor the newly completed levee's waterside slope and provide protection against erosion. Fill material for levee construction would be obtained from local construction borrow areas and commercial sources, and would be delivered to the levee construction sites using haul trucks. A gravel road would be constructed on the crown of the new levees. Following construction, the levee slopes would be reseeded with natural grasses to prevent erosion. A typical plan for a new levee with a cutoff wall is shown on Figure 4-4.

4.3.6 Erosion Protection

This measure would consist of protection of the landside levee slopes should landward areas flood and subject the levee to wind and wave run-up of flood waters. For the purpose of this study, riprap was used to describe erosion protection features and the associated impacts. In PED, other erosion protection methodologies besides riprap may be explored.

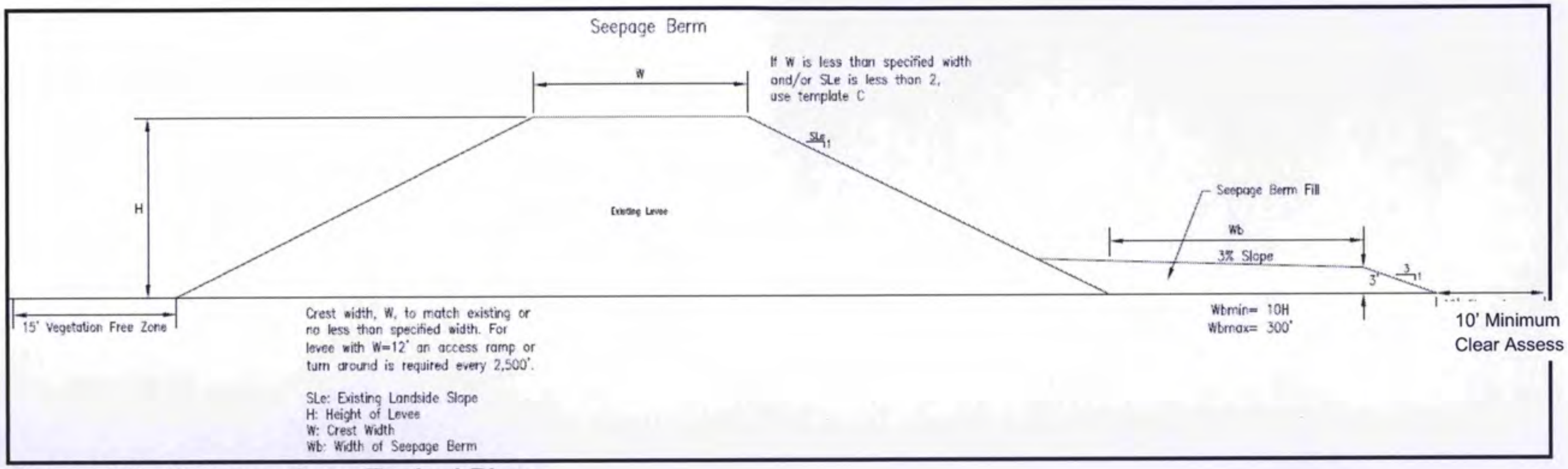


Figure 4-3. Seepage Berm Typical Plan.

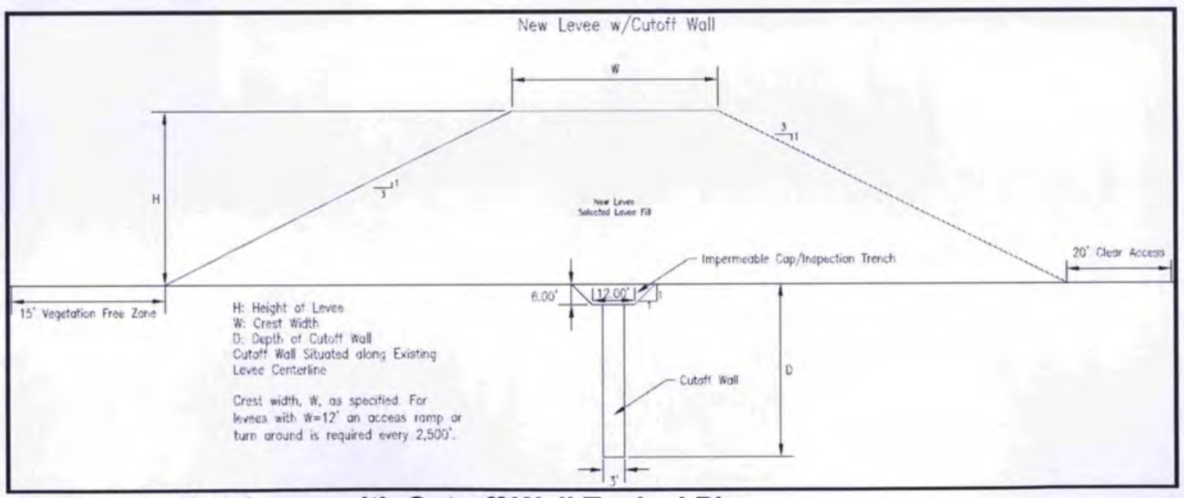


Figure 4-4. New Levee with Cut-off Wall Typical Plan.

preexisting nearby wells would drop to a level that would not support existing land uses or planned uses for which permits have been granted), or

- substantially affect the quality of the groundwater supply.

5.6.3 Alternative 1 - No Action

Development within Stockton and surrounding areas could reduce recharge rates as the area of impervious surfaces increases and a larger volume of surface flows are collected by surface drains. If current groundwater management practices continue, levels will continue to decline, storage will continue to be reduced, and portions of the aquifer could become unusable due to the advancing inflow of higher salinity water from the west. In addition, potential groundwater contamination resulting from a flood event could limit the availability of groundwater.

The maximum sustainable yield from the aquifer is 0.75 to 1 acre-foot per acre per year. For the Delta Water Supply Project (DWSP), the City of Stockton selected a target extraction rate of 0.6 acre-feet per acre per year to reverse the historic overdraft and saline intrusion (City of Stockton 2007a, 2008a). The DWSP includes a storage and recovery program to address the City's long-term groundwater needs. In addition, the Eastern San Joaquin Groundwater Basin Management Plan also includes groundwater banking and recharge projects, although specific implementation measures have not been outlined. Although current groundwater supply is not sufficient for the anticipated growth, groundwater impacts would be reduced to **less-than-significant** through implementation of target extraction rates, banking projects, and recharge projects. Further, compliance with local, Federal, and state requirements would be implemented to reduce potential degradation of groundwater quality. Therefore, the No Action Alternative would have a **less-than-significant** impact on groundwater availability.

5.6.4 Alternative 7a

Under Alternative 7a, cutoff walls would be installed along about 20 miles of levees around North and Central Stockton. This alternative would reduce the risk of flooding to areas behind the levee. The areas receiving increased protection from improved levees are urban and are mostly built out. Therefore, the current pattern of groundwater recharge and extraction would be expected to continue.

Use of cutoff walls introduces the potential for groundwater contamination during construction. Primary construction-related contaminants that could reach groundwater include sediment, oil and grease, and hazardous materials. The slurry wall material is relatively benign and would not remain in a liquid state long enough to allow for significant lateral movement within the aquifer. Nevertheless, the release of contaminants into the groundwater would be a **significant** impact.

In addition, cutoff walls could restrict the movement of groundwater towards and away from adjacent rivers, streams and canals. This could change localized near-surface groundwater levels in areas immediately adjacent to the cutoff wall. Shallow wells adjacent to the cutoff wall could be affected by the changes in radial flow, either increasing yields or increasing pumping costs. If yields decrease, a corresponding decrease in water quality could occur as the aquifer lowers and pumps take in more sediment. Cutoff walls may provide a potential benefit to the extent that they disrupt the eastward movement of saline waters.

Although some shallow wells near the slurry wall could be affected, recharge and overall flow to supply wells would not be appreciably affected. The proposed cutoff walls would reach depths of up to 70 feet. Since the upper water-bearing zone, the Victor Formation, extends from the ground surface to a maximum depth of approximately 150 feet and is hydraulically connected to the underlying Laguna Formation, the cutoff wall would not isolate any portion of the shallow water-bearing zone. The cutoff wall should not affect the utility of existing or future water supply wells.

The potential effects of cutoff walls on groundwater and subsurface water flows have become the subject of study only in recent years. In the Central Valley, two detailed technical studies of potential effects of cutoff walls on groundwater were completed in the Sacramento Basin. These studies were for the Natomas Levee Improvement Project and the Feather River West Levee Project/Sutter Basin Pilot Feasibility Study (SAFCA 2007, USACE and SBFCA 2013). Both of these studies found that the groundwater elevation would change by 3 feet or less. No similar studies have been conducted in the San Joaquin Basin. In the absence of any other data, this impact analysis assumes that the potential impact of cutoff walls on groundwater in the project area would be similar to what was identified for the two studies in the Sacramento River Basin and changes to groundwater elevations would be a fraction existing groundwater elevations of 10 to 50 feet or more below ground surface in the project area (San Joaquin County 2007). Further, the implementation of the project would not change land use such that the rate of groundwater recharge would decrease or effect well yields. Therefore, Alternative 7a would have a **less-than-significant** impact on groundwater supplies.

5.6.5 Alternative 7b

Alternative 7b proposes the same repairs as Alternative 7a for North and Central Stockton, but would also include a new levee section on Duck Creek, levee improvements on the northern, western, and southern levees in RD 17, and a section of new levee in the southern part of RD 17. Cutoff walls would be constructed on about 34 miles of levee around North and Central Stockton and RD 17. Potential impacts are the same as those described for Alternative 7a. Like north and central Stockton, the future growth anticipated by the proposed General Plan for RD 17 would not substantially deplete groundwater supplies if the proposed target extraction rate of 0.6 acre-feet per acre per year is met (City of Stockton 2007a, 2008a).

Ex. "6":

US Army Corps of Engineers, Sacramento District "*San Joaquin River Basin Lower San Joaquin River, CA DRAFT Integrated Interim Feasibility Report/Environmental Impact Statement/Environmental Impact Report*" dated February 2015; Pages 7-6 and 7-7

Socioeconomics and Environmental Justice Compliance are also discussed in Chapter 5, Section 5.13. Once all public comments have been received and addressed, as appropriate, the project will be in full compliance with EO 12898.

7.1.8 Executive Order 13112: Invasive Species

Executive Order 13112, signed February 3, 1999, directs all Federal agencies to prevent and control the introduction of invasive species in a cost-effective and environmentally sound manner. The order established the National Invasive Species Council, which is composed of Federal agencies and departments, and the supporting Invasive Species Advisory Committee, which is composed of state, local, and private entities. The council's national invasive species management plan recommends objectives and measures to implement Executive Order 13112 and to prevent the introduction and spread of invasive species (National Invasive Species Council 2008). Executive Order 13112 requires consideration of invasive species in NEPA analyses, including their identification and distribution, their potential effects, and measures to prevent or eradicate them.

7.1.9 Farmland Protection Policy Act (7 U.S.C. 4201, et seq.)

The Farmland Protection Policy Act was authorized to minimize the unnecessary and irreversible conversion of farmland to nonagricultural use due to Federal projects. This Act protects Prime and Unique farmland, and land of statewide or local importance. The Farmland Protection Policy Act protects forestland, pastureland, cropland, or other land that is not water or urban developed land. The Farmland Protection Policy Act requires a Federal agency to consider the effects of its action and programs on the Nation's farmlands. This Act is administered by the NRCS. The NRCS is authorized to review Federal projects and if farmland is being affected determine a farmland conversion impact rating for the farmland affected by the Federal project. USACE is required to provide the NRCS with project maps and descriptions to assist in determining impacts to Prime and Unique farmlands.

In California, NRCS uses a land evaluation and site assessment system (LESA) to establish a farmland conversion impact rating score on proposed sites of Federally-funded and assisted projects. This score is used as an indicator for the project sponsor to consider alternative sites if the potential adverse impacts on the farmland exceed the recommended allowable level. Farmlands are scored on a scale of 260 points, and under the FPPA, farmlands receiving a total score of less than 160 points need not be given further consideration for protection and no alternative sites need to be evaluated (FPPA Rule 401.24, Section 658.4). Coordination with NRCS is on-going. The LESA evaluation will be completed and included in the final report. Preliminary review indicates that the permanent impacts on Prime Farmlands resulting from construction of the TSP would be considered less than significant since construction would primarily occur within the footprint of existing flood risk management infrastructure. New areas affected would mainly be within lands already converted to urban uses. Once the

Farmland Impact Rating is received from NRCS the project will be in full compliance with this Act.

7.1.10 Fish and Wildlife Coordination Act of 1958, as amended (16 U.S.C. 661, et seq.)

The Fish and Wildlife Coordination Act (FWCA) of 1958 requires that all Federal agencies consult with USFWS, NMFS, and the affected state wildlife agency for activities that affect, control, or modify surface waters, including wetlands and other waters. Under the FWCA, USFWS and NMFS and the applicable state fish and wildlife agency (CDFW) have an extended responsibility for project review that encompasses concerns about plant and wildlife species that may not be addressed under NEPA and the Federal ESA. This extended responsibility may include a project's secondary effects on jurisdictional waters, including wetlands. USFWS and NMFS review CWA Section 404 permit applications, as well as other Federal actions perceived to modify waters, and prepare a coordination act report to document the coordination between the Federal agency and the appropriate state regulatory agencies (Cylinder et al. 2004). The USFWS and CDFW have participated in evaluating the proposed project, and a draft CAR is provided in Appendix A-2. USACE will be in full compliance with this act once USFWS has issued the final CAR and USACE given full consideration to the USFWS' recommendations and included the final CAR with the study report to Congress for project authorization.

7.1.11 Magnuson-Stevens Fishery Conservation and Management Act (16. U.S.C. 1801, et seq.)

The Magnuson-Stevens Fishery Conservation and Management Act (Magnuson-Stevens Act) establishes a management system for national marine and estuarine fishery resources. Essential Fish Habitat (EFH) is defined as "waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity." The legislation states that migratory routes to and from anadromous fish spawning grounds should also be considered EFH. The phrase "adversely affect" refers to the creation of any effects that reduce the quality or quantity of EFH. Federal activities that occur outside an EFH but that may, nonetheless, have an effect on EFH waters and substrate must also be considered in the consultation process. Under the Magnuson-Stevens Act, effects on habitat managed under the Pacific Salmon Fishery Management Plan must also be considered.

This law requires all Federal agencies to consult with NMFS regarding all actions or proposed actions permitted, funded, or undertaken that may adversely affect EFH. In consulting, the action agency must provide NMFS with a written assessment of the effects of their action on EFH. If NMFS determines that a proposed Federal or State activity would adversely affect EFH, then NMFS is obligated to provide EFH conservation recommendations to the action agency. The Federal action agency that receives the conservation recommendations must provide a detailed response in writing to NMFS within 30 days after receiving EFH conservation recommendations. The

Ex. "7":

Reclamation District No. 17 (Prepared by AECOM) "*Final Environmental Impact Report Phase 3-RD 17 Levee Seepage Repair Project*" dated March 2015 (SCH #2010042073); Pages 3.2-4 and 3.2-9

51293[e][1]) because the ~~proposed project~~ Phase 3 Repair Project would consists of work to reduce potential flood damage. The preliminary notice to ~~the California Department of Conservation~~DOC, provided before lands actually ~~are~~ is ~~actually~~ acquired, would demonstrate the Phase 3 Repair Project area purpose ~~of the project~~ and the exemption from the findings.

Farmland in RD 17 that is in an agricultural preserve and ~~that is~~ currently is held in Williamson Act contracts is shown in **Figure 3.2-2**.

3.2.1.3 REGIONAL AND LOCAL

San Joaquin County General Plan

The *San Joaquin County General Plan 2010* (County General Plan) contains objectives and policies that guide land use decisions in the unincorporated parts of the county (San Joaquin County 1992). The Resources Element of the County General Plan includes goals and policies addressing agricultural land uses, including the following policy relating to preserving agricultural lands and compatible uses:

- **Policy 5:** Agricultural areas shall be used principally for crop production, ranching, and grazing. All agricultural support activities and nonfarm uses shall be compatible with agricultural operations and shall satisfy the following criteria:

  (a) The use requires a location in an agricultural area because of unusual site area requirements, operational characteristics, resource orientation, or because it is providing a service to the surrounding agricultural area;

  (b) The operational characteristics of the use will not have a detrimental impact on the management or use of surrounding agricultural properties;

  (c) The use will be sited to minimize any disruption to the surrounding agricultural operations; and

  (d) The use will not significantly impact transportation facilities, increase air pollution, or increase fuel consumption.

City of Lathrop General Plan

The *Comprehensive General Plan for the City of Lathrop, California* divides the city of Lathrop into three subplan areas (City of Lathrop 2004:1-2). The Phase 3 Repair Project ~~A~~area is adjacent to Sub-plan Area #3, located on the east side of the San Joaquin River and west of Interstate 5, and to Sub-plan Area #1 located east of Interstate 5, adjacent to the east levee of the San Joaquin River. Lands located within the subplan areas are planned for development and policies related to agricultural land generally support maintaining agricultural uses on lands outside the subplan areas.

City of Manteca General Plan

The *City of Manteca General Plan 2023 Policy Document* (City of Manteca 2003), Resource Conservation Element, Goal RC-9, promotes the continuation of agricultural uses in the Manteca area and discourages the premature conversion of agricultural land to nonagricultural uses, while providing for the urban development needs of Manteca. Policies relevant to the proposed project include the following:

- **Policy RC-P-19:** The City shall support the continuation of agricultural uses on land designated for urban use, until urban development is imminent.

- **Policy RC-P-20:** The City shall provide an orderly and phased development pattern so that farmland is not subjected to premature development pressure.
- **Policy RC-P-21:** In approving urban development near existing agricultural lands, the City shall take actions so that such development will not unnecessarily constrain agricultural practices or adversely affect the viability of nearby agricultural operations.
- **Policy RC-P-23:** Protect designated agricultural lands, without placing an undue burden on agricultural landowners.
- **Policy RC-P-24:** Provide buffers at the interface of urban development and farmland in order to minimize conflicts between these uses.
- **Policy RC-P-26:** The City shall restrict the fragmentation of agricultural land parcels into small rural residential parcels except in areas designated for estate type development in the General Plan Land Use Diagram.
- **Policy RC-P-27:** The City shall discourage the cancellation of Williamson Act contracts outside the Primary Urban Service Boundary line.

3.2.2 ENVIRONMENTAL SETTING

Within the Phase 3 Repair Project ~~A~~area, agricultural land uses are located on nonurbanized lands along the east levee of the San Joaquin River and on either side of the dryland levee located east of the San Joaquin River and within the ~~c~~City of Manteca. **Table 3.2-1** shows existing land uses and Important Farmland classifications for lands within the project footprint for each element.

Table 3.2-1
Existing Land Uses and Important Farmland Classifications for Phase 3 Repair Project Elements

Element	Jurisdiction	Existing Land Use	Important Farmland Classification
Ia	San Joaquin County	Agriculture	Prime/Statewide Importance
Ib		Agriculture	Prime
Ie		Agriculture/rural residence and River Mill Event Center (commercial) adjacent on downstream side	Prime
IIab		Agriculture/rural residence/human-made lake/ Haven Acres Marina at south end of element	Prime/Rural Residential/Non-agricultural or Natural Vegetation/Semi-agricultural and Rural Commercial Land
IIIa	City of Lathrop	Existing levee and seepage berm	Not applicable
IIIb		Agriculture	Prime
IVa		Agriculture/residential subdivision	Prime/Non-agricultural or Natural Vegetation
IVc		Undeveloped open space on riverside/residential subdivision on landside	Prime/Non-agricultural or Natural Vegetation
Va–Via.1		Agriculture/rural residence/farm complex/ subdivision and City of Lathrop park	Prime/Statewide Importance/Unique/ Non-agricultural or Natural Vegetation
VIa.4		Agriculture	Prime/Local Importance
VIb		Existing levee and seepage berm	Not applicable
VIcde		Union Pacific Railroad; San Joaquin County Park—Mossdale Crossing Regional Park	Urban and Built Up

Ex. “8”:

City of Manteca “*General Plan 2023, Policy Document*”

Adopted October 6, 2003 (Resource Conservation); Pages

8-10 and 8-11

Goal RC-9. To promote the continuation of agricultural uses in the Manteca area and to discourage the premature conversion of agricultural land to nonagricultural uses, while providing for the urban development needs of Manteca.

8.8.1 Policies: Agricultural Resources

RC-P-19. The City shall support the continuation of agricultural uses on lands designated for urban use, until urban development is imminent.

RC-P-20. The City shall provide an orderly and phased development pattern so that farmland is not subjected to premature development pressure.

RC-P-21. In approving urban development near existing agricultural lands, the City shall take actions so that such development will not unnecessarily constrain agricultural practices or adversely affect the viability of nearby agricultural operations.

RC-P-22. Nonagricultural uses in areas designated for agriculture should be redirected to urban areas.

RC-P-23. Protect designated agricultural lands, without placing an undue burden on agricultural landowners.

RC-P-24. Provide buffers at the interface of urban development and farmland; in order to minimize conflicts between these uses.

RC-P-25. The City shall ensure, in approving urban development near existing agricultural lands, that such development will not unnecessarily constrain agricultural practices or adversely affect the economic viability of nearby agricultural operations.

RC-P-26. The City shall restrict the fragmentation of agricultural land parcels into small rural residential parcels except in areas designated for estate type development in the General Plan Land Use Diagram.

RC-P-27. The City shall discourage the cancellation of Williamson Act contracts outside the Primary Urban Service Boundary line.

RC-P-28. The City shall not extend water and sewer lines to premature urban development that would adversely affect agricultural operations.

RC-P-29. The City shall encourage Manteca Unified School District and the Delta Community College District to maintain the school farm facilities and associated education programs in the City.

RC-P-30. The City of Manteca will participate in a county-wide program to mitigate the conversion of Prime Farmland and Farmlands of Statewide Importance to urban uses.

8.8.2 Implementation: Agricultural Resources

RC-I-30. Apply the following conditions of approval where urban development occurs next to farmland.

- Require notifications in urban property deeds that agricultural operations are in the vicinity, in keeping with the City's right-to-farm ordinance.
- Require adequate and secure fencing at the interface of urban and agricultural use.
- Require phasing of new residential subdivisions; so as to include an interim buffer between residential and agricultural use.

RC-I-31. Work with San Joaquin County on the following issues:

- Pesticide application and types of agricultural operations adjacent to urban uses.
- Support the continuation of County agricultural zoning in areas designated for agricultural land use in the Area Plan.

Ex. “9”:

Reclamation District No. 17 (Prepared by AECOM) “*Final Environmental Impact Report Phase 3-RD 17 Levee Seepage Repair Project*” dated March 2015 (SCH #2010042073); Page 3.2-16

~~also~~ result in permanent conversion of Important Farmland for construction of setback levees in Elements IIab, ~~and~~ Ivc, and VIcde~~IVe~~. The Important Farmland on the waterside of the setback levee would be converted to nonagricultural uses, such as habitat or open space. ~~The~~This impact on the permanent conversion of Important Farmland ~~under Alternative 2~~ would be **significant**.

Applicant's Preferred Alternative

Table 3.2-2 shows the acreage of Important Farmland that would be converted to nonagricultural uses under the Applicant's Preferred Alternative. Under this alternative, Important Farmland acreage would be required for construction of seepage berms, a setback levee, and an access road. As described under Alternative 1, construction of seepage berms would be considered a permanent conversion of Important Farmland to nonagricultural uses. This impact on the permanent conversion of Important Farmland would be **significant**.

Mitigation Measure 3.2-a: Minimize Important Farmland Conversion to the Extent Practicable and Feasible.

Alternative 1—Minimum Footprint Alternative, Alternative 2—Maximum Footprint Alternative, and the ~~Alternatives and 1 and 2~~ Applicant's Preferred Alternative

RD 17 shall implement the following measures ~~listed below~~ concerning Prime Farmland, Unique Farmland, and Farmland of Statewide Importance to minimize adverse effe~~impac~~ts on these lands:

a) During ~~project~~ Phase 3 Repair Project construction, utilities disturbance ~~of utilities~~ that ~~are~~ is needed for agricultural purposes (including wells, pipelines, and power lines) and agricultural drainage systems ~~shall~~ will be minimized so that agricultural operations are not substantially disrupted. If any agricultural infrastructure, such as wells, pipelines, and drainage canals, ~~must~~ need to be removed during project construction, ~~restore~~ the function of these facilities will be restored as soon as possible for lands that are to remain in agricultural production.

b) Disturbance of agricultural land and agricultural operations during Phase 3 Repair Project construction ~~shall~~ will be minimized by locating construction staging areas on sites that are fallow, that already are ~~already~~ developed or disturbed, or that are to be discontinued for use as agricultural land, and by using existing roads to the extent possible to access project construction ~~areas~~sites.

To the extent practicable and feasible, when expanding the footprint of a flood ~~damage reduction~~control facility (e.g., levee or berm) onto agricultural land, the most productive topsoil from the project construction footprint ~~shall~~ will be salvaged and redistributed to less -productive agricultural lands near the project construction ~~area~~ site that ~~could~~ can benefit from the introduction of good -quality soil. By agreement between the implementing agencies or landowners of affected properties and the recipient(s) of the topsoil, the recipient(s) ~~shall~~ will be required to use the topsoil for agricultural purposes. RD 17 shall implement all terms and conditions of agreements.

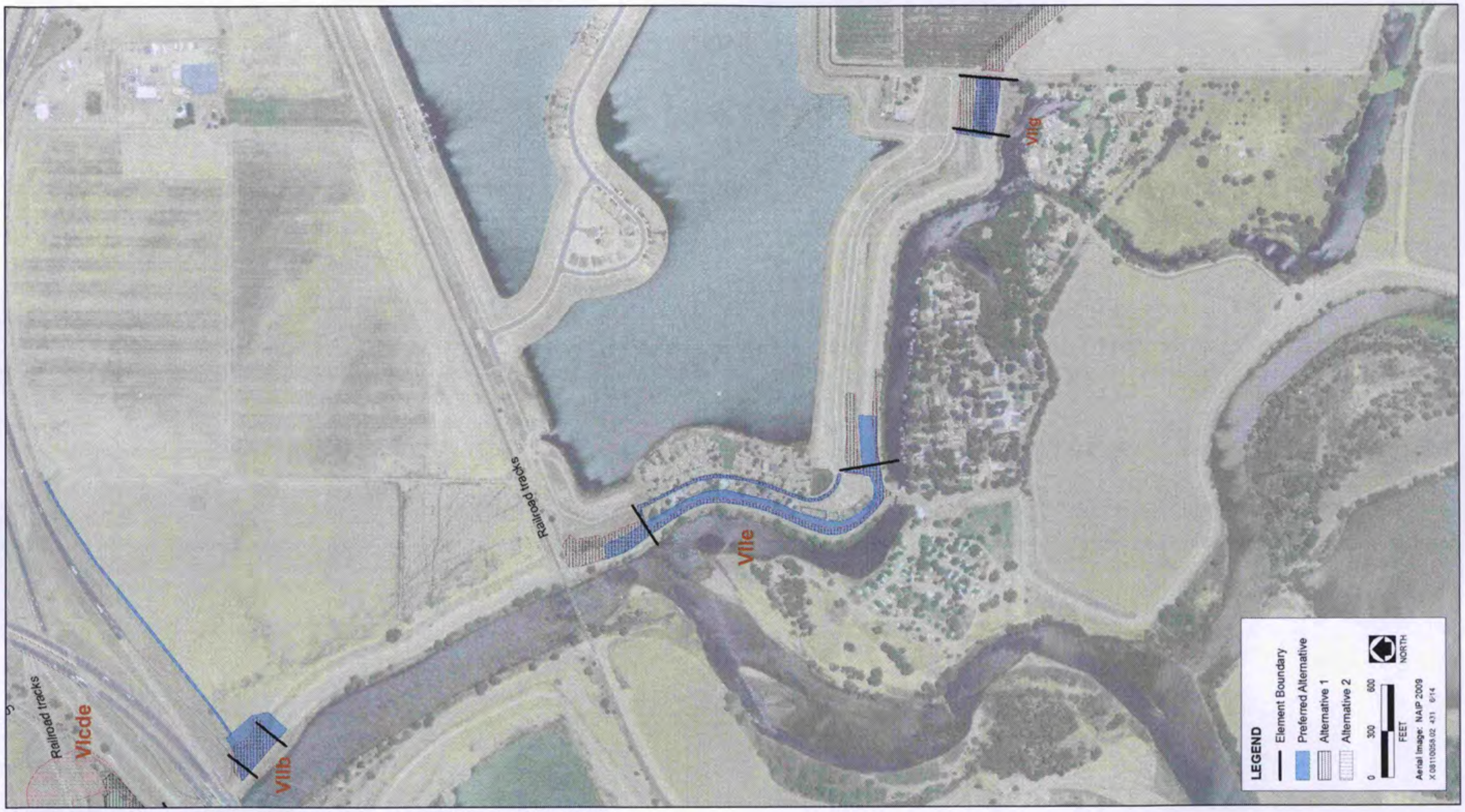
Responsibility: ~~Project proponent~~RD 17.

Timing: Minimize loss of Important Farmland and reuse topsoil before construction and avoid disruption to current agricultural operations during construction. Replace function of agricultural infrastructure as soon as possible after construction in ~~the~~ a particular ~~area~~ location is complete.

~~Implementing~~ Implementation of Mitigation Measure 3.2-a would reduce ~~this~~ the impact on Important Farmland associated with the three a~~A~~lternatives ~~2~~, but not to a less-than-significant level. The impact would remain **significant and unavoidable** for ~~both~~ all alternatives because of the permanent conversion of Important Farmland to nonagricultural uses.

Ex. “10”:

Reclamation District No. 17 (Prepared by AECOM) “*Final Environmental Impact Report Phase 3-RD 17 Levee Seepage Repair Project*” dated March 2015 (SCH #2010042073); Page 2-25



Sources: Data provided by Kjeldsen, Sinnock & Neudeck, ENGEO, and MacKay & Somps in 2010, adapted by AECOM in ~~2010~~2014

Figure 2-9c **Phase 3 Repair Project Levee Elements in Reaches VI–VII**

Ex. "11":

US Army Corps of Engineers, Sacramento District "*San Joaquin River Basin Lower San Joaquin River, CA DRAFT Integrated Interim Feasibility Report/Environmental Impact Statement/Environmental Impact Report*" dated February 2015; Page 5-23

narrows to approximately 500 feet. However, there is one oxbow reach where the floodway is approximately 2,000 feet wide. Flood stages within this reach are dominated by runoff from the San Joaquin River.

Approximately 1 mile downstream of Paradise Cut on the right bank is Wetherbee Lake and the upstream tieback levee of RD 17. The Wetherbee Lake levee segment along the San Joaquin River was a feature of the San Joaquin Flood Control Project which cut off Walthall slough from the San Joaquin River to reduce damages to a resort development along the river. The RD 17 tieback levee is located downstream of Walthall Slough and extends east along the right bank of the slough to high ground. The RD 17 tieback levee is higher than the right bank levee of the San Joaquin River and diverts any floodwaters on the right overbank back into the San Joaquin River. This situation occurred in the flood of January 1997 and is shown on Plate 10. Flood stages within this channel reach are dominated by runoff from the San Joaquin River. Flood stages in the right overbank are dominated by runoff from the San Joaquin River and Stanislaus River.

Old River to French Camp Slough. Old River defines the upstream extent of this reach. Old River is a distributary from the San Joaquin River and conveys floodwaters west into the Sacramento-San Joaquin Delta. There is no hydraulic structure to manage the flow split. The flow split is defined by the hydraulic characteristics of Old River and the San Joaquin River downstream of the flow split.

Within this reach the San Joaquin River further transitions to a less sinuous plan form. The main channel varies in width from 200 to 300 feet. The floodway is contained by left and right bank levees that are approximately 10 to 15 feet tall. From Burns Cutoff to approximately 4 miles downstream, the right bank levee is approximately 3 feet taller than the left bank. The floodway width between the levees varies from 300 feet to 400 feet and widens to 1,400 feet at a few meander bends. The waterside levee face forms the channel bank along most of this reach. Flood stages within this reach are dominated by runoff from the San Joaquin River.

French Camp Slough to Burns Cutoff. French Camp Slough defines the upstream extent of this reach. French Camp Slough is a tributary to the San Joaquin River. The reach characteristics of French Camp slough are described below. The main channel varies in width from 200 to 300 feet. The floodway is contained by left and right bank levees that are approximately 10 to 15 feet tall. The floodway width between the levees varies from 300 feet to 400 feet. The waterside levee face is next to the channel bank along most of this reach. Flood stages within this reach are dominated by runoff from the San Joaquin River. However, influence of ocean tides is evident in flood stage hydrographs.

Burns Cutoff to Deep Water Ship Channel. Burns Cutoff defines the upstream extent of this reach. Burns cutoff is a secondary channel of the San Joaquin River which conveys water on the west side of Rough and Ready Island. Burns cutoff flows

Ex. "12":

US Army Corps of Engineers, Sacramento District "*San Joaquin River Basin Lower San Joaquin River, CA DRAFT Integrated Interim Feasibility Report/Environmental Impact Statement/Environmental Impact Report*" dated February 2015; Pages 4-11 and 4-13 the levee to the proposed toe shown in Figure 4-5. The proposed toe could be located along an imaginary line extending from the landward face of the proposed levee to existing grade. During the current feasibility planning the maximum extent of the reconstruction berm is shown in order to show the maximum impacts which could occur.

Deep soil mixing augers would be used to construct a continuous grouping of cells spaced equally in both the longitudinal and transverse direction to the levee alignment as shown in the plan view in Figure 4-5. The deep soil mixing is a seismic strengthening feature meant to keep the levee from liquefying during seismic activity. After construction is completed, the levee crest would then be topped with a 6-inch aggregate road, and slopes would be hydroseeded for erosion control. This degrading and reconstruction effort would occur along 3 miles of Fourteenmile Slough and Tenmile Slough.

4.3.10 Closure Structures

This measure would include construction of closure structures at the mouths of backwater sloughs at Smith Canal and Fourteenmile Slough to provide flood risk management along those sloughs. The closure structures would control back-flooding from the San Joaquin River and Delta during high water events. The gates would be operated typically between November 1st to April 30th which covers the rainy season and the period when high tides occur in this area. Specifically, the gates will be operated when the high tide is forecast to reach, or exceed +8.00 ft NAVD88 to prevent high flows from entering the canal/slough. The gate would be closed at the lowest tide prior to the forecasted high tide and remain closed until the high tide begins to recede. The gate would then be opened to allow any accumulated interior drainage behind the gate structure to flow out. This would limit the level and duration of water saturation and reduce the risk of levee damage or failure. Due to the tidal influence of the Delta, high water events could last from a few days to a few weeks, depending on river conditions. During development of the alternatives, Smith Canal and Fourteenmile Slough were identified as appropriate locations for closure structures.

The proposed closure structures would consist of a fixed sheet pile wall structure with an opening gate structure sufficiently large to allow for the safe passage of boats and other watercrafts. Fish and other aquatic organisms would also be able to pass through these gates when they are open. The opening portion of the closure structure would be an automated gate that may open upward or outward. The gate would be approximately 50-feet wide, and would be constructed of stainless steel. The gate would be attached to a concrete foundation using stainless steel anchor bolts. A small building would be built on land directly adjacent to the closure structures to store equiopment required to operate the gate. As needed, a sheet pile floodwall would be constructed adjacent to the control structures to tie the structures into the adjacent levee or high ground areas.

Construction would require dredging or draglining, construction of a temporary cofferdam, in-water excavation, and placement of some structural features in the water.

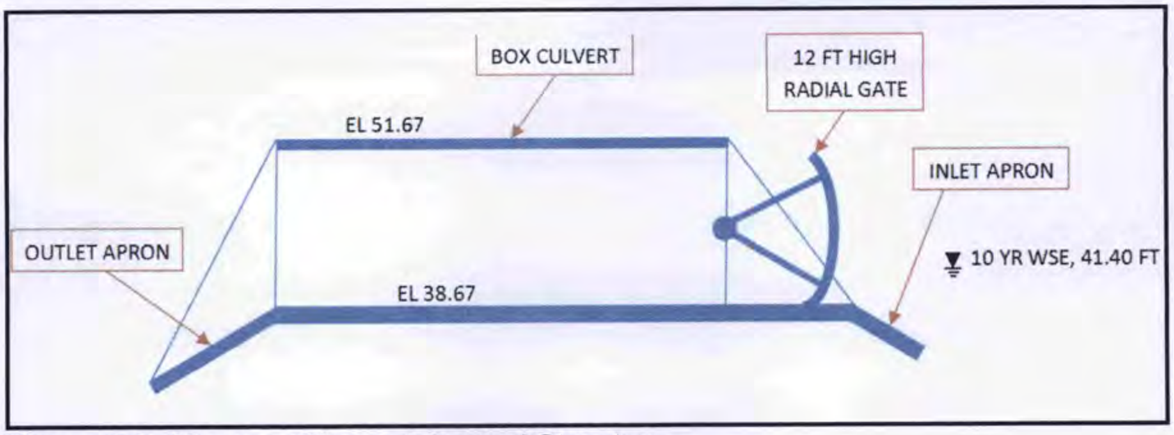


Figure 4-6. Mormon Channel Control Structure.

4.4 ALTERNATIVES

4.4.1 Alternative 1 – No Action

Under no action, the USACE would not participate in flood risk management in the study area as part of the LSJRFS. Although State or local agencies would likely repair area levees in the future to meet Federal (FEMA) or State (SB 5 200-year protection) flood protection obligations, this alternative assumes that flood risk management measures would not be implemented and that the current level of risk of flooding would continue. This risk, as represented by conditions in the study analysis area, would continue to leave both residents and property in and near the cities of Stockton, Lathrop, and Manteca vulnerable to flooding.

In response to major floods in the early 1950s, the USACE constructed several dams, miles of levees, and other features in and near the study analysis area as part of the Lower San Joaquin River and Tributaries project. Since that time, the engineering performance and potential reliability of these project levees have decreased due to identified structural deficiencies, including through- and under-seepage, slope stability, overtopping, and erosion. Under no action, these deficiencies would continue and likely become worse, increasing the risk of future levee failure during high flows.

Climate change also appears to be affecting world-wide temperatures and seasonal climate patterns. Future projections show rises in sea level and changes in inland climate patterns that could result in higher future water-surface elevations in the lower San Joaquin River and tributaries. The no action alternative would not include design features, such as raising levees, to account for potential effects of these higher elevations combined with the identified deficiencies on levee performance. An estimated 264,000 residents and $21 billion in damageable property would continue to be at risk of unexpected levee failure and flooding in the study analysis area.

William F. & M. Judith Kane
[redacted]

April 13, 2015

Tyler Stalker
U.S. Army Corps of Engineers
1325 J Street
Room 1513
Sacramento, CA 95814

Dear Mr. Stalker,

My husband, William Kane and I have lived along Mosher Slough in north Stockton since 1991. Bill is a registered professional geologist and registered professional civil engineer, I am a biologist and horticulturist. We were not able to attend the open meeting in Stockton last week on April 8 but wanted to comment on the proposed changes to Mosher Slough levee.

23-1 We live on the section between Yarmouth Street and Don Avenue, where there are approximately 40 homes, most built around 1975. We purchased our home because of old valley oaks along the slough behind our house so Mosher Slough is our backyard. I walk daily on the slough and am an avid birder having listed almost 100 species along the levee; we have seen salmon in the slough.

23-2 To widen the levee as the Corps intends would completely destroy this valuable habitat, lower our property values, and ultimately, force us to move. Some properties would be removed; these changes would contribute to loss of property taxes for the city.

23-3 Mosher Slough levee was raised in the late 1990s to address the "new" flood zone. Construction at that time preserved the character of the slough and did not require removing vegetation. The slough has never been in danger of overtopping the levee in 25 years of observation.

23-4 "Climate change" and resultant rising sea levels are unproven and controversial propositions that rest on scientific speculation and computer modeling. The amount of destruction required by this project and the financial drag to the economy cannot possibly justify it on the basis of speculative science.

23-5 It is also unlikely that the proposed flood protection will provide any additional mitigation from flooding.
23-6 So we are asking that the Corps please reconsider its options and try to find a less destructive method.
23-7 To protect our investment and quality of life we will actively participate and contribute financially to any
lawsuits that are aimed at stopping this project.

Thank you,

M. Judith Kane

M. Judith Kane

William F. Kane

William F. Kane

From: Judy Kane
To: Stalker, Tyler M SPK
Subject: [EXTERNAL] Mosher Slough Questions
Date: Monday, April 13, 2015 9:46:45 PM

Dear Mr. Stalker,

I am one of the homeowners affected by the plans to raise Mosher Slough levee and have already sent an email with comments but I also have some questions.

24-1 On Figure ES-2 The Tentatively Selected Plan it shows a blue line on the north side of Mosher Slough. Will both sides of the levee be raised or just the north side?

24-2 Since Stockton already has a 200 Year Flood Plan, why spend millions to go to a 500 Year Plan for an almost negligible increase in safety?

24-3 What is the timeline for construction?

24-5 Most of our neighbors did not get a letter from the Corps of Engineers, for something this important (possibility of losing our homes), why were letters not sent to property owners by registered mail?

Thank you,

M. Judith Kane
[redacted]

[redacted]

M. Judith Kane
Vice-President, KANE GeoTech, Inc.

7400 Shoreline Drive, Suite 6
Stockton, California 95219
Tel: 209-472-1822
Mobile: 209-639-1951
Fax: 209-472-0802

1441 Kapiolani Blvd., Suite 1115
Honolulu, Hawaii 96814
Tel: 808-356-2668

From: [redacted]
To: Stalker, Tyler M SPK
Subject: [EXTERNAL] Plan 7a
Date: Monday, April 13, 2015 4:58:34 PM

25-1 It's no wonder Stockton has such a hard time getting people to move there, between the bankruptcy, high crime rate, and low school ratings and now Stockton wants to add this to the list. Here is the new PSA for Stockton..."Move to Stockton, but don't buy a house near the sloughs because soon we are going to destroy them" Doesn't that sound appealing to you?

25-2 I have done my research and houses that back to the sloughs, typically, but not always, have higher home values, because of larger property sizes; which means that people that own them, potentially has a decent paying job, pay income taxes and don't utilize government resources to live on. Now you are going to punish the homeowner by decreasing their property values and or completely taking their property away from them. Sounds like a great idea to me...NOT!!

Neighbor to Mosher Slough

From: [redacted]
To: Stalker, Tyler M SPK
Subject: [EXTERNAL] Plan 7a-Mosher Slough
Date: Monday, April 13, 2015 4:49:25 PM

26-1 I don't understand how a project like this can continue, when such poor public notification has occurred.

26-2 As a new homeowner in the area, it is heartbreaking, to think that part of my property, that I worked so hard on to achieve and pay the mortgage on a month to month basis, and the property taxes, may now be partially taken away. Is this plan going to pay for the relocation of my pool, that this will destroy? Is this plan going to buy me a new shed that will also be destroyed if this plan goes through? When the construction is being done, will I be able to live in my home or will I need to relocate? Is the plan going to pay for my temporary housing? If the plan is approved, "fair market value" is not a fair assessment for purchasing part of my property and the inconvenience it will cause myself and my children and my animals.

26-3 Property values in the area are hurting enough. Do you really think this is going to help? Stockton wants people to be attracted to Stockton: wants them to relocate to Stockton. This is not how a city attracts new hoomeowners/city dwellers.

Homeowner on Hamilton Way

From: Kimberly Watts-Willis
To: Stalker, Tyler M SPK
Subject: [EXTERNAL] FR/EIS/EIR for Lwr. San Joaquin River Feasibility Study, California
Date: Tuesday, April 14, 2015 12:06:06 AM

April 13, 2015

To: Mr Tyler Stalker

USACE, Sacramento District

1325 J Street Sacramento, CA 95814

FROM: Kimberly Watts-Willis

[redacted]

RE: Public Comment and Question/Mosher Slough levee improvements (TSP 7a)

Dear Mr. Stalker:

I have so many questions and comments I am not certain where to begin……so the following are not in logical sequence, nor are they posed in order of importance, necessarily.

27-1 1 When will I be hearing from you in response to my questions? There are major decisions coming soon for me regarding my property and retirement – this levee plan severely impacts the flexibility I had regarding the sell or not to sell considerations. If my house is in the way, I am sure it will be taken. If it takes another 10 years for the Plan to be finalized and funded, how will I be able to sell my home when my husband and I finalize our retirement plans??!!! Who will buy a home slated
27-2 for demolition to make way for a levee project????? So – will I be able to have the "non-Federal sponsor" purchase my home from me when I need to leave, regardless of how far along the implementation of the Plan has proceeded? If nothing happens at all with the Plan – but all this is there when someone does a title search before purchasing the property in , say, 15 years – my property value is still diminished.

27-3 2 When will I know if this plan has been funded/approved? How will you contact me?

3 I have spoken to 32 neighbors living along Mosher Slough on Monticello, Mason, Hamilton,
27-4 Yarmouth and West Creek Drives, and of those 32 only 4 confirmed that they had received a letter from the Department of the Army. Were letters not sent to each resident on Mosher Slough? Please, MAY

THE DEADLINE FOR COMMENTS/QUESTIONS BE EXTENDED so those who were unaware of the USACE proposals regarding the levees might have time to submit their concerns??

4 Would the trees bordering the Slough (riparian area) be removed before the Plan was
finalized/funded?? It would be awful to have demolished a beautiful and richly diverse riparian area
27-5 and then find out the Plan had not been funded, or may not be funded for another 10 or 12 years.
What a waste!!! Of course, I am deeply concerned about losing the trees around my property; they
provide invaluable shade/coolness and protection from drying westerly winds. I am sure the property
value of this home will diminish if it stands next to a broiling open wasteland. Does this mean I would
27-6 be paid less for it if/when it is acquired to make way for the Plan?? Is this part of the plan....? To
diminish the value of the property before acquiring it???!! Another concern regarding the
trees/vegetation- In the copy of the study done by ACE, I read one short paragraph and saw one
table which addressed the loss of habitat for all the wildlife this riparian area supports - - pretty short
27-7 shrift. It in no way really describes the number of bird species which live here (and those who are
here each year during migration periods)nor does it describe the wide range of other animals here –
river otters, beavers, many varieties of fish, etc., etc. In balance, the questionable necessity of doing
levee work here does not make a good argument for the destruction of such an area in Stockton.

5 What are mitigation banks credits (mentioned 3.7.3 Impact Analysis…)? I assume this means in
27-8 any case, no planting of any kind would take place on the levee.

6 The “levee height fix” mentioned in Table 4-2 (7a/b Measures by Area and Waterway) –
27-9 according to the Plan, how much higher than the current height does the levee have to be? How
much added? (in feet)

7 I have invested much time, effort and MONEY into my home – it represents much of my
retirement fund. Given my home’s position relative to the current levee, I believe my home would be
one of the “294 permanent relocations” mentioned in 8.1.4 Real Estate. How would I be recompensed
27-10 for the loss of my home? “Fair market value” is a figure which may be determined in many ways –
how would this value be figured in this case? Who determines fair market value? When would I be
notified if my parcel is one which would acquired by the “non-Federal sponsor”? What kind of lead time
would I have to find another home?

8 If I have no choice regarding the acquisition of my home by the “non-Federal sponsor” would
27-11 there be any mitigation of State or Federal taxes on monies paid to me for the house? (if I had no new
home in which to invest the “earnings” from the “sale” of my property)

27-12 9 What is the timeline for all of this? I have read/heard three different things.

10 A : I looked at records of past floods in Stockton. In none of the information available did I
27-13 find any record of neighborhoods adjacent to Mosher Slough flooding. There were no reports of
seepages, “boils”, breaks that I could find. On the map (figure 2.2 1/500 ACE floodplain) showing

depth of flooding in this 500 year event, the big red dots indicate places on the levee system which "fail
R&U criteria". None of them are on Mosher Slough. Does this mean that there is less likelihood of a
breach occurring on this levee? If the flood water on the map comes from a breach in one of the "red
dot" locations (as I was told by one of the people I spoke to last Wednesday evening at the Q&A at
Civic Auditorium), why not fix the "red dot" location and leave the rest? Work was done on this levee
about five years ago. If there were other real problems, would they not have been addressed (or least
would we not have had some indication/notification) then?

>>>>>>>10 B: I am unconvinced that rising sea levels will impact this Mosher Slough levee for
some time – if ever. A breach right now in a levee to the east of us would have little impact on this
neighborhood – there is not enough water in those channels to water my azaleas for a week. So the
main concern for flooding here comes from large amounts of drainage from upstream due to high levels
of precipitation sometime in the future. I understand that sometimes one must prepare for the worst,
and hope for the best….but I have been reading A LOT of literature regarding climate change and
27-14 DROUGHT conditions/diminishing rainfall in California in the coming decades. "The odds" are that we
will not be receiving enough precipitation any time soon to overfill the reservoirs, overburden all the
transitory water storage areas upstream, and lead to a breach/seepage in the banks of the levee in my
back yard. It didn't happen in 1983, 1986, 1995, nor in 1997 (nor before that, that I can find reported
anywhere) – high precipitation (flood) years which had been preceded by some years of normal
precipitation levels, so there was still water in reservoirs and less "storage space" available for excess
water…..still, no flooding here. Do I care about flooding elsewhere in Stockton? Yes. So fix the "weak
spots" which have led to flooding in those areas. HOWEVER - There is no historical basis to support
building up the levee on Mosher Slough.

11 I assume the reason that the USACE used figures for a 500 year event (rather than the 200 year
27-15 event figures required by California state regulations) is because of the use of Federal funds to
implement this Plan. Yes? No?

12 When I read about the "benefits" of the plan, these are dollar figures. These amounts represent
how much money would NOT be paid out by agencies such as FEMA etc., because flooding would be
27-16 limited/eliminated by implementing the Plan – is that correct? That's the benefit of the plan? Is this
a "net" figure? Does is take into consideration the cost of this entire project???

13 If there was this much concern about flooding in this area, why did the city/county management
allow continued development here? (Yes, I will be asking the city and county about this) You may
27-17 ask if I looked at a map indicating flood plains before purchasing my home. Yes I did. I have two
friends who have spoken to me about that map – one a hydrologist, and the other a geologist. There
are VERY few places in California's Central Valley which are not technically in a flood plain. That's why
I have flood insurance. So, with the implementation of Plan 7a, or one like it, should I drop my flood
insurance???

14 If "runoff from the area upstream of Thornton Ave is less than 800cfs for a 10% event and does
not meet the minimum flow required to establish Federal Flood Control Authority" this is yet another
27-18 reason to maintain the Mosher Levee as it is rather than spend a great deal of tax payer dollars on
unnecessary levee improvements .

I'm out of time. It's midnight. So other concerns will just have to wait for other opportunities to be
27-19 aired. In case I have not been clear, I AM NOT IN FAVOR OF IMPROVEMENTS ON MOSHER SLOUGH

LEVEE, and will be talking about this to any congress person who will listen – even a little.

From: M Drew
To: Stalker, Tyler M SPK
Subject: [EXTERNAL] Mosher Slough Levee Changes
Date: Monday, April 13, 2015 10:55:25 PM

Dear Sir:

Questions we have:

28-1 1. Why was this process not advertised in local newspaper(s). A meeting was held on 4/8/15, from 1800-2000 hours; however, we observed no notice of such in the Stockton Record.

28-2 2. When will plans be finalized?

28-3 3. How will real estate values be determined if encroachment on existing yards is necessary?

28-4 4. What impact will this activity have on home values?

28-5 5. How will we be able to sell our homes if this activity is found during a title search?

28-6 6. How far in advance of actual construction will home owners be notified?

28-7 7. Will vegetation removal be one of the first activities? Does this include Valley Oaks?

28-8 8. After today, who and how can we contact someone with concerns?

These are just a few questions we have with a cursory reading of the project proposal.

Thank you.

Marlene R. Drew and Otis C. Kelley, Jr.
[redacted]

From: Michael Elium
To: Stalker, Tyler M SPK
Subject: [EXTERNAL] opposition to proposed changes in the levee on Mosher Slough
Date: Monday, April 13, 2015 10:41:12 PM

Dear Mr. Stalker,

I am a resident of West Creek Drive in Stockton, with my home backing up to the Mosher Slough levee.

29-1 I am opposed to the implementation of Plan 7a.

29-2 I request that another public meeting be held, with more notice provided to the homeowners.

Sincerely,

Michael Elium, Ed.D.

Assistant Dean, External Programs

Coordinator, Special Education Programs

Benerd School of Education

University of the Pacific

3601 Pacific Ave.

Stockton, CA 95211

(209) 946-2336

From: Derek Skeels
To: Stalker, Tyler M SPK
Subject: [EXTERNAL] Mosher Slough 7A improvements
Date: Monday, April 13, 2015 9:33:03 PM

Hello Tyler,
My name is Derek Skeels and I am a resident of Stockton who's property is attached to the south
bank of Mosher Slough. I'll make this letter short and to the point since I'm sure you've gotten a
handful of angry emails today. I've read through a large portion of the plans and I think I have a
general understanding of the work to be done on Mosher Slough that will directly effect myself and my
neighbors. Id like to start by saying, thank goodness for my neighbors. I, along with about 90% of
Monticello Dr. had no idea of the proposed plans for work on Mosher Slough. It seems about 1/5 homes
30-1 received a letter in the mail with a notice of the proposed plans. Seems pretty shady that there are
plans as significant as this being pushed through the citizen/public comment phase. I never received a
letter.

I couldn't help but notice that the odds of having the 500 year flood are a dismal 0.2%. If I were a
gambling kind of guy, I wouldn't be investing my money in the plans you guys have proposed. Updating
levees and waterways in targeted portions doesn't seem like a great way to save the residents of
stockton from a flood. If levees will not flood in my backyard due to new improvement, but will flood a
30-2 half mile down the road which will reach me in the case of a 500 year flood anyways, I don't see the
benefit. Im not an engineer, nor did I major in risk management, but It seems to me that improvements
to just the south side of the levee doesn't do much for the citizens on the north side. Levee
maintenance is a must, but I've seen the Mosher Slough stretch from Pershing Ave to Kelley Dr.
improved and strengthened over the last few years with riprap, which did not involve impingement into
peoples property.

The diagrams presented in the plans shows what the levee raising is. The Mosher Slough Levee
already runs right up to the back of all the properties on Monticello Dr. and surrounding courts. A larger
levee would decrease our yard size considerably. Also, there is mention of needing an easement access
at the foot of the levee for an additional 10-15 feet. This would effectively reduce my back yard by
around 50%, leaving my property near worthless. While the total cost of 800 million dollars dwarfs what
my property is worth, it is still my hard earned property. Stockton home vales are finally on the rebound
30-3 and a project like this that would reduce my property size by about 25% would literally make my house
value fall to less than what I owe on it, leaving me underwater. No pun intended. This home value hit
would not only effect me, but every resident on Mosher Slough. the neighborhood is a working class
neighborhood. The economic impact of the devaluation of everyones property would be larger than I
believe estimated. You're kicking the the horse while its trying to get back on its feet so to speak.
There are several families who's house falls within the intended levee easement zone. Im sure you
personally would not want your house taken from you in an event like this.

Im also not a biologist, but one of the greatest parts of the Mosher Slough is the established wildlife.
There are red ear slider turtles that breed every year in the slough. Their babies are seen sun bathing
on the banks and on logs. Numerous species of ducks and waterfowl nest in the slough. They raise
their young and then migrate when winter comes. Every fall, I have seen groups of salmon migrating up
30-4 the slough on their annual spawning run. With the proposed vegetation stripping to prepare for the
levee work, the entire ecosystem will be destroyed. The large oak trees that provide shade for my family
in the hot summer will be cut or bulldozed over due to the increased size of the levee and vegetation
clearing.

30-5 Theres not much else for me to say. Most of my concerns have been voiced here. Should these
proposals be approved, and our property bought from us, it is never a fair market value, so its not even
worth me asking questions about how or who will provide the property valuation. Its an 800 million
30-6 dollar investment with the hope of saving citizens life and property. With todays technology, the
legitimate threat to life from the 0.2% 500 year flood is even smaller than the chance of the flood itself.
So now the main goal is the protection of property? Im sure insurance agencies are all hands on deck in
30-7 support of a plan like this. I personally pay for flood insurance because of the minuscule chance of the

500 year flood, I don't also need my local and federal tax dollars spent on additional 500 year flood protection and my house value decreased all in one fell swoop.

30-8 I appreciate the ILL advertised chance to voice my opinion about the plans, and also realize that there is a lot to do before these plans fall into place or are even ever approved. There are years between today and when these plans are dated to take place, but I believe that there are better options than Plan 7A.

Derek Skeels

From: Mikayla Meyling
To: Stalker, Tyler M SPK
Subject: [EXTERNAL] Plan 7A, Levee @ Mosher Slough in Stockton, CA
Date: Monday, April 13, 2015 7:13:50 PM

To whom it may concern.

31-1 I am a very concerned resident in the Northwestern Stockton neighborhood being considered for plans in "levee improvement". Please understand my (and OUR, since there are many of us being incredibly negatively affected) genuine and heartfelt concern over this pending decision. If this plan were to be put into affect, families would be forced to relocate from one of the last (of not absolute only) favorable locations in the Stockton area.

My mother and father just purchased their beautiful home here less than two years ago and love where they live. I love where they live. This "plan" is outrageous and to put it mildly-- UNFAIR. There have to be solutions that don't include uprooting families. Please take our pleas into consideration. It would be appreciated so much.

Thank you,

Mikayla Meyling

From: Elizabeth Meyling
To: Stalker, Tyler M SPK
Subject: [EXTERNAL] Levee improvements on Mosier Slough
Date: Monday, April 13, 2015 6:45:47 PM

32-1 As a resident whose property backs up to this beautiful oasis, I am completely against the proposed "levee improvements". My home in particular would be one of the properties that would fall within the 10 to 15 foot easement. The beautiful, statuesque oak trees would be removed displacing an assortment of wildlife. This area in particular makes one feel like we are not in Stockton. Many people enjoy exercising & nature watching etc along this stretch. It is truly beautiful. I would hate to see my home demolished and if that were the case, how would the real estate value be determined? If I decided to sell my home now this would be a part of the title search! This is heartbreaking news for everyone living along this levee. It seems an extremely dramatic and drastic change. The water level here is very low year round. I hope the concerns of we as human beings and residents who wish to live here forever will be more than considered. As I write this from my back patio, I am admiring the true beauty that is Mosier Slough.

Sincerely,
Elizabeth Meyling
8536 Hamilton Way
Stockton, CA. 95209
209-513-4704

April 8, 2015

U.S. Army Corps of Engineers
Sacramento District
ATTENTION: Ms. Tanis Toland
1325 J Street
Sacramento, CA 95814-2922

SUBJECT: San Joaquin River Basin, Lower San Joaquin River, CA "DRAFT" Integrated Interim Feasibility Report/ Environmental Impact Statement/Environmental Impact Report

Ms. Toland

As one of many residents and landowners in the area of south Manteca, located in the area of RD17 levee, I have many concerns about what the City of Manteca is proposing in relation to the Proposed levee extension. There are many of us who have homes, and small farms as well as those with orchards, vineyards, dairies, And hog farms.

In reading your February 2015 report, I have concerns about the
lasting and irreversible out-come to the loss of our rich farm-land and
33-1 water supply. The end result being, city and county residents, will be
affected by this irreversible loss.

The city of Manteca is proposing a massive expansion of the existing
RD17 levee beyond the scope of what is needed. Perhaps the City
should not have allowed the building of homes in the flood plain to
begin with. I understand how it may have become necessary for the
33-2 city to protect these existing homes but not to the extent the city of
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advantage of an opportunity to expand its' borders. Perhaps, the City
of Manteca should consider placing a hold on building in those areas
known to be in the flood plain. We are in the middle of a terrible
drought.

33-3 Our concerns are for the effects slurry walls, which will certainly be put in place to protect the levee from seepage, will do to our environment.

1. Wells (**pages 5-53, 5-54, 5-55)
2. Ground water depth (**5-54, 5-55)
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33-4 to oppose this massive expansion of the City of Manteca's proposed levee extension.

Respectfully,

Howard Holtom

Name

Address [redacted]

**see San Joaquin River Basin Lower San Joaquin River, CA DRAFT Integrated Interim Feasibility Report/Environmental Impact Statement/Environment Impact Report

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Respectfully,

Name Brenda Costa
Address [redacted]

**see San Joaquin River Basin Lower San Joaquin River, CA DRAFT Integrated Interim Feasibility Report/Environmental Impact Statement/Environment Impact Report

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Respectfully,

Name

Address [redacted]

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Respectfully, Albert J Dozuene [redacted]

Name
Address

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Respectfully,

Sharon Van Zuidewenburg

Name
Address

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Respectfully, Kirsten Thompson

Name Kirsten Thompson [redacted]
Address [redacted]

**see San Joaquin River Basin Lower San Joaquin River, CA DRAFT Integrated Interim Feasibility Report/Environmental Impact Statement/Environment Impact Report

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Respectfully,
Ken Kunde

Name [redacted]
Address

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Respectfully, Gail Ann Wilhite

Name Gail A. Wilhite
Address [redacted]

**see San Joaquin River Basin Lower San Joaquin River, CA DRAFT Integrated Interim Feasibility Report/Environmental Impact Statement/Environment Impact Report

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Respectfully,

Name Shirley Sadler
Address [redacted]

**see San Joaquin River Basin Lower San Joaquin River, CA DRAFT Integrated Interim Feasibility Report/Environmental Impact Statement/Environment Impact Report

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1325 J Street
Sacramento, CA 95814-2922

SUBJECT: San Joaquin River Basin, Lower San Joaquin River, CA "DRAFT" Integrated Interim Feasibility Report/ Environmental Impact Statement/Environmental Impact Report

Ms. Toland

As one of many residents and landowners in the area of south Manteca, located in the area of RD17 levee, I have many concerns about what the City of Manteca is proposing in relation to the Proposed levee extension. There are many of us who have homes, and small farms as well as those with orchards, vineyards, dairies, And hog farms.

In reading your February 2015 report, I have concerns about the lasting and irreversible out-come to the loss of our rich farm-land and water supply. The end result being, city and county residents, will be affected by this irreversible loss.

The city of Manteca is proposing a massive expansion of the existing RD17 levee beyond the scope of what is needed. Perhaps the City should not have allowed the building of homes in the flood plain to begin with. I understand how it may have become necessary for the city to protect these existing homes but not to the extent the city of Manteca is proposing. It seems as though the City is taking advantage of an opportunity to expand its' borders. Perhaps, the City of Manteca should consider placing a hold on building in those areas known to be in the flood plain. We are in the middle of a terrible drought.

Our concerns are for the effects slurry walls, which will certainly be put in place to protect the levee from seepage, will do to our environment.

1. Wells (**pages 5-53, 5-54, 5-55)
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7. Flood waters will rise in areas where it was a borderline incident in the past due to water displacement in areas due to levee construction in areas previously flooded

Thanking you in advance for giving us the opportunity to respond to the " Integrated Interim Feasibility Report/Environmental Impact Statement/Environmental Impact Report". I would like to urge you to oppose this massive expansion of the City of Manteca's proposed levee extension.

Respectfully,

Name Leonard [illegible]
Address

**see San Joaquin River Basin Lower San Joaquin River, CA DRAFT Integrated Interim Feasibility Report/Environmental Impact Statement/Environment Impact Report

April 8, 2015

U.S. Army Corps of Engineers
Sacramento District
ATTENTION: Ms. Tanis Toland
1325 J Street
Sacramento, CA 95814-2922

SUBJECT: San Joaquin River Basin, Lower San Joaquin River, CA "DRAFT" Integrated Interim Feasibility Report/ Environmental Impact Statement/Environmental Impact Report

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Respectfully,

Frank R Mendes

Name FRANK RAYMOND MENDES
Address [redacted]

**see San Joaquin River Basin Lower San Joaquin River, CA DRAFT Integrated Interim Feasibility Report/Environmental Impact Statement/Environment Impact Report

April 8, 2015

U.S. Army Corps of Engineers
Sacramento District
ATTENTION: Ms. Tanis Toland
1325 J Street
Sacramento, CA 95814-2922

SUBJECT: San Joaquin River Basin, Lower San Joaquin River, CA "DRAFT" Integrated Interim Feasibility Report/ Environmental Impact Statement/Environmental Impact Report

Ms. Toland

As a resident of the City of Manteca, I am concerned about what the City of Manteca is proposing in relationship to the proposed levee extension in the area of the RD17 levee. Even though I do not live in the immediate area, I still have some concerns.

In reading your February 2015 report, I have concerns about the lasting and irreversible out-come to the loss of our rich farm-land and water supply. The end result being, city and county residents, will be affected by this irreversible loss.

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Respectfully,

Name John Peters
Addres[redacted]

**see San Joaquin River Basin Lower San Joaquin River, CA DRAFT Integrated Interim Feasibility Report/Environmental Impact Statement/Environment Impact Report

April 8, 2015

U.S. Army Corps of Engineers
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Name
Address
[redacted]

**see San Joaquin River Basin Lower San Joaquin River, CA DRAFT Integrated Interim Feasibility Report/Environmental Impact Statement/Environment Impact Report

April 8, 2015

U.S. Army Corps of Engineers
Sacramento District
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Respectfully,

Name Bob Nunes [redacted] Bob Nunes
Address [redacted]

**see San Joaquin River Basin Lower San Joaquin River, CA DRAFT Integrated Interim Feasibility Report/Environmental Impact Statement/Environment Impact Report

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Respectfully,

Vanessa Weeks

Name VANESSA WEEKS

Address [redacted]

**see San Joaquin River Basin Lower San Joaquin River, CA DRAFT Integrated Interim Feasibility Report/Environmental Impact Statement/Environment Impact Report

US Army Corps of Engineers

SJAFCA San Joaquin Area FLOOD CONTROL Agency

Public Comment Sheet

NAME: Michael Fonseca PHONE: [redacted]

ADDRESS: [redacted]

E-MAIL: [redacted]

COMMENT/QUESTION:

I own property at [redacted] I am concerned with the alignment and design of RD 17 levee extension segmenting my property and the adverse impacts it will have to my farming operation. I farm property on both sides of the existing levee and the future proposed extension. I want to be informed on the process and time frame within each event or study that is projected to be completed. I have concerns with my irrigation water, wells, and other water sources that will be impacted with the ~~Proximity~~ Proximity of the levee. I want to be added to all the 408 and all mailing lists that pertains to the RD-17 levee.

US Army Corps of Engineers

San Joaquin Area FLOOD CONTROL Agency

pg 2

Public Comment Sheet

NAME: Fonseca, Michael PHONE:

ADDRESS:

E-MAIL:

COMMENT/QUESTION:

New Levee - Cuttoff walls?

How will this affect wells

How affect water table in the area?

W/in the easement. the ~~oil~~ head depends to on the

easement What is the easement distance

What if my well falls within the easement or w/in 30 or 50'

of the easement. Will my well be too close to the levee.

What if existing infrastructure that falls w/in new levee easement

The proposed extension is 20' from my bedroom

window + 35' to brothers door.

Have domestic + ag wells. If move levee 900 ft

south that would avoid all of the infrastructure = the

southern border. No other infrastructure on the side

Would move North, but would have ? a density of homes.
+ segregate property. Has 3 dif wells
What are my personal impacts and the impacts on the community
Septic tank - Would be within 10 ft of the levee.

Not in loop

Monitor Bulletin - Not widely distributed

US Army Corps of Engineers

SJAFCA San Joaquin Area Flood Control Agency

Public Comment Sheet

NAME: DONALD J GALLAGHER PHONE: [redacted]

ADDRESS: [redacted]

E-MAIL: [redacted]

COMMENT/QUESTION:

LEVY IN DISTRICT 17, IS PROPOSED TO BE PLACED BETWEEN PEACH AVE + FIG AVE IN THE MIDDLE OF 3 OF MY VINEYARDS. THESE VINEYARDS HAVE BEEN PRODUCING SINCE 1965 + OR 50+ YEARS. WHY SHOULD THIS LEVY DISRUPT MY OPERATION OF 50 YEARS. WHY CAN'T THIS BE PLACED ON THE PROPERY LINE NOT TO DISRUPT MY OPERATION

US Army Corps of Engineers

SJAFCA San Joaquin Area FLOOD CONTROL Agency

Public Comment Sheet

NAME: Mary Ann + Steve Schermerhorn PHONE: [redacted]

ADDRESS: [redacted]

E-MAIL: [redacted]

COMMENT/QUESTION:

50-1 The "7a" proposal would be of great value to our neighborhood (the "Country Club" neighborhood). We support this proposal, and hope Congress will fund it right away. Thank you.

US Army Corps of Engineers

SJAFCA San Joaquin Area FLOOD CONTROL Agency

Public Comment Sheet

NAME: Sally Hopson PHONE: [redacted]

ADDRESS: [redacted]

E-MAIL: [redacted]

RD-17 Section 408

COMMENT/QUESTION:

51-1 I would like to protest the current Levee proposal that will split my property in half. How can I farm my land when it is cut in half.
51-2 Please check into dredging the River.
51-3 Also please look into running the existing levee which ends on West side of Airport down parallel w/ Airport way.
51-4 There are many families whose land will flood if you continue on present course. take the course that will protect the most famili

US Army Corps of Engineers

SJAFCA San Joaquin Area FLOOD CONTROL Agency

Public Comment Sheet

NAME: Connie Hoffman PHONE: [redacted]

ADDRESS: [redacted]

E-MAIL: [redacted]

COMMENT/QUESTION:

I want to know why the Army Corp. of Engineers don't Dredge out the S.J. River. My family has owned + resided on Oleander Road in Manteca (in between Fig + Peach Ave.) for 95 years. We have
52-1 Never flooded! If you drive out there you will find us on a Natural Hill. We are 17 ft. higher then the City of Manteca. I believe you need to dredge the River out making the waterway deeper + wider + re-enforce the existing Levee's why put new levees into prime Farmland and destroy someone's home which contains So much for our family

April 23, 2015

Tyler Stalker, Public Affairs Specialist
U. S. Army Corps of Engineers
1325 “J” Street
Sacramento, CA 95814-2922

Project: San Joaquin River Basin, Lower San Joaquin County, California Draft Integrated Interim Feasibility Report, Environmental Impact Statement, Environmental Impact Report (FR/EIS/EIR)

District CEQA Reference No: 20150136

Dear Mr. Stalker:

The San Joaquin Valley Unified Air Pollution Control District (District) has reviewed the Draft Integrated Interim Feasibility Report/Environmental Impact Statement/Environmental Impact Report (FR/EIS/EIR) to assess the impact of the project intended to improve flood risk management problems and opportunities in the Lower San Joaquin River basin by repairing and enhancing the levees that surround the City of Stockton.

The Lower San Joaquin River study area is located along the lower (northern) portion of the San Joaquin River system in the Central Valley of California. The San Joaquin River originates on the western slope of the Sierra Nevada and emerges from the foothills at Friant Dam. The river flows west to the Central Valley, where it is joined by the Fresno, Chowchilla, Merced, Tuolumne, Stanislaus, Calaveras rivers, and smaller tributaries as it flows north to the Sacramento-SanJoaquin Delta. The study authorization includes the main stem of the San Joaquin River from the Mariposa Bypass downstream to the city of Stockton. The study area also includes the distributary channels of the San Joaquin River in the southernmost reaches of the Delta: Paradise Cut and Old River as far north as Tracy Boulevard and Middle River as far north as Victoria Canal. The refined study area focused on approximately 305 square miles encompassing incorporated areas of Stockton, Lathrop and Manteca as well as unincorporated portions of San Joaquin County.

This Draft FR/EIS/EIR describes the planning process followed to develop and evaluate an array of alternatives to address flood risk management problems and opportunities in the Lower San Joaquin River basin which would be used to identify a Tentatively Selected Plan (TSP) for recommendation to the United States Congress for authorization. The alternatives described in the Draft FR/EIS/EIR are as follows: Alternatives 7a, 7b, 8a, 8b, 9a, 9b. Alternatives activities would include any of the following: levee improvements of cutoff wall, deep soil mixing (seismic), flood bypass, levee extension, and new levee segments.

The District makes the following comments regarding these alternatives:

1. <u>Construction – Fugitive dust emissions</u>

53-1 ***The Road Construction Emission Model (RCEM) results were not included within the Draft FR/EIS/EIR. These RCEM results used to estimate the construction and fugitive dust emissions should be submitted to the District to allow the District to assess the project's potential impact on air quality.***

The Draft FR/EIS/EIR states that the emissions shown in the tables (*Alternative Annual Construction Emissions*) already accounted for fugitive dust reductions required by District Regulation VIII. The District notes that although compliance with Regulation VIII substantially reduces project specific fugitive dust emissions, it may not be sufficient to reduce project specific emissions to less than significant levels. Referral documents should include the Road Construction Emission Model results that were used to estimate the construction and fugitive dust emissions and emissions reduced through compliance with Regulation VIII.

2. <u>Construction - NOx Emissions</u>

The District recommends that Draft FR/EIS/EIR include a description clarifying how the mitigation measures for reducing construction exhaust emissions will implemented and enforced, i.e. through permit conditions, agreements, or other legally binding instruments as required by CEQA Guidelines §15126.4, subdivision(a)(2).

53-2 The Draft FR/EIS/EIR identifies the listed alternatives: 7a, 7b, 8a, 8b, 9a, 9b. It concluded that construction NOx emissions for these alternatives would have a potentially significant impact on air quality but with mitigation the impact would be reduced to a less than significant impact.

The mitigation measures identified in the Draft FR/EIS/EIR would focus on reducing NOx emissions by requiring either Tier 3 equipment for all off-road vehicles, <u>or</u> enter into a Voluntary Emission Reduction Agreement (VERA) with the District. Per the Draft FR/EIS/EIR, the VERA would require payment of a fee to the District that would be used by District to purchase NOx emission reductions that would be used to offset all NOx emissions during years when the Project's unmitigated NOx emissions exceed ten tons per year.

The District notes that in order to conclude that the construction exhaust emissions would be less than significant, mitigation measures reducing construction exhaust emissions must be fully enforceable through permit conditions, agreements, or other legally binding instruments (CEQA Guidelines §15126.4, subdivision(a)(2)).

3. Voluntary Emission Reduction Agreement (VERA)

The District recommends the following phrasing for the Voluntary Emission Reduction Agreement:

53-3 ***"Six months prior to the commencement of construction, the project proponent shall enter into a Voluntary Emissions Reduction Agreement (VERA) with the San Joaquin Valley Air Pollution Control District (SJVAPCD) to mitigate construction and operational project emissions for criteria pollutants to less than significant levels."***

The District appreciates that a VERA is listed as a potential mitigation measure for reducing project NOx emissions. A VERA is a mitigation measure by which the project proponent provides pound-for-pound mitigation of emissions increases through a process that develops, funds, and implements emission reduction projects, with the District serving a role of administrator of the emissions reduction projects and verifier of the successful mitigation effort. To implement a VERA, the project proponent and the District enter into a contractual agreement in which the project proponent agrees to mitigate project specific emissions by providing funds for the District's Incentives Programs.

4. Reporting and Monitoring Program

Prior to certifying the FR/EIS/EIR document, it should be revised to include the reporting and/or monitoring program for the proposed mitigation measures (i.e., TIER III or VERA) and be made available for public review.

53-4 The Draft FR/EIS/EIR states that *"Upon certifying the document, the CEQA lead agencies would adopt a reporting or monitoring program for the changes made to the project or the conditions of project approval to mitigate or avoid significant effects on the environment. Full compliance would be achieved when the Final FR/EIS/EIR and Notice of Determination (Statement of Overriding Consideration) is submitted to the Office of Planning and Research."* It is unclear how the lead agencies would pursue and enforce the mitigation options (i.e., Tier III or VERA), and it is unclear whether an opportunity to review the reporting and/or monitoring program will be provided.

5. Greenhouse Gas (GHG) Emissions

53-5 ***On page 5-82 of the Draft FR/EIS/EIR, "SJVAPCD has developed screening levels for GHG emissions for projects for which it is lead agency. However, SJVAPCD's GHG thresholds do not apply to projects for which it is not the lead agency (Willis, J. pers. comm.)" should be removed as it is incorrect.***

District Policy <u>Addressing GHG Emission Impacts for Stationary Source Projects under CEQA When Serving as the Lead Agency</u> and District Guidance <u>Guidance for Valley Land-Use Agencies in Addressing GHG Emission Impacts for New Projects under CEQA</u> can be used by lead agencies to assess the significance of GHG impact.

On December 17, 2009, the District's Governing Board adopted the District Policy: *Addressing GHG Emission Impacts for Stationary Source Projects under CEQA When Serving as the Lead Agency*.

In addition, the District's Governing Board also approved the guidance document: *Guidance for Valley Land-Use Agencies in Addressing GHG Emission Impacts for New Projects under CEQA.* This guidance is intended to assist Valley land-use agencies in addressing the impacts of greenhouse gases (GHG) in their role as lead agency for California Environmental Quality Act (CEQA) purposes. This guidance establishes a streamlined process that can be used to evaluate the significance of project specific GHG emission impacts on global climate change, based on the use of Best Performance Standards to reduce project specific GHG emissions. In support of the policy and guidance document, District staff prepared a staff report: *Addressing Greenhouse Gas Emissions under the California Environmental Quality Act*. These documents adopted in December of 2009 continue to be the relevant policies to address GHG emissions under CEQA.

District Policy and Guidance do not preclude a lead agency from developing and establishing its own GHG guidance and thresholds of significance.

The District appreciates the opportunity to comment on the *Draft FR/EIS/EIR*. If you have any questions or require further information, please call Debbie Johnson at (559) 230- 5817.

Sincerely,

Arnaud Marjollet
Director of Permit Services

Chay Thao
Program Manager

AM:dj

TR Land Company, LLC
2800 W. March Lane Suite 360
Stockton, CA 95219
(209) 476-1927

April 13, 2015

Tyler Stalker
U.S. Army Corps of Engineers
1325 J Street, Room 1513
Sacramento, CA 95814

Subject: Lower San Joaquin River Draft Feasibility Study;
Applicability of EO 11988 to Reclamation District 17

Dear Mr. Stalker:

We are responding to the Lower San Joaquin River Draft Feasibility Study released by the U.S. Army Corps of Engineers (USACE). Please accept this letter as formal comments from TR Land Company, LLC.

The identified overall purpose of the Lower San Joaquin River Feasibility Study (LSJRFS) is to "reduce flood risk to urban and urbanizing parts of the study area. The Non-Federal Sponsors' objective is to meet the requirements of California Senate Bill (SB) 5 of 2007, the Central Valley Flood Improvement Act, to achieve a 200-year level of protection for the urban and urbanizing areas within the Study Area."

54-1 TR Land Company disagrees with selection of Alternative 7a as the Tentatively Selected Plan (TSP). We do not believe that Alternative 7a will adequately meet the flood risk reduction objective or the 200-year level of protection objective. We are asking that RD17 Alternatives not be removed from further consideration in the Draft Feasibility Study (7b, 8b, 9b). If not removed from the Feasibility Study, we believe Alternative 7b would become the TSP and would include RD17 improvements.

Based upon our review and analysis of the matter, we have the following specific concerns:

54-2 1. Removal of RD17 Improvements from the Feasibility Study Appears to Conflict with Prior Federal Actions. For over 165 years, RD17 levees have been endorsed by Congress, the USACE and by FEMA to provide protection for development. We fail to understand why the USACE chose a different analysis methodology to determine that the RD17 levees do not provide 100-year flood protection, when those levees have been certified by FEMA for 25 years.

54-3 2. FEMA is Responsible for Certifying 100-Year Levee Protection, yet we are concerned with the recent statements by the USACE that the FEMA certification may not be relied upon regarding RD17 levees.

54-4 3. The USACE interpretation of EO 11988 appears overstated when it states the RD17 levees do not provide 100-year flood protection and should not be improved to provide 100-year protection. We would like to understand the impact of this EO 11988 interpretation on proposed large, federally funded projects within RD17. We would also like to understand the impact on Federal facilities in RD17 if levees cannot be improved to provide 200-year flood protection.

54-5 4. The USACE can Change the TSP in the Final Feasibility Report. All potential impacts of RD17 improvements are documented and analyzed in the Draft EIS/EIR, so the USACE can determine in the Final LSRFS that the TSP has changed to Alternative 7b. We are asking the USACE to make this change.

54-6 5. If RD17 Improvements are not in the TSP, 43,000 People Remain at Risk. The Draft plan states that the current TSP will result in no additional risk reduction for 43,000 people and critical infrastructure in RD17. We understand this to mean that the USACE has determined that the RD17 levees do not provide 100-year protection, and they do not believe they should be improved to provide that protection. The LSJRFS confirms that the USACE does not have land use authority. FEMA continues to certify 100-year protection from RD17 levees. New development in areas of the 200-year floodplain that are less than three feet deep would not be stopped from development by SB5. We are concerned that these expanded development areas, along with the 43,000 existing residents, would be precluded from improved levee protection by excluding RD17 from the Feasibility Study.

54-7 6. The current TSP recommends approval of a $1 billion levee improvement project located in the City of Stockton. This project will require hundreds of millions of dollars in local funding. The local match would be very difficult for any city to fund from a mostly developed area, as there is no mandate for this additional protection for an already developed area. Also, construction of levees that increase protection beyond 100-year will not result in any reduction in flood insurance rates if FEMA already certifies 100-year flood protection. We are concerned about how the improvements can actually be built if the local share cannot be funded.

54-8 7. RD17 and local municipalities are ready to improve our levees. RD17, in conjunction with DWR, completed Phases 1 and 2 of their recent levee improvements. Phase 3 improvements are being reviewed now by the USACE. RD17 is cooperating with the cities of Lathrop and Manteca in preliminary design of ULOP improvements to provide RD17 with 200-year flood protection. Lathrop has applied for an Urban Flood Risk Reduction Grant from the State to share the cost of designing ULOP levee improvements. And finally, the Flood Protection General Plan Amendment has been drafted and delivered to the Flood Protection Board for review, as required by SB5. It is only because there is new development proposed for these areas protected by RD17 that each municipality and jurisdiction can afford to pay its share of the levee improvement costs.

54-9 In summary, land within the limits of RD 17 has already been flood protected, approved for development, annexed, and has urban infrastructure in place. We believe that inclusion of this land within the Lower San Joaquin River Feasibility Study should not conflict with EO 11988. If you have any questions regarding this letter, please feel free to call me at the number above or email me at eddie@atlaspropertiesinc.com.

Sincerely,

TR Land Company, LLC

By____________________
Edward A. Barkett

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

April 27, 2015

Ms. Alicia E. Kirchner
Chief, Planning Division
U.S. Army Corps of Engineers
Sacramento District
1325 J Street
Sacramento, California 95814-2922

Subject: Lower San Joaquin River Feasibility Study Draft Environmental Impact Statement / Environmental Impact Report, San Joaquin County, California [CEQ# 20150044]

Dear Ms. Kirchner:

The U.S. Environmental Protection Agency has reviewed the Draft Environmental Impact Statement for the Lower San Joaquin River Feasibility Study. Our review and comments are pursuant to the National Environmental Policy Act, Council on Environmental Quality regulations (40 CFR Parts 1500-1508), and our NEPA review authority under Section 309 of the Clean Air Act. We appreciate the additional review time provided by Tyler Stalker to Jean Prijatel on April 1, 2015.

EPA supports the Army Corps of Engineers goal of a durable flood protection system for populations and property in the Lower San Joaquin River study area, and also encourages a broader approach to flood protection and restoration. The Notice of Intent for the project published on January 15, 2010 indicated dual goals of flood damage reduction and ecosystem restoration. We note, however, that this feasibility study has since been limited to analysis of flood risk reduction measures and does not include measures and alternatives for ecosystem and floodplain restoration. The DEIS states that this Feasibility
55-1 Study is to be called an "Interim Feasibility Report", indicating that additional studies under the Sacramento – San Joaquin Basin Streams, California Comprehensive Study authority can be authorized at a future date (page 1-4). In those future studies, EPA recommends an evaluation of the river and basin for the entire extent of the study area that would identify space and suitable conditions for a range of river flows and functions, including reestablishment of floodplains, establishing flood control basins, and conveying water to wetlands. While the DEIS identifies the primary risk of flooding in the study area to be geotechnical failure of existing levees, EPA encourages future evaluation of increased flood carrying capacity to further reduce flood risk for the entire study area.

Based on our review of the DEIS, we have rated the preferred alternative – Alternative 7a – and the document as *Environmental Concerns – Insufficient Information* (EC-2). Please see the enclosed "Summary of EPA Rating Definitions." We recommend that the Final Environmental Impact Statement
55-2 include additional information regarding the impacts to water quality and measures that will minimize those impacts. We also recommend committing to additional measures to mitigate for air quality impacts and applying for a variance to the standard USACE vegetation policies. Finally, we recommend that the

FEIS provide additional information about waters of the United States, impacts from climate change, and implications of the President's January 30, 2015 Executive Order 13690 on flood risk management. Please see the enclosed detailed comments for additional concerns and recommendations.

We appreciate the opportunity to review and comment on this DEIS, and are available to discuss the recommendations provided. When the FEIS is released for public review, please send one hard copy and one CD to the address above (Mail Code: ENF 4-2). Should you have any questions, please contact me at (415) 972-3521, or contact Jean Prijatel, the lead reviewer for the project. Jean can be reached at (415) 947-4167 or prijatel.jean@epa.gov.

Sincerely,

Connell Dunning

FOR Kathleen Martyn Goforth, Manager
Environmental Review Section

Enclosures: Summary of EPA Rating Definitions
EPA Detailed Comments

cc: Adam Laputz, Regional Water Quality Control Board (Central Valley Region)
Jeffrey Stuart, National Oceanic and Atmospheric Administration, West Coast Region
Andy Gordus, California Department of Fish and Wildlife
Katherine Perez, Chairwoman North Valley Yokuts Tribe
Silvia Burley, Chairperson California Valley Miwok Tribe

SUMMARY OF EPA RATING DEFINITIONS*

This rating system was developed as a means to summarize the U.S. Environmental Protection Agency's (EPA) level of concern with a proposed action. The ratings are a combination of alphabetical categories for evaluation of the environmental impacts of the proposal and numerical categories for evaluation of the adequacy of the Environmental Impact Statement (EIS).

ENVIRONMENTAL IMPACT OF THE ACTION

"LO" (Lack of Objections)

The 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)

The 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 the environmental impact. EPA would like to work with the lead agency to reduce these impacts.

"EO" (Environmental Objections)

The 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)

The 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 potentially 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 or 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 analysed 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 analysed in the draft EIS, which should be analysed 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 NEPA 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.

Water Quality

The DEIS discusses Clean Water Act Section 303(d) impairments in the Eastern Delta and the Stockton Deepwater Ship Channel (page 5-44). It identifies potential sources of pollution, lists the impairments, and notes where there are active Total Maximum Daily Load restrictions for these waters. The State Water Resources Control Board's 303(d) list of impaired waters[1] provides additional impairment listings for other water bodies in the study area and the subset of the study area where the preferred alternative proposes levee work and closure structures, including Mosher Slough, Lower Calaveras River, and Smith Canal.

The DEIS acknowledges that water quality eastward of the proposed closure structures on Smith Canal and Fourteenmile Slough would likely degrade with implementation of any of the action alternatives (page 5-48), and identifies this as a significant impact. While these water bodies are on the 303(d) impaired list, the impairments of these water bodies are not specifically discussed in the DEIS and it is unclear which of the listed impairments would be further degraded by implementation of the alternatives. The DEIS states that design and operational criteria for the closure structures would be coordinated with the Regional Water Quality Control Board, National Marine Fisheries Service, and California Department of Fish and Wildlife to minimize water quality impacts.

55-3 ***Recommendations:*** Update the discussion of the 303(d) impaired waters to describe impairments in all water bodies in the study area. Specifically identify which listed impairments would be degraded by the proposed project. In advance of the FEIS, coordinate with the Regional Water Quality Control Board, National Marine Fisheries Service, and California Department of Fish and Wildlife to identify the design and operating criteria that will minimize water quality impacts and commit to those measures in the FEIS and Record of Decision.

Impacts to Waters of the United States

The acreage of wetlands and other waters of the United States identified in the DEIS are not based on a verified jurisdictional delineation. Instead, estimates presented are based on USGS topographic maps, Google Earth Pro, the National Wetland Inventory, and the San Joaquin County Multi-Species Habitat Conservation Plan (page 5-60). EPA's experience is that on-the-ground delineations can be substantially different from estimates based on aerial imagery or maps. The DEIS acknowledges that impacts may be underestimated and states that a formal wetlands delineation will be conducted prior to project construction.

The DEIS includes a draft Clean Water Act 404(b)(1) analysis that includes measures to minimize effects on wetlands and aquatic ecosystems, but does not identify which alternative is the least environmentally damaging practicable alternative. Mitigation measures are proposed to be on-site restoration and purchasing credits from approved mitigation banks.

55-4 ***Recommendations:*** EPA recommends completing a jurisdictional delineation prior to publication of the FEIS and including updated quantity and locations of anticipated impacts to waters of the United States in the FEIS. Identify the least environmentally damaging practicable alternative and commit to compensatory mitigation located as close to the project site as possible to preserve local habitat function.

[1] http://www.waterboards.ca.gov/water_issues/programs/tmdl/integrated2010.shtml

Vegetation

The DEIS states that USACE intends to pursue a vegetation variance from the standard vegetation guidelines set forth in the USACE Engineering Technical Letter 1110-2-583 to allow woody vegetation to be retained on the lower two thirds of the waterside slope of project levees, where appropriate (page 5-140). EPA strongly promotes the application for such a variance to preserve important habitat functions and water quality in the study area. The DEIS states that the design refinement phase of the project will include an evaluation of plans to identify further areas to minimize impacts to vegetation including reducing the project footprint, installing exclusion fencing, and worker training. The DEIS also identifies mitigation for impacts including on-site restoration, off-site restoration, and purchasing mitigation credits.

55-5 *Recommendations:* In the FEIS, indicate the status of the vegetation variance application. Include mitigation for temporal loss of vegetation and commit to implementing off-site mitigation or purchasing mitigation credits prior to the removal of vegetation.

Air Quality

As noted in the DEIS, the project is within the boundary of the San Joaquin Valley Air Basin, which is classified as extreme nonattainment for ozone and nonattainment for $PM_{2.5}$, and is subject to the EPA General Conformity Rule. The DEIS provides environmental commitments intended to reduce fugitive dust from construction, as required by the San Joaquin Valley Air Pollution Control District, and indicates that implementation of those commitments will reduce the impacts to $PM_{2.5}$ levels to less than significant. The DEIS further states that the action alternatives will be mitigated to reduce NOx emissions below the *de minimus* level of 10 tons per year by either requiring the use of Tier 3 equipment for all off-road vehicles or purchasing NOx emission offsets through a Verified Emission Reduction Agreement (page 5-93). Given the projected twelve year construction schedule for the project, the DEIS includes an expectation that construction fleets will become cleaner over time as vehicles are replaced with newer, lower emitting equipment.

Recommendations: If applicable, include a copy of an adopted and signed VERA in the FEIS and ROD. In addition to the measures required to meet applicable local, state, and federal requirements, EPA recommends committing to additional on-site mitigation measures, such as the following, to reduce NOx emissions before determining the need to fund off-site mitigation:

Mobile and Stationary Source Controls:

- Minimize use, trips, and unnecessary idling of heavy equipment.
- Maintain and tune engines per manufacturer's specifications to perform at EPA certification levels, where applicable, and to perform at verified standards applicable to retrofit technologies.
- 55-6 Employ periodic, unscheduled inspections to limit unnecessary idling and to ensure that construction equipment is properly maintained, tuned, and modified consistent with established specifications. The California Air Resources Board has a number of mobile source anti-idling requirements which should be employed (http://www.arb.ca.gov/msprog/truck-idling/truck-idling.htm).
- Prohibit any tampering with engines and require continuing adherence to manufacturer's recommendations.
- In general, commit to the best available emissions control technologies for project equipment:

- *On-Highway Vehicles* - On-highway vehicles should meet or exceed the US EPA exhaust emissions standards for model year 2010 and newer heavy-duty on-highway compression-ignition engines (e.g., long-haul trucks, refuse haulers, etc.).[2]
- *Nonroad Vehicles & Equipment* - Nonroad vehicles & equipment should meet or exceed the US EPA Tier 4 exhaust emissions standards for heavy-duty nonroad compression-ignition engines (e.g., construction equipment, nonroad trucks, etc.).[3]
- *Low Emission Equipment Exemptions* – The equipment specifications outlined above should be met unless: 1) a piece of specialized equipment is not available for purchase or lease within the United States; or 2) the relevant project contractor has been awarded funds to retrofit existing equipment, or purchase/lease new equipment, but the funds are not yet available.

Administrative controls:

- Prepare an inventory of all equipment prior to construction.
- Develop a construction traffic and parking management plan that minimizes traffic interference and maintains traffic flow.
- Identify where implementation of mitigation measures is rejected based on economic infeasibility.

Climate Change

On December 24, 2014, the Council on Environmental Quality released revised draft guidance for public comment that describes how federal departments and agencies should consider the effects of greenhouse gas emissions and climate change in their NEPA reviews. The revised draft guidance supersedes the draft greenhouse gas and climate change guidance released by CEQ in February 2010 and cited in the DEIS (pages 5-78 and 5-90). The new draft guidance explains that agencies should consider both the potential effects of a proposed action on climate change, as indicated by its estimated greenhouse gas emissions, and the implications of climate change for the environmental effects of a proposed action.

The DEIS reflects an understanding that climate change will increase flood risk to the study area. The DEIS states that the action alternatives were formulated using Engineer Regulation 1100-2-8162, Incorporating Sea Level Changes in Civil Works Programs,[4] curve two to account for sea level change over the design life of the project (page 3-27) and that further analysis of alternative rates of sea level change will be conducted during plan refinement. ER 1100-2-8162 acknowledges that sea level change can cause impacts to "shifts in the extent and distribution of wetlands and other coastal habitats, changes to groundwater levels, and alterations to salinity intrusion into estuaries and groundwater systems." It is clear that these models were used to determine the required levee heights and design features, but it is unclear if these models were used in informing the analysis of environmental impacts listed above for all action alternatives.

Beyond sea level change, the DEIS does not contain a discussion of potential climate change impacts to the watershed, including changes that could impact the timing and quantity of water flowing into the study area.

Recommendations: In the FEIS, update the Regulatory Framework section of the Air Quality and Climate Change section to reflect the new CEQ draft guidance.

55-7

[2] http://www.epa.gov/otaq/standards/heavy-duty/hdci-exhaust.htm
[3] http://www.epa.gov/otaq/standards/nonroad/nonroadci.htm
[4] http://www.publications.usace.army.mil/Portals/76/Publications/EngineerRegulations/ER_1100-2-8162.pdf

Indicate whether and, if so, how sea level change was incorporated into the analysis of environmental impacts. Add a discussion of how climate change would contribute to the cumulative effects of the proposed project.

Executive Orders 11988 and 13690

The DEIS provides an evaluation of the alternatives in relation to Executive Order 11988, 5-360 Floodplain Management. It states that the objective of this Executive Order is "to avoid, to the extent possible, any long and short-term adverse effects associated with the occupancy and modification of the base flood plain (1% annual event) and to avoid direct and indirect support of development in the base flood plain wherever there is a practicable alternative" (page 7-4). Alternative 7a was determined to be in compliance with the Executive Order because it would improve levees that protect existing populations and infrastructure in North and Central Stockton.

On January 30, President Obama issued Executive Order 13690 – Establishing a Federal Flood Risk Management Standard and a Process for Further Soliciting and Considering Stakeholder Input, which amends Executive Order 11988. Section 2(a) of EO 11988 requires agencies to "consider alternatives to avoid adverse effects and incompatible development in the floodplains." Section 6(c) of amended EO 11988 requires that, rather than basing the floodplain on the area subject to a one percent or greater chance of flooding in any given year, the floodplain be established using one of the following approaches:

(1) Unless an exception is made under paragraph (2), the floodplain shall be:
(i) the elevation and flood hazard area that result from using a climate-informed science approach that uses the best-available, actionable hydrologic and hydraulic data and methods that integrate current and future changes in flooding based on climate science. This approach will also include an emphasis on whether the action is a critical action as one of the factors to be considered when conducting the analysis;
(ii) the elevation and flood hazard area that result from using the freeboard value, reached by adding an additional 2 feet to the base flood elevation for non-critical actions and by adding an additional 3 feet to the base flood elevation for critical actions;
(iii) the area subject to flooding by the 0.2 percent annual chance flood; or
(iv) the elevation and flood hazard area that result from using any other method identified in an update to the Federal Flood Risk Management Standards.

We recognize that EO 13690 was signed only a few weeks before the DEIS was published, and that implementation guidelines may not be finalized until after the FEIS is published or Record of Decision is signed. The DEIS, therefore, does not take the new standards into account or discuss their potential applicability to various flood risk management measures. It is unclear whether or how implementation of the forthcoming guidelines would alter the alternative selection or design process for the selected alternative. It is also unclear how the costs and benefits of the proposed project could change based on the new floodplain criteria.

55-8 ***Recommendation:*** Address EO 13690 in the FEIS, and discuss its potential implications over the twelve year design and implementation horizon for the project, including how project costs and benefit-cost analyses could be affected.

Reuse of Dredged Material

The DEIS estimates that 1.8 million cubic yards of borrow material could be required to construct the entire project (page 4-26) and states that sufficient quantities of materials are available within 25 miles of the project. The document does not identify specific borrow sites, other than to say that fill material would be obtained from local construction borrow areas and commercial sources. Reusing dredged material is a shared goal of USACE and EPA.[5] Ongoing USACE projects generate the vast majority of dredged material in the Delta, and past USACE dredging accounts for most of the stockpiles of previously-dredged material around the Delta. This project represents an opportunity to access and reuse stockpiled dredged material.

Recommendations: In the FEIS, evaluate the suitability of existing USACE dredged material stockpiles for construction of the project. Commit to maximize the use of already stockpiled
55-9 dredged material.

Alternatives for Erosion Control

The DEIS includes rock slope protection (also known as riprap) for all of the alternatives, and states that other erosion methodologies may be explored during the Preconstruction, Engineering, and Design phase (page 4-7). In 2004, the U.S. Fish and Wildlife Service published an updated report, *Impacts of Riprapping to Aquatic Organisms and River Functioning, Lower Sacramento River, California*, that documents the negative effects of rock slope protection. Possible alternatives to riprapping are suggested in the FEMA brochure *Engineering with Nature: Alternative Techniques to Riprap Bank Stabilization.*

Recommendation: Explore additional alternative methods of erosion control in the FEIS, including bio-engineering, hydro-seeding, controlled planting, and construction of engineered
55-10 logjams. Include a discussion of which alternative methods are compatible with USACE vegetation policy and meet project needs.

Consultation and Coordination with Tribal Governments

Executive Order 13175, Consultation and Coordination with Indian Tribal Governments (November 6, 2000), directs federal agencies to establish tribal consultation and collaboration processes for the development of federal policies that have tribal implications, and is intended to strengthen the United States government-to-government relationships with Indian tribes. The DEIS describes USACE efforts with regard to tribal consultation and states that the California Valley Miwok Tribe requested Government to Government consultation and that the Nototomne/Northern Valley Yokuts requested additional information (page 5-354). Neither tribe is included on the list of recipients of the DEIS (page 10-1). The DEIS states that copies of the correspondence related to tribal consultation and the draft Programmatic Agreement can be found in Appendix B.3; however, EPA was unable to locate the documents.

Recommendation: In the FEIS, discuss the status of consultation with tribes affected by the
55-11 project and the impacts and mitigation measures identified through that consultation. Include the tribes in the distribution list of the FEIS and Record of Decision.

[5]National Dredging Team Charter:
water.epa.gov/type/oceb/oceandumping/dredgedmaterial/upload/2003_12_05_oceans_ndt_publications_2003_charter.pdf

STATE OF CALIFORNIA
Governor's Office of Planning and Research
State Clearinghouse and Planning Unit

Edmund G. Brown Jr.
Governor

Ken Alex
Director

April 14, 2015

Tyler Stalker
San Joaquin County Area Flood Control Agency
US Army Corps of Engineers
1325 J Street
Sacramento, CA 95814

Subject: Lower San Joaquin River Feasibility Study
SCH#: 2010012027

Dear Tyler Stalker:

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 13, 2015, 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."

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,

Scott Morgan

Scott Morgan
Director, State Clearinghouse

Enclosures
cc: Resources Agency

Document Details Report
State Clearinghouse Data Base

SCH# 2010012027
Project Title Lower San Joaquin River Feasibility Study
Lead Agency San Joaquin County Area Flood Control Agency

Type JD Joint Document

Description The Corps and its non-Federal sponsors propose to improve flood risk management to North and Central Stockton by repairing and enhancing the levees that surround the city, and by constructing and operating closure structures on Fourteenmile Slough and Smith Canal. The overall study area as defined in the Study authorization includes the mainstem of the San Joaquin River from the Mariposa Bypass downstream to the city of Stockton. The study area also includes the distributary channel of the San Joaquin River in the southernmost reaches of the Delta: Paradise Cut and Old River as far north as Tracy Boulevard and Middle River as far north as Victoria Canal. Based on availability of potential non-Federal sponsors the refined study area focused on approximately 305 sf encompassing incorporated areas of Stockton, Lathrop, and Manteca as well as unincorporated portions of San Joaquin County. The draft FR/EIS/EIS presents the draft findings of the Feasibility Study, which formulates and evaluates the benefits, costs, and environmental effects of alternative plans to improve flood risk management in and near the cities of Stockton, Manteca, and Lathrop in San Joaquin Valley.

Lead Agency Contact

Name Tyler Stalker
Agency San Joaquin County Area Flood Control Agency
Phone 916 557 5100 ***Fax***
email
Address US Army Corps of Engineers
1325 J Street
City Sacramento ***State*** CA ***Zip*** 95814

Project Location

County Sacramento, San Joaquin
City Stockton, Manteca, Lathrop
Region
Lat / Long
Cross Streets
Parcel No.
Township ***Range*** ***Section*** ***Base***

Proximity to:

Highways Hwy 99, I-5
Airports
Railways
Waterways San Joaquin River
Schools
Land Use Various

Project Issues Agricultural Land; Archaeologic-Historic; Biological Resources; Drainage/Absorption; Economics/Jobs; Fiscal Impacts; Flood Plain/Flooding; Geologic/Seismic; Minerals; Noise; Public Services; Recreation/Parks; Soil Erosion/Compaction/Grading; Traffic/Circulation; Vegetation; Water Quality; Water Supply; Growth Inducing; Landuse; Cumulative Effects; Aesthetic/Visual; Air Quality; Population/Housing Balance; Schools/Universities; Solid Waste; Toxic/Hazardous; Wetland/Riparian

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Reviewing Agencies Resources Agency; Department of Fish and Wildlife, Region 2; Department of Parks and Recreation; Central Valley Flood Protection Board; Department of Water Resources; California Highway Patrol; Caltrans, District 10; Air Resources Board; State Water Resources Control Board, Division of Water Rights; Regional Water Quality Control Bd., Region 5 (Sacramento); Native American Heritage Commission

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

Document Details Report
State Clearinghouse Data Base

Date Received 02/26/2015 *Start of Review* 02/27/2015 *End of Review* 04/13/2015

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CALIFORNIA
Water Boards

EDMUND G. BROWN JR.
GOVERNOR

MATTHEW RODRIQUEZ
SECRETARY FOR
ENVIRONMENTAL PROTECTION

Central Valley Regional Water Quality Control Board

1 April 2015

RECEIVED
APR 08 2015
STATE CLEARING HOUSE

Juan Neira
San Joaquin County Area Flood Control Agency
22 East Weber Avenue, Suite 301
Stockton, CA 95202

CERTIFIED MAIL
7014 2120 0001 3978 4887

COMMENTS TO REQUEST FOR REVIEW FOR THE DRAFT ENVIRONMENTAL IMPACT REPORT, LOWER SAN JOAQUIN RIVER FEASIBILITY STUDY PROJECT, SCH# 2010012027, SAN JOAQUIN COUNTY

Pursuant to the State Clearinghouse's 27 February 2015 request, the Central Valley Regional Water Quality Control Board (Central Valley Water Board) has reviewed the *Request for Review for the Draft Environment Impact Report* for the Lower San Joaquin River Feasibility Project, located in San Joaquin County.

Our agency is delegated with the responsibility of protecting the quality of surface and groundwaters of the state; therefore our comments will address concerns surrounding those issues.

Construction Storm Water General Permit

Dischargers whose project disturb one or more acres of soil or where projects disturb less than one acre but are part of a larger common plan of development that in total disturbs one or more acres, are required to obtain coverage under the General Permit for Storm Water Discharges Associated with Construction Activities (Construction General Permit), Construction General Permit Order No. 2009-009-DWQ. Construction activity subject to this permit includes clearing, grading, grubbing, disturbances to the ground, such as stockpiling, or excavation, but does not include regular maintenance activities performed to restore the original line, grade, or capacity of the facility. The Construction General Permit requires the development and implementation of a Storm Water Pollution Prevention Plan (SWPPP).

For more information on the Construction General Permit, visit the State Water Resources Control Board website at:
http://www.waterboards.ca.gov/water_issues/programs/stormwater/constpermits.shtml.

Clean Water Act Section 401 Permit – Water Quality Certification

If an USACOE permit (e.g., Non-Reporting Nationwide Permit, Nationwide Permit, Letter of Permission, Individual Permit, Regional General Permit, Programmatic General Permit), or any other federal permit (e.g., Section 9 from the United States Coast Guard), is required for this project due to the disturbance of waters of the United States (such as streams and wetlands), then a Water Quality Certification must be obtained from the Central Valley Water Board prior to initiation of project activities. There are no waivers for 401 Water Quality Certifications.

Waste Discharge Requirements

If USACOE determines that only non-jurisdictional waters of the State (i.e., "non-federal" waters of the State) are present in the proposed project area, the proposed project will require a Waste Discharge Requirement (WDR) permit to be issued by Central Valley Water Board. Under the California Porter-Cologne Water Quality Control Act, discharges to all waters of the State, including all wetlands and other waters of the State including, but not limited to, isolated wetlands, are subject to State regulation.

For more information on the Water Quality Certification and WDR processes, visit the Central Valley Water Board website at: http://www.waterboards.ca.gov/centralvalley/help/business_help/permit2.shtml.

Regulatory Compliance for Commercially Irrigated Agriculture

If the property will be used for commercial irrigated agricultural, the discharger will be required to obtain regulatory coverage under the Irrigated Lands Regulatory Program. There are two options to comply:

1. **Obtain Coverage Under a Coalition Group.** Join the local Coalition Group that supports land owners with the implementation of the Irrigated Lands Regulatory Program. The Coalition Group conducts water quality monitoring and reporting to the Central Valley Water Board on behalf of its growers. The Coalition Groups charge an annual membership fee, which varies by Coalition Group. To find the Coalition Group in your area, visit the Central Valley Water Board's website at: http://www.waterboards.ca.gov/centralvalley/water_issues/irrigated_lands/app_approval/index.shtml; or contact water board staff at (916) 464-4611 or via email at IrrLands@waterboards.ca.gov.

2. **Obtain Coverage Under the General Waste Discharge Requirements for Individual Growers, General Order R5-2013-0100**. Dischargers not participating in a third-party group (Coalition) are regulated individually. Depending on the specific site conditions, growers may be required to monitor runoff from their property, install monitoring wells, and submit a notice of intent, farm plan, and other action plans regarding their actions to comply with their General Order. Yearly costs would include State administrative fees (for example, annual fees for farm sizes from 10-100 acres are currently $1,084 + $6.70/Acre); the cost to prepare annual monitoring reports; and water quality monitoring costs. To enroll as an Individual Discharger under the Irrigated Lands Regulatory

April 8, 2015

U.S. Army Corps of Engineers
Sacramento District
ATTENTION: Ms. Tanis Toland
1325 J Street
Sacramento, CA 95814-2922

SUBJECT: San Joaquin River Basin, Lower San Joaquin River, CA "DRAFT" Integrated Interim Feasibility Report/ Environmental Impact Statement/Environmental Impact Report

Ms. Toland

As one of many residents and landowners in the area of south Manteca, located in the area of RD17 levee, I have many concerns about what the City of Manteca is proposing in relation to the Proposed levee extension. There are many of us who have homes, and small farms as well as those with orchards, vineyards, dairies, And hog farms.

In reading your February 2015 report, I have concerns about the lasting and irreversible out-come to the loss of our rich farm-land and water supply. The end result being, city and county residents, will be affected by this irreversible loss.

The city of Manteca is proposing a massive expansion of the existing RD17 levee beyond the scope of what is needed. Perhaps the City should not have allowed the building of homes in the flood plain to begin with. I understand how it may have become necessary for the city to protect these existing homes but not to the extent the city of Manteca is proposing. It seems as though the City is taking advantage of an opportunity to expand its' borders. Perhaps, the City of Manteca should consider placing a hold on building in those areas known to be in the flood plain. We are in the middle of a terrible drought.

Our concerns are for the effects slurry walls, which will certainly be put in place to protect the levee from seepage, will do to our environment.

1. Wells (**pages 5-53, 5-54, 5-55)
2. Ground water depth (**5-54, 5-55)
3. Ruin crops due to the likelihood of higher ground water compacting roots
4. Dairy and Pig Farms – affects due to higher flood water contacting those facilities
5. No aquifer recharge (** pages 5-53, 5-54)
6. Dry aquifer ultimately leads to subsidence (**5-17)
7. Flood waters will rise in areas where it was a borderline incident in the past due to water displacement in areas due to levee construction in areas previously flooded

Thanking you in advance for giving us the opportunity to respond to the " Integrated Interim Feasibility Report/Environmental Impact Statement/Environmental Impact Report". I would like to urge you to oppose this massive expansion of the City of Manteca's proposed levee extension.

Respectfully, Rex D. Robertson & Lil Roberts

Name [redacted]
Address

**see San Joaquin River Basin Lower San Joaquin River, CA DRAFT Integrated Interim Feasibility Report/Environmental Impact Statement/Environment Impact Report

April 8, 2015

U.S. Army Corps of Engineers
Sacramento District
ATTENTION: Ms. Tanis Toland
1325 J Street
Sacramento, CA 95814-2922

SUBJECT: San Joaquin River Basin, Lower San Joaquin River, CA "DRAFT" Integrated Interim Feasibility Report/ Environmental Impact Statement/Environmental Impact Report

Ms. Toland

As one of many residents and landowners in the area of south Manteca, located in the area of RD17 levee, I have many concerns about what the City of Manteca is proposing in relation to the Proposed levee extension. There are many of us who have homes, and small farms as well as those with orchards, vineyards, dairies, And hog farms.

In reading your February 2015 report, I have concerns about the lasting and irreversible out-come to the loss of our rich farm-land and water supply. The end result being, city and county residents, will be affected by this irreversible loss.

The city of Manteca is proposing a massive expansion of the existing RD17 levee beyond the scope of what is needed. Perhaps the City should not have allowed the building of homes in the flood plain to begin with. I understand how it may have become necessary for the city to protect these existing homes but not to the extent the city of Manteca is proposing. It seems as though the City is taking advantage of an opportunity to expand its' borders. Perhaps, the City of Manteca should consider placing a hold on building in those areas known to be in the flood plain. We are in the middle of a terrible drought.

Our concerns are for the effects slurry walls, which will certainly be put in place to protect the levee from seepage, will do to our environment.

1. Wells (**pages 5-53, 5-54, 5-55)
2. Ground water depth (**5-54, 5-55)
3. Ruin crops due to the likelihood of higher ground water compacting roots
4. Dairy and Pig Farms – affects due to higher flood water contacting those facilities
5. No aquifer recharge (** pages 5-53, 5-54)
6. Dry aquifer ultimately leads to subsidence (**5-17)
7. Flood waters will rise in areas where it was a borderline incident in the past due to water displacement in areas due to levee construction in areas previously flooded

Thanking you in advance for giving us the opportunity to respond to the " Integrated Interim Feasibility Report/Environmental Impact Statement/Environmental Impact Report". I would like to urge you to oppose this massive expansion of the City of Manteca's proposed levee extension.

Respectfully,

Name Rebecca Hunt [redacted]
Address [redacted]

**see San Joaquin River Basin Lower San Joaquin River, CA DRAFT Integrated Interim Feasibility Report/Environmental Impact Statement/Environment Impact Report

April 8, 2015

U.S. Army Corps of Engineers
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Ms. Toland

As a resident of the City of Manteca, I am concerned about what the City of Manteca is proposing in relationship to the proposed levee extension in the area of the RD17 levee. Even though I do not live in the immediate area, I still have some concerns.

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Respectfully,

Name Vern Gebhardt
Address [redacted]

**see San Joaquin River Basin Lower San Joaquin River, CA DRAFT Integrated Interim Feasibility Report/Environmental Impact Statement/Environment Impact Report

April 8, 2015

U.S. Army Corps of Engineers
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Respectfully,

Name JOHN PATTON
Address [redacted]

**see San Joaquin River Basin Lower San Joaquin River, CA DRAFT Integrated Interim Feasibility Report/Environmental Impact Statement/Environment Impact Report

ENVIRONMENTAL ADDENDUM G

FARMLAND CONVERSION IMPACT RATING

LOWER SAN JOAQUIN FEASIBILITY STUDY

U.S. DEPARTMENT OF AGRICULTURE
Natural Resources Conservation Service

NRCS-CPA-106
(Rev. 1-91)

FARMLAND CONVERSION IMPACT RATING FOR CORRIDOR TYPE PROJECTS

PART I *(To be completed by Federal Agency)*		3. Date of Land Evaluation Request 12/10/15	4. Sheet 1 of ___
1. Name of Project **Lower San Joaquin River Feasibility Report**		5. Federal Agency Involved **U.S. Army Corps of Engineers**	
2. Type of Project **Civil Works Flood Risk Management Project**		6. County and State **San Joaquin County, CA**	
PART II *(To be completed by NRCS)*		1. Date Request Received by NRCS 12-16-2015	2. Person Completing Form Ken Oster
3. Does the corridor contain prime, unique statewide or local important farmland? (If no, the FPPA does not apply - Do not complete additional parts of this form).		YES ☑ NO ☐	4. Acres Irrigated 485,402 | Average Farm Size 220
5. Major Crop(s) Almonds, Walnuts, Grapes	6. Farmable Land in Government Jurisdiction Acres: 517,918 % 56.8		7. Amount of Farmland As Defined in FPPA Acres: 614,129 % 67.3
8. Name Of Land Evaluation System Used Storie Index	9. Name of Local Site Assessment System None		10. Date Land Evaluation Returned by NRCS 1-15-2016

PART III *(To be completed by Federal Agency)*		Alternative Corridor For Segment Corridor A	Corridor B	Corridor C	Corridor D
A. Total Acres To Be Converted Directly		28			
B. Total Acres To Be Converted Indirectly, Or To Receive Services		-			
C. Total Acres In Corridor		100			
PART IV *(To be completed by NRCS)* **Land Evaluation Information**					
A. Total Acres Prime And Unique Farmland		14			
B. Total Acres Statewide And Local Important Farmland		0			
C. Percentage Of Farmland in County Or Local Govt. Unit To Be Converted		0.003			
D. Percentage Of Farmland in Govt. Jurisdiction With Same Or Higher Relative Value		14.21			
PART V *(To be completed by NRCS)* **Land Evaluation Information Criterion Relative value of Farmland to Be Serviced or Converted (Scale of 0 - 100 Points)**		82			
PART VI *(To be completed by Federal Agency)* **Corridor Assessment Criteria (These criteria are explained in 7 CFR 658.5(c))**	Maximum Points				
1. Area in Nonurban Use	15	6			
2. Perimeter in Nonurban Use	10	4			
3. Percent Of Corridor Being Farmed	20	5			
4. Protection Provided By State And Local Government	20	0			
5. Size of Present Farm Unit Compared To Average	10	0			
6. Creation Of Nonfarmable Farmland	25	0			
7. Availability Of Farm Support Services	5	1			
8. On-Farm Investments	20	2			
9. Effects Of Conversion On Farm Support Services	25	0			
10. Compatibility With Existing Agricultural Use	10	1			
TOTAL CORRIDOR ASSESSMENT POINTS	160	0 18	0	0	0
PART VII *(To be completed by Federal Agency)*					
Relative Value Of Farmland (From Part V)	100	0 82	0	0	0
Total Corridor Assessment (From Part VI above or a local site assessment)	160	0 18	0	0	0
TOTAL POINTS *(Total of above 2 lines)*	260	0 100	0	0	0

1. Corridor Selected:	2. Total Acres of Farmlands to be Converted by Project:	3. Date Of Selection:	4. Was A Local Site Assessment Used?
A	14	12/10/15	YES ☐ NO ☑

5. Reason For Selection:

Signature of Person Completing this Part: Victoria Hermeron DATE 2/24/16

NOTE: Complete a form for each segment with more than one Alternate Corridor

ENVIRONMENTAL ADDENDUM H

BIOLOGICAL ASSESSMENT

LOWER SAN JOAQUIN FEASIBILITY STUDY

Biological Assessment
Terrestrial & Aquatic Species

San Joaquin River Basin
Lower San Joaquin River, CA
Interim Feasibility Study

November 2015

U.S. Army Corps of Engineers
Sacramento District

Official Version

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Acronyms and Abbreviations

BA	biological assessment
BMPs	best management practices
BSSCP	bentonite slurry spill contingency plan
CDFG	California Department of Fish and Game
CDFW	California Department of Fish and Wildlife
CEQA	California Environmental Quality Act
CFR	Code of Federal Regulations
CHP	California Highway Patrol
CNDDB	California Natural Diversity Database
CNPS	California Native Plant Society
CVFPB	Central Valley Flood Protection Board
CVFPP	Central Valley Flood Protection Plan
dbh	diameter at breast height
DPS	distinct population segment
DSM	deep soil mixing
DWR	California Department of Water Resources
EFH	essential fish habitat
EIS/EIR	Environmental Impact Statement/Environmental Impact Report
EPA	U.S. Environmental Protection Agency
ESA	Federal Endangered Species Act
ESU	evolutionary significant unit
ETL	Engineer Technical Letter
FRM	flood risk management
IWM	instream woody material
lf	linear feet
LSJRFS	Lower San Joaquin River Feasibility Study
LSJRTP	Lower San Joaquin River and Tributaries Project
MBTA	Migratory Bird Treaty Act
MMP	Mitigation and Monitoring Plan
MSA	Magnuson-Stevens Fishery Conservation and Management Act of 1997
NEPA	National Environmental Policy Act
NMFS	National Marine Fisheries Service
NPDES	National Pollutant Discharge Elimination System
NTU	nephelometric turbidity unit
O&M	operations and maintenance
OHWM	ordinary high water mark
PL	public law
psi	pounds per square inch
RD	reclamation district
RM	river mile
RWQCB	Regional Water Quality Control Board
SAM	Standard Assessment Methodology
SB	Soil-bentonite
SCS	U.S. Soil Conservation Service
SPCCP	spill prevention, control, and counter-measure plan
SRA	shaded riverine aquatic
SWPPP	stormwater pollution protection plan
Corps	U.S. Army Corps of Engineers
USC	United States Code

USFWS	U.S. Fish and Wildlife Service
VELB	valley elderberry longhorn beetle
VVR	vegetation variance request
WRDA	Water Resources Development Act
WRI	weighted species response index

San Joaquin River Basin
Lower San Joaquin River Interim Feasibility Study
Biological Assessment

1.0 INTRODUCTION

The U.S. Army Corps of Engineers, Sacramento District, (Corps) is requesting consultation with the U.S. Fish and Wildlife Service (USFWS) and with the National Marine Fisheries Service (NMFS) under Section 7 of the Endangered Species Act (ESA) for potential effects of the Lower San Joaquin River Feasibility Study (LSJRFS) Recommended Plan on Federally-listed species and their designated critical habitat. The Corps is also requesting to consult with the NMFS on essential fish habitat (EFH) under the Magnuson-Stevens Fishery Conservation and Management Act (PL 94-265). The species, critical habitat, and EFH that are the subject of this consultation are identified in Table 1. This biological assessment (BA) describes the proposed action, which is the Recommended Plan, and provides the Corps' evaluation of the potential effects of the proposed action on Federally-protected resources. The BA also identifies conservation measures to avoid, reduce, or off-set through compensation, the potential effects of the proposed action. The actions covered in this BA are associated with flood risk management measures proposed to be implemented in the LSJRFS project study area (Figure 1). The project area and the proposed flood risk management measures, are shown in Figure 2. This BA was prepared in accordance with the requirements of Section 7 and the Corps' Engineering Regulation 1105-2-100 (Corps 2000a).

Section 7 of the ESA requires Federal agencies to conserve listed species and their critical habitat, and to consult with USFWS and NMFS (the Services) to ensure that the actions they fund, authorize, or perform do not jeopardize the existence of any listed species or result in the destruction or adverse modification of their designated critical habitat. Section 7 also requires that agencies with regulatory authority over listed species issue biological opinions that evaluate the direct and indirect effects of Federal actions, and actions that are interrelated with or interdependent to the Federal action, to determine if they may appreciably reduce the listed species' likelihood of surviving or recovering in the wild by reducing their productivity, numbers, or distribution. The actions covered in this BA are associated with future levee modifications proposed under the LSJRFS.

The Magnuson-Stevens Fishery Conservation and Management Act of 1976 (MSA), as amended, governs the conservation and management of commercially harvested ocean fisheries. The purpose of the Act is to take immediate action to conserve, protect, and manage U.S. coastal fishery resources, anadromous species, and EFH. EFH is the aquatic habitat (water and substrate) that is necessary for fish to spawn, breed, feed, or mature, and that allows production levels needed to: (1) support a long-term, sustainable commercial fishery, and (2) contribute to a healthy ecosystem (NMFS 1997). Most, if not all, of the LSJR FS study area is designated s EFH for Pacific salmon under Section 305(b)(2) of the MSA.

Species to be addressed in this BA include:

- Fish species with designated EFH under the MSA
- Listed species under the Federal ESA
- Species with designated critical habitat under the ESA

1.1 Project Background

The Corps and its non-Federal sponsors, the San Joaquin Area Flood Control Agency (SJAFCA) and the State of California Central Valley Flood Protection Board, represented by the California Department of Water Resources (DWR), are conducting the Lower San Joaquin River Interim Feasibility Study.

The purpose of the SJRFS is to investigate and determine the extent of Federal interest in a range of alternative plans designed to reduce the risk of flooding in the cities of Stockton, Lathrop, Manteca, and surrounding urbanizing areas. These areas have experienced multiple flooding events since records have been maintained. The existing levee system within the study area protects over 71,000 acres of mixed-use land with a current population estimated at 264,000 residents and an estimated $21 billion in damageable property.

The study area is has very little topographic relief, resulting in potential flooding of areas far from water courses. Given the flat topography, the study area is prone to fairly deep flooding as demonstrated for a 0.2% Annual Chance of Exceedance (500 year). The San Joaquin River has flow monitoring data from at least 1930 at the Vernalis gage site. The flow data shows several significant flow events, the most recent in 1997. The study area has a history of flooding events, with major events occurring three times since the 1950's. The 1955 event had the highest flows recorded on the Calaveras River at Bellota, and approximately 1,500 acres of Stockton were inundated to depths of six feet for as long as eight days. The 1958 event inundated approximately 8,500 acres between Bellota and the Diverting Canal with flood waters up to two feet deep, and inundation durations from two to ten days. The 1997 event resulted in the evacuation of the Weston Ranch area of Stockton at the north end of Reclamation District (RD) 17. While the 1997 event did not directly damage areas of Stockton, Lathrop, or Manteca, there were approximately 1,842 residences and businesses affected in San Joaquin and Stanislaus Counties. There were also significant flood-fighting efforts conducted during the 1997 event in RDs 404 and 17. Between the two RDs, there were 37 sites flood-fought. Damages in San Joaquin County for the 1997 event were estimated to be near $80 million.

During development of computer models of the study area, potential measures were evaluated individually and in combination to understand how the existing flood management system functions and how it would respond to changes. The evaluations led to several important findings about the flood management system. Some of these findings included:

- The system cannot safely convey the flows that it was formerly considered capable of accommodating.
- If levee reliability were improved system-wide, substantial increases in flood storage capacity would be necessary to avoid transferring increased flood risks to downstream areas.
- A comprehensive solution to reduce flood damages and restore degraded ecosystems will require a combination of measures that increase conveyance capacity, increase flood storage, and improve floodplain management.

1.2 Authority

The general authority for flood control investigations in the San Joaquin River Basin arises under the Flood Control Act of 1936 (Public Law [PL] 74-738), Sections 2 and 6 and amended by the Flood Control Act of 1938 (PL 75-761). The Flood Control Act of 1936, Section 6 permits further reports to be authorized by congressional resolutions. Further studies of this river system were directed in the 8 May 1964 resolution adopted by the Committee on Public Works of the House of Representatives. The resolution reads:

> "*Resolved by the Committee on Public Works of the House of Representatives, United States, that the Board of Engineers for Rivers and Harbors is hereby requested to review the reports on the Sacramento-San Joaquin Basin Streams, California, published in House Document No. 367, 81st Congress, 1st session, and other reports, with a view to determine whether any modifications to the recommendations contained therein are advisable at this time, with particular reference to further coordinated development of the water resources in the San Joaquin River Basin, California*."

The LSJRFS is being accomplished in accordance with the Section 905(b) Analysis (Water Resources Development Act (WRDA) 1986) dated 23 September 2004. The Section 905(b) Analysis was approved by the Commander, SPD on 10 June 2005. The Section 905(b) Analysis was prepared with funds identified in House Report 108-357 (Conference Report to accompany H.R. 2745 for the Energy and Water Development Appropriations Act of 2004) for use under the Sacramento-San Joaquin River Basins Comprehensive Study for a reconnaissance study to evaluate environmental restoration, flood protection, and related purposes for the Lower San Joaquin River. House Report 105-190, which accompanied the Energy and Water Development Appropriations Act of 1998 (PL 105-62) authorized the Sacramento and San Joaquin River Basins Comprehensive Study (Comprehensive Study).

The Section 905(b) Analysis determined that there was Federal interest in pursuing feasibility level investigations for potential flood risk reduction and ecosystem restoration projects in the Lower San Joaquin River area. This study has been focused on flood risk reduction through additional scoping and coordination with the non-Federal sponsors, resource agencies and local stakeholders.

This study will only partially address the Sacramento – San Joaquin Basin Streams, California Comprehensive Study authority. Therefore, the LSJRFS will be called an “Interim Feasibility Report” which indicates that the study is addressing the flood risk issues of a specific area within the authority, rather than the entire area authorized for study.

1.3 Species, Critical Habitat, and EFH Requiring Consultation

An official list of species with the potential to occur in the vicinity of the LSJR FS project area and Federally listed as threatened, endangered, and proposed threatened or endangered was obtained from the Sacramento USFWS website for San Joaquin County and for the following quads: Stockton West, Stockton East, Lodi South, Waterloo, Lathrop, Manteca (USFWS 2014, 2015). The lists are provided in Appendix A. The following Federally endangered and threatened species were included on the USFWS species list and were considered for inclusion in this BA because of possible suitable habitat in the project area.

<u>Invertebrates</u>

- Vernal pool fairy shrimp (*Branchinecta lynchi*) – threatened
- Valley Elderberry longhorn beetle (VELB) (*Desmocerus californicus dimorphus*) – threatened
- Vernal pool tadpole shrimp (*Lepidurus packardi*) – endangered

<u>Fish</u>

- Green sturgeon (*Acipenser medirostris*) – threatened
- Delta smelt (*Hypomesus transpacificus*) – threatened
- Central Valley steelhead (*Oncorhynchus mykiss*) – threatened
- Central Valley spring-run Chinook salmon (*Oncorhynchus tshawytscha*) – threatened. Considered but not included due to extirpation on the San Joaquin River.
- Winter-run chinook salmon (*Oncorhynchus tshawytscah*) – endangered. Considered but not included due to only potential presence lower down at the confluence of the San Joaquin and Sacramento Rivers. No presence expected in the action area.

<u>Amphibians</u>

- California tiger salamander, central population (*Ambystoma californiense*) - threatened
- California red-legged frog (*Rana draytonii*) – threatened

<u>Reptiles</u>

- Giant garter snake (GGS) (*Thamnophis gigas*) – threatened

Birds

- Western yellow-billed cuckoo (*Coccyzus americanus occidentalis*) - threatened

Mammals

- Riparian brush rabbit (*Thamnophis gigas*) – endangered

Plants

- Palmate-bracted bird's-beak (*Cordylanthus palmatus*) – endangered
- Owl's-clover (*Castilleja campestris ssp. succulent*) - threatened

Critical Habitat

- Delta smelt critical habitat
- Central Valley steelhead critical habitat
- Southern distinct population segment (sDPS) green sturgeon critical habitat

On-going coordination with the Services will occur as the project progresses to the preliminary engineering design phase (PED) to ensure compliance with Section 7. The Corps would coordinate potential design refinements with the Services to conserve species and designated critical habitat by avoiding, minimizing, and compensating to off-set effects on listed species and reinitiate consultation if necessary. The action area includes the protected species, critical habitat, and EFH listed in Table 1.

Of the 15 Federally listed species considered for inclusion in this BA, the 5 species (and their critical habitats) listed in Table 1 have the potential to occur in the Action Area and may be affected by the proposed project; therefore, these species are the subject of this BA. In addition, Sacramento River Fall/Late Fall run Chinook salmon ESU may be present.

Table 1: Federally Protected Species, Critical Habitat, and EFH Addressed in this Biological Assessment Analysis

Common Name	Scientific Name	Federal Status	Critical Habitat in Action Area?	EFH in Action Area?
Valley elderberry longhorn beetle (VELB)	*Desmocerus californicus dimorphus*	T	Y	--
Central Valley steelhead DPS	*Oncorhynchus mykiss*	T	Y	--
Delta smelt	*Hypomesus transpacificus*	T	Y	--
Green sturgeon southern DPS	*Acipenser medirostris*	T	Y	--
Giant garter snake (GGS)	*Thamnophis gigas*	T	--	--
Sacramento River Fall/Late Fall run Chinook salmon ESU	*Oncorhynchus tshawytscha*	**MSA**	N	Y*

* In the project area EFH has been designated only for Pacific Salmon, which includes these species.

Notes:
ESU = Evolutionarily Significant Unit
DPS = Distinct Population Segment
MSA = Magnuson-Stevens Fishery Conservation and Management Act.
T = ESA-listed as Threatened

1.3.1 Other Species Considered but Eliminated from Further Evaluation

The LSJR FS's action area does not contain suitable habitat (i.e., vernal or seasonal pools or swales) for conservancy fairy shrimp, vernal pool fairy shrimp, vernal pool tadpole shrimp. Therefore, it has been determined that the proposed action would have no effect on any of these species, and no further evaluation or consultation on these species is needed (50 Code of Federal Regulations[CFR] 402.12).

1.4 Consultation to Date

The Corps has been informally consulting with the USFWS and NMFS during the feasibility study. Meetings and phone calls with the Corps and NFMS have taken place to discuss the project and the potential species affected. On June, 24, 2014, the USFWS submitted a Draft Fish and Wildlife Coordination Act Report. Representatives of the LSJRFS team met with members of the USFWS and NMFS to discuss the project on July 22. 2014. The study area includes the protected species and critical habitat listed in Table 1. An official USFWS species list was generated on February 05, 2015. See Appendix A for the species quad lists.

If the project is authorized and funded, it would move into the PED phase. During PED coordination with the resource agencies would continue in order to ensure that the project remains in compliance with Section 7. The Corps would coordinate potential design refinements with the Services to avoid, minimize, and off-set any adverse effects on listed species. Formal Section 7 consultation would be reinitiated, if necessary.

1.4.1 Consultation Approach

The LSJR FS project is at a feasibility level of design. This BA analyzes the reasonable and foreseeable effects on listed species using a conservative project footprint based on information known at the time of this assessment. The Corps will consult on Alternative 7a which is the Recommended Plan. As the project moves into further design, we believe design refinements will reduce the footprint and reduce the effects on listed species. Continued coordination with resource agencies throughout the duration of this project will assist in guiding the Corps towards designing and constructing an effective and environmentally responsible project. This will further minimize adverse effects to listed species. This approach will allow the USFWS and NMFS to conduct the jeopardy analysis and to determine the level of take in an Incidental Take Statement. Coordination with the resource agencies will continue into the design phase to obtain input which can help to conserve listed species through avoidance, minimization, and compensation. This future coordination would attempt to reduce any compensatory mitigation required for the project and would also determine if additional consultation is needed for the project.

1.4.2 Consultation History

- September 21, 2015 – Meeting with USFWS to discuss project and conservation measures.
- September 17, 2015 – Meeting with NMFS to discuss project and conservation measures.
- July 30, 2015 – Phone discussion with NMFS biologist to discuss potential conservation measures
- July 30, 2015 - Phone discussions with USFWS biologist to discuss potential conservation measures
- June 11, 2015 – USFWS correspondence requesting additional information from the Corps to support consultation
- April 2, 2015 March 31, 2015 – The Corps and NMFS met to discuss their letter advising the Corps of additional information needed to support consultation.
- March 31, 2015 – NMFS correspondence requesting additional information from the Corps to support consultation.
- February 2015 – The Corps transmitted the BA to USFWS and to NMFS and requested to initiate formal Section 7 consultation with USFWS and to informally consult with NMFS.
- February 2015 – an updated species list for San Joaquin County and pertinent quads was obtained from the USFWS website.
- July 22, 2014 – The Corps, USFWS, and NMFS met to discuss the study status, the project alternatives, draft impact assessment, and approaches to mitigation and conservation measures.
- June 2014 – USFWS provided their draft FWCAR
- 2014 – Species list
- May 29-30, 2013 – USFWS, DWR, and the Corps environmental staff participated in a field tour of the project area
- 2013 – Species list

2.0 ACTION AREA

The action area refers to the areas directly or indirectly affected by the Federal action (50 CFR §402.02 and 402.14[b][2]). This includes the project footprint and surrounding areas where covered species could be affected by project-related impacts. The action area for the LSJR FS Recommended Plan is shown in Figure 2 and includes: the portion of the San Joaquin River between French Camp Slough and the railroad bridge 14 miles below the Stockton Deep Water Shipping Channel (Stockton DWSC); French Camp Slough from El Dorado Street to the San Joaquin River; the Calaveras River from N. El Dorado Street to the San Joaquin River; portions of the Stockton DWSC between Smith Canal and Fourteenmile Slough; the west side of Fourteenmile, Tenmile Slough, and Fivemile Slough to Mosher Slough; and the south side of Mosher Slough .41 miles beyond N. Eldorado Street up to the railroad tracks.

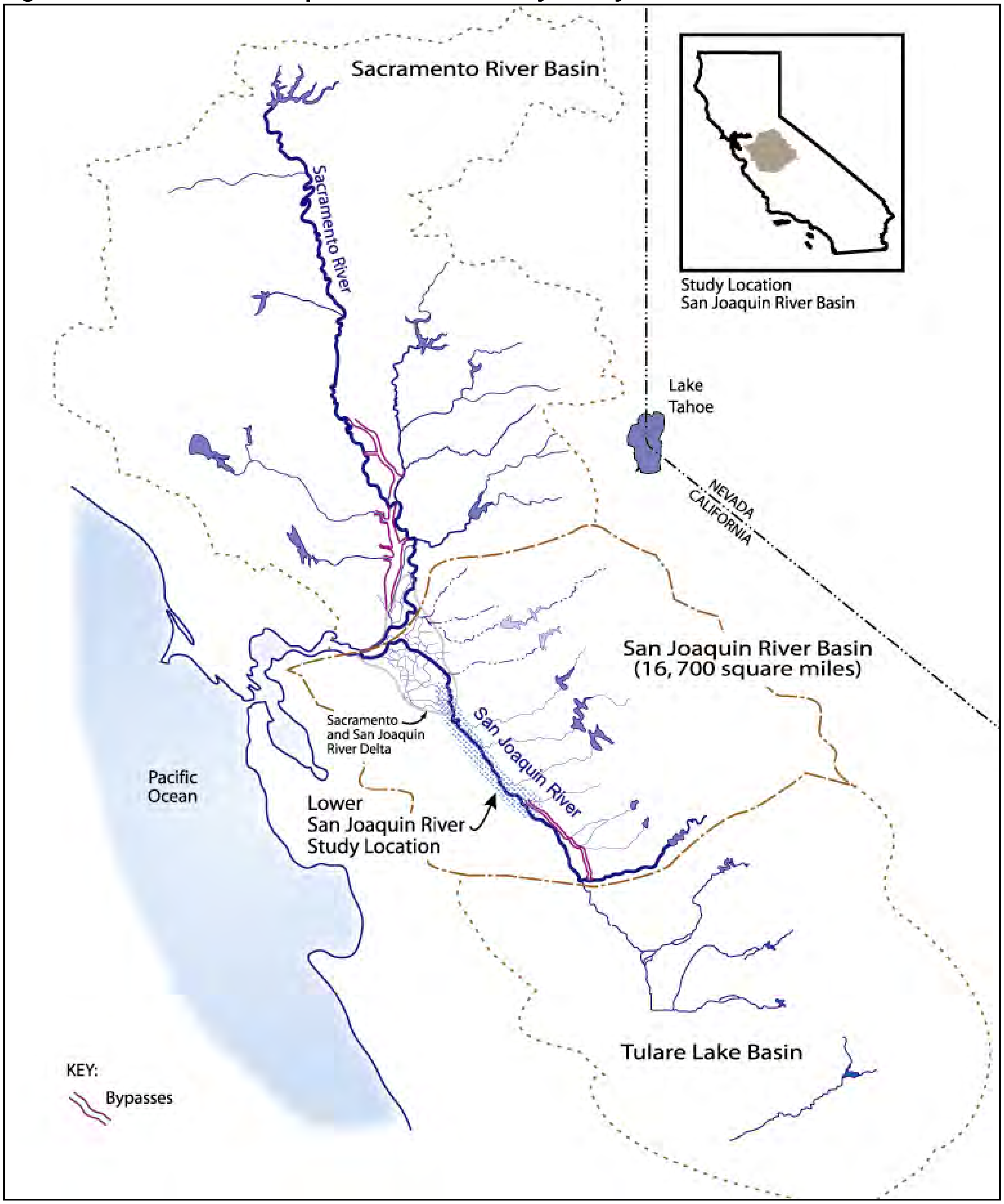
The action area includes perennial waters of the San Joaquin River extending 200 feet perpendicular from the average summer-fall-shoreline and 1,000 feet downstream from the proposed in-water construction areas. This represents the potential area of turbidity and sedimentation effects based on the reported limits of visible turbidity plumes in the Central Valley along the Sacramento River during similar construction activities (NMFS 2008).

2.1 Study Area

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

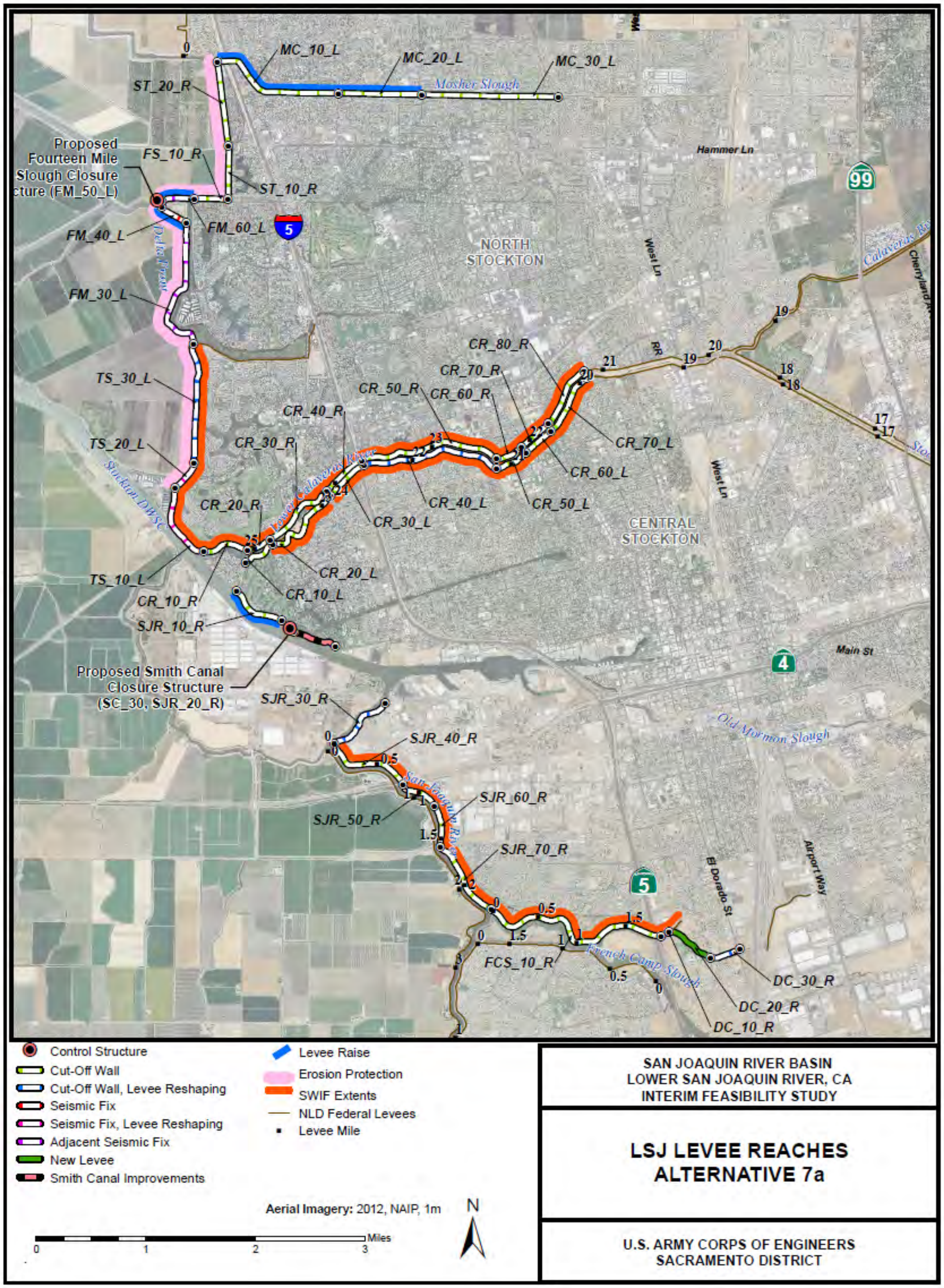
The study area, as defined in the study authorization, includes the main stem of the San Joaquin River from the Mariposa Bypass downstream to the city of Stockton. The study area also includes the distributor channels of the San Joaquin River in the southernmost reaches of the Delta: Paradise Cut and Old River as far north as Tracy Boulevard and Middle River as far north as Victoria Canal. Based on availability of potential non-Federal sponsors, the study focused on approximately 305 square miles encompassing incorporated areas of Stockton, Lathrop and Manteca as well as unincorporated portions of San Joaquin County. During the plan formulation process, the study area was divided into three separable elements. The separable elements are considered to be hydraulically separate, meaning that each area could have stand-alone solutions or alternatives proposed.

Figure 1. Lower San Joaquin River Feasibility Study Area



This BA analyzes the potential effects of the Recommended Plan on Federally-protected resources. The Recommended Plan is located along North and Central Stockton, the Delta Front, Lower Calaveras River and San Joaquin River. The Recommended Plan is to improve levees in these areas and to install and operate two in-water closure structures, one on Fourteenmile Slough and one at the mouth of Smith Canal. The specific measures proposed as part of the Recommended Plan (Alternative 7a) are identified in Table 2 by waterway and reach and shown on Figure 2.

Figure 2. Lower San Joaquin River Feasibility Study Recommended Plan



3.0 PROPOSED ACTION INCLUDING CONSERVATION MEASURES

3.1 Overview

This section describes the Recommended Plan, which consists of the following two broad elements:

- Construction of structural flood risk management features
- Establishment of Engineer Technical Letter (ETL) 1110-2-583 compliant levees

The structural measures that comprise the plan, the measures used on each reach of waterway, and the conservation measures included in the Recommended Plan are described in detail. The approach to establishing ETL compliant levees is described more broadly.

3.1.1 Flood Risk

The Corps has identified a number of problems associated with the flood risk management system protecting the city of Stockton and surrounding areas. There is a high probability that flows in the lower San Joaquin River, Calaveras River, and the Sacramento-San Joaquin estuary (the Delta) or a seismic event would stress the network of levees protecting Stockton to the point that they could fail. The consequences of such a levee failure would be catastrophic, since the area that would be inundated by flood waters is densely urbanized and the flooding could be up to 18 feet deep. The existing levees that are included in the proposed project are identified as “Federal” or “Non-Federal” in Figure 3. At the request of the levee owner, and by meeting specific standards, some Non-Federal levees are include in the Corps Rehabilitation and Inspection Program (RIP) and are eligible for rehabilitation assistance under Public Law (PL) 84-99.

Most levees in the project area require seepage and slope stability improvements in order to meet the Corps criteria. Some levees require slope reshaping, height improvements, and/or erosion protection. The northern portion of the project area is vulnerable to flooding from the west (the delta). Options to improve existing levees immediately adjacent to the city of Stockton to reduce risk from this threat are constrained due to urban development. Therefore, two in water closure structures are also proposed. In the southern part of the project area a new levee extension is proposed on Duck Creek. This BA analyzes the effects of improving the flood risk management system in the vicinity of the City of Stockton. A summary of the remediation measures proposed for each project reach is provided in Table 2 and Figure 2. Appendix C includes a detailed Table (Table C-1) showing the features of the Recommended Plan.

3.1.2 Recommended Plan (Proposed Action)

The Recommended Plan (Alternative 7a) is shown in Figure 2. This plan meets the study objectives of reducing flood risk and flood damages. The structural features of Alternative 7a include approximately 22.5 miles of levee improvements and two closure structures, one on Fourteenmile Slough and the other on Smith Canal. The levee improvements are comprised of cutoff wall, deep soil mixing (seismic), new levee, levee geometry improvements, and erosion protection.

In addition to the structural features, the Recommended Plan also includes several non-structural features to further reduce the consequences of flooding, including Comprehensive Flood Warning Emergency Evacuation Planning and Floodplain Management. A general description of each structural measure is provided in Section 3.3. In Section 3.4, Table 2 identifies and describes the structural measures proposed for each project area and reach. The non-structural measures are not discussed further in this BA.

3.1.3 Changes Since February 2015

Since transmittal of the original BA for this study, the proposed action has been modified to reduce the construction footprint. All designs associated with the Recommended Plan use the largest foreseeable footprint. Using this footprint facilitated our evaluation of the maximum extent the project could affect species in the action area. As design refinements occur in the future, opportunities to further reduce effects on listed species and their designated critical habitat will be considered where practicable and consultation will be reinitiated if necessary.

3.1.4 Nomenclature

The proposed action is referred to in various ways in this and other related documents. All of the following are equivalent:

- Proposed action
- Recommended Plan
- Alternative 7a
- North and Central Stockton – Delta Front, Lower Calaveras River, and San Joaquin River Levee Improvements

3.2 Non-Discretionary and Discretionary Actions

NMFS' letter dated 31 March 2015 requested that the Corps clearly describe its scope of discretion over the proposed action and establish areas of non-discretion. The Corps agrees with the principle stated in the letter that ". . .clearly describe the scope of discretion over the proposed action and conduct a rigorous review to establish areas of non-discretion. Where the scope of the Corps' discretion is not clear, effects should be attributed to the proposed action.”

3.2.1 Non-Discretionary Actions

The Corps has no discretion in regards to the continuing existence and operation of the flood control structures of the Lower San Joaquin River and Tributaries Project (LSJRTP). The responsibility to maintain Civil Works structures so that they continue to serve their congressionally authorized purposes is inherent in the authority to construct them and is therefore non-discretionary. Only Congressional actions to de-authorize the structures can alter or terminate this responsibility and thereby allow the maintenance of the structures to cease.

The Corps has a non-discretionary duty to maintain the LSJRTP and the fact the Corps perpetuates the projects existence is not an action subject to consultation. The Federal government maintains oversight but has no ownership of or direct responsibilities for performing maintenance of the Federal levee system, except for few select features that continue to be owned and operated by the Corps. Considering these exceptions, the great majority of levees, channels, and related flood risk management structures are owned, operated, and maintained by the State of California and local levee and reclamation districts as governed by Corps O&M manuals. The 1959 Standard O&M manual for the LSJRTP is the primary O&M manual for the area. There are two supplemental O&M manuals that cover the project area, the 1963 LSJRTP Unit 1manual and the 1894 Mormon Slough Project manual. The levees of the Lower San Joaquin River Project are part of the LSJRTP and therefore covered in the 1959 O&M manual or one of the supplemental O&M manuals.

3.2.2 Discretionary Actions

Postconstruction Maintenance

Following completion of construction of the Lower San Joaquin River Project, the Corps will prepare a supplement to the 1959 O&M manual which will specify maintenance requirements for these projects. Because the Corps does have discretion in how and when levee maintenance activities are performed (as opposed to the results of maintenance), maintenance is a discretionary activity that is part of the proposed action subject to consultation.

Typical maintenance activities would include vegetation control through mowing, herbicide application, and/or slope dragging; rodent control; patrol road maintenance; and erosion control and repair. Vegetation control typically would be performed twice a year. Herbicide and bait station application would be conducted under county permit by experts licensed by the state for pest control. Erosion control and slope repair activities would include re-sloping and compacting; fill and repair of damage from rodent burrows would be treated similarly. These activities are performed for approximately 20 days annually. Patrol road reconditioning activities would typically be performed once a year and would include placing, spreading, grading, and compacting aggregate base or substrate.

To meet Federal Flood Control Regulations (33 CFR 208.10) and state requirements (California Water Code Section 8370), the Federal Flood Risk Management facilities are inspected four times annually, at intervals not exceeding 90 days. DWR would inspect the system twice a year, and the local maintaining authorities would inspect it twice a year and immediately following major high water events. The findings of these inspections would be reported to the CVFPB's Chief Engineer through DWR's Flood Project Integrity and Inspection Branch (FPIIB).

3.3 Description of Structural Flood Risk Management Measures

Levees in the LSJRFS project area require improvements to address seepage, slope stability, overtopping, and erosion concerns. The Recommended Plan is composed of different structural measures, or building blocks to address these problems. The measures are described in this section. Overall, the Recommended Plan includes: (1) 19.4 miles of seepage cutoff walls; (2) 3.2 miles of geometric improvements consisting of levee slope and crown reshaping to meet Federal standards; (3) 3.5 miles of levee height raises mainly to reestablish the design levee height; (4) 0.5 miles of flood walls/sheet pile walls; (5) 3 miles of seismic improvements, (6) 0.75 miles of new levee, and (7) 5 miles of new erosion protection (a majority of the new protection would be on the landside only; however, existing erosion protection disturbed by construction would be replaced). Note that these features overlap one another and cannot be added up to describe the total project extent. The total amount of horizontal flood features (including closure structures) is approximately 24.5 miles.

These measures would be implemented primarily by fixing levees in place. In addition to levee improvements, the Recommended Plan includes two in-water closure structures. They are also described below. Figure 2 identifies the reaches where each measure would be required. Once a levee is modified, regardless of the measure implemented for the alternative, the levee would meet the Corps levee design criteria. This would include slope reshaping and/or crown widening, where required. The levee crown would be widened to 20 feet minimum on the San Joaquin River and 12 feet minimum on all other levees included in the Recommended Plan. Both landside and waterside slopes of 3:1 would also be established where possible. If necessary, the existing levee centerline would be shifted landward in order to accommodate levee reshaping and height improvements.

3.3.1 Cutoff Walls

The predominant measure used to improve levee performance would be a slurry cutoff wall for the length of the project, except for the portion of the levees requiring a seismic fix for some levees in north Stockton. See Figure 4 for a typical Cutoff wall plan.

Description

To address seepage concerns, a cutoff wall would be constructed through the levee crown. Seepage cutoff walls are vertical walls of low hydraulic conductivity material constructed through the embankment and foundation to cut off potential through- and under-seepage. In order to be effective in reducing under-seepage, cutoff walls usually tie into an impervious sub-layer.

Construction Methods

The cutoff wall would be installed by one of two methods: (1) conventional open trench cutoff wall, or (2) deep soil mixing (DSM) cutoff wall. The method of cutoff wall selected for each reach would depend on the depth of the cutoff wall needed to address the seepage. The open trench method can be used to install a cutoff wall to a depth of approximately 80 feet. For cutoff walls of greater depth, the DSM method would be utilized.

Preparation

Prior to cutoff wall construction using either method, the construction site and any staging areas would be cleared, grubbed, and stripped. The levee is typically degraded by one-half the levee height to provide a sufficient working surface (approximately 30 feet) and reduce the risk of hydraulically fracturing the levee embankment from the insertion of slurry fluids.

Construction

<u>Conventional Method</u>. The conventional slurry method for these cutoff walls is an open trench method that uses an excavator with a long-stick boom to excavate the slurry trench. The cutoff walls for the project area would be a minimum of 3-feet in width; the cutoff wall would be constructed from a working surface elevation to a design depth at least 3-feet into an impermeable layer. The conventional method has a maximum depth of about 70 to 80 feet.

During construction, bentonite-water slurry is used to keep the trench open and stable prior to backfilling with the permanent wall material. Soil is mixed with bentonite to form soil-bentonite (SB) and then pushed into the trench, displacing the bentonite-water slurry. After a predetermined settlement period, an impervious cap is constructed above the cutoff wall and the levee is reconstructed using suitable material (Type 1 levee fill) to the correct design elevation and current Corps levee design criteria.

<u>Deep Soil Mixing Method</u>. Cutoff walls in North and Central Stockton would extend up to 70 feet below the working surface elevation. The DSM method would require large quantities of cement bentonite grout. This would necessitate the use of a contractor-provided, on-site batch plant and deliveries of concrete aggregate, concrete sand, bentonite, and cement. The batch plant would be powered by generators or

electricity from overhead power lines and would be located within the project area or in an adjacent staging area. The batch plant area would consist of an aggregate storage system, aggregate rescreen system (if needed), rewashing facility (if needed), the batching system, cement storage, ice manufacturing, and the grout mixing and loading system. All aggregate used within the batch plant operations would be obtained from existing local commercial off-site sources and delivered to the site.

From the batch plant, the grout mixture would be transported through high-pressure hoses (8,000 pounds per square inch [psi]) to the location of construction. At the construction site, a crane supported set of two to four mixing augers would used to drill through the levee crown and subsurface to a maximum depth of approximately 140 feet. As the augers are inserted and withdrawn, the cement bentonite grout would be injected through the augers and mixed with the native soils. An overlapping series of mixed columns would be drilled to create a continuous seepage cutoff barrier. Once the slurry has hardened it would be capped and the levee embankment would be reconstructed with impervious or semi-impervious soil.

Excavated and Borrow Material Staging. Excavated and borrow material (from nearby borrow sites) would be stockpiled at staging areas. Haul trucks, front end loaders, and scrapers would bring borrow materials to the site. The material would then be spread evenly and compacted according to levee design plans. The levee would be hydroseeded once construction was completed.

Equipment

Equipment used in construction includes a water/bentonite slurry mixing facility, the use of a backhoe or long reach trench excavator, a bulldozer for moving soil and mixing slurry material and a water line in order to produce the slurry product. The water/bentonite slurry is mixed again on site with soil as the final product used during the trench excavation.

Risk Management

Trench Management. For conventional cutoff walls (up to 80 feet below working surface), the integrity of the open trench is maintained through minimum specifications for density of the trench bentonite slurry mixture. There are QA/QC testing requirements throughout the construction process that monitor mixture density to assure an open trench is maintained; walls exceeding 75 feet in depth would require the use of a deep mix method not involving an open trench.

Containment of Trench Slurry - Possibility of Fracture. To address the question of containment of trench slurry, the possibility of a fracture is reduced by degrading the levee to one half of its original height to achieve a larger levee prism; this also creates a wider working surface for construction activities and placement of barriers to capture any surface materials. If a fracture were to occur, work would immediately stop and federal, local, and environmental agencies would be contacted to determine the extents and degree of remediation needed to contain the effects. The possible occurrence of such an event would be detailed in the Environmental Protection section of the contract specifications (not developed for feasibility study).

Containment of Trench Slurry-Displacement during Construction. Bentonite has a minimum hydration period and is hydrated and stored in large Baker tanks until needed. Once construction begins, depending on the available room on site, the hydrated bentonite is mixed in a container or a small pond and pumped to the trench as it is excavated. As soil is excavated, trench slurry levels drop and more slurry is added. As wall product is mixed and placed in the trench, fluid is displaced; however, if excavation and production are occurring in tandem, the level of trench slurry remains within a few feet of the top of trench throughout the day with minimum top off occurring. As the wall closes in towards its final stationing, trench slurry levels are no longer balanced by excavation and fill; the excess slurry will then be pumped off the trench back to the pond or Baker tanks where it was originally produced and disposed of offsite.

3.3.2 Levee Slope Reshaping (also called “Geometric Fix”)

Description

Levee reshaping involves grading high areas and or placing additional soil in depressions and compacting it in order to restore the levees to Corps levee design criteria for side slopes and crown width. For the Recommended Plan, the minimum crest width for major tributary levees is 20 feet and the minimum crest width for minor tributary levees is 12 feet. Existing levees with landside and waterside slopes as steep as 2H:1V (i.e., for every 2 feet of horizontal distance, there is a 1 foot increase in height) may be acceptable if slope performance has been good and if the slope stability analyses determined the factors of safety to be adequate, otherwise the landside and waterside slopes should have 3H:1V slopes.

Preparation

Prior to construction, the waterside levee crest edge would be cleared and grubbed and the crown and existing landside slope would be stripped to remove 0.5 to 1 foot of material, and occasionally up to 2 feet of material, depending on local conditions.

Construction

To correct levee geometry, suitable material would be placed along the landside of existing levee slopes where needed to provide the minimum slope, required height, and crest width to meet current Corps levee design criteria, as detailed above. After construction, slopes would be hydroseeded for erosion control.

The additional area added to the landside toe by widening varies from 1 to 30 feet, depending on the existing width of the levee. The slope reshaping typical plan is shown in Figure 5. Slope reshaping and levee height fixes may require relocation of landside toe drains and ditches. These toe drains and ditches would be reestablished landward of the improved levee toe and would continue to function as they did before the levee improvements were constructed.

Levee slope reshaping may require removal of erosion protection such as rock revetment. Upon completion of the reshaping, the erosion protection would be replaced.

Equipment

The equipment used would be similar to that used for levee raising.

3.3.3 Seismic Remediation

Description

The seismic deep soil mixing technique is a feature meant to keep the levee from liquefying during seismic activity. This measure would be implemented to provide seismic stability to the Delta Front levees of North Stockton that are frequently loaded (due to slough water surface elevations that are tidally influenced) and that are also subject to potentially significant deformations due to a seismic event. The seismic remediation measure would involve installation of a grid of drilled soil-cement mixed columns (Figure 6). The columns would be a series of overlapping deep-soil-mixing columns aligned longitudinally with, and transverse to, the alignment of the levee extending beyond the levee prism. This measure would minimize significant deformation of the levee during a seismic event as well as reduce risk of seepage and provide improved landside slope stability. Not that some levees supporting seismic repairs will be set back from the adjacent slough to enable some mitigation for project impacts to be accomplished on site.

Seismic Remediation with Setback. This measure is used along a portion of Fourteenmile Slough. The remediation techniques would be similar to what is described above. The difference would be that the existing levee would be partially degrade (about half way) and a new levee would be constructed landward of the remnant existing levee (Figure 7). The land between the remnant existing levee and the new levee would become a mitigation planting area to off-set project environmental impacts. About 14 acres of habitat would be created between the water's edge and the vegetation free zone of the new landside levee. The length of the offset area would be about 7,000 feet and the width would vary from about 60 feet to about 90 feet. See Figure 8.

Preparation

Prior to construction, the area would be cleared and grubbed. The material obtained from degrading the levee would extend up to 60 feet beyond the existing levee and would be compacted such that the material forms an extension to the existing levee. Approximately the top half of the levee would be degraded. The degraded material would be placed landward as shown in Figure 7.

Construction

The crest of the levee would be reconstructed with suitable material to comply with the Corps levee design criteria. A determination may be made during the future design that all of the degraded material may not be necessary to extend the levee to the proposed toe shown in Figure 6. The proposed toe could be located along an imaginary line extending from the landward face of the proposed levee to existing grade. During the current feasibility planning the maximum extent of the reconstruction berm is shown in order to show the maximum impacts which could occur.

Deep soil mixing augers would be used to construct a continuous grouping of cells spaced equally in both the longitudinal and transverse direction to the levee alignment as shown in the plan view in Figure 6. A hose attached to the auger would allow for the cement bentonite slurry to be injected into the soil during auguring. This allows for deep soil mixing. After construction is completed, the levee crest would then be topped with a 6-inch aggregate road, and slopes would be hydroseeded for erosion control. This degrading and reconstruction effort would occur along 3 miles of Fourteenmile Slough and Tenmile Slough.

The location of the individual columns and the pressures to be used during construction will be defined during PED, if the project is authorized and funded. Column locations will be placed to minimize chances that frac-out would occur.

Equipment

A truck mounted with a mechanical deep soil mixing auger and a cement bentonite equipment mixer and pump delivery system would be used.

3.3.4 Levee Raise (Levee Height Fix)

Description

This measure describes the construction action that would be taken to repair the levee height in locations where the crown has slumped and to raise the existing levee height to reasonably maximize net benefits. To raise the levees, additional borrow material would be added after cutoff walls and levee reshaping improvements are completed (Figure 5). The additional material would be brought from nearby borrow sites, stockpiled in staging areas then hauled to the site with trucks and front end loaders. Material would be spread evenly and compacted according to levee design plans. The levee would be hydroseeded once construction was completed.

In some locations, the height could increase up to 5 feet; however, most raises would be 1.5 to 3 feet. An increase in levee height may require additional levee footprint area to meet design requirements for minimum levee slope and crown width.

Preparation

Prior to construction, the waterside levee crest edge would be cleared and grubbed and the crown and existing landside slope would be stripped to remove ½ to 1 foot of material, and occasionally up to 2 feet of material, if local conditions warrant. The levee raise will involve scraping, or ripping, the existing levee at the crown and along the landside slope and placing and compacting additional soil material in these areas.

Construction

To construct a levee raise, suitable material would be placed along the crown and landside of existing levee slopes, where needed, to provide the minimum slopes, required height, and crest width that meet current Corps levee design criteria. Fill materials would then be compacted to the design specification. The typical plan for a levee raise is shown in Figure 5.

Equipment

A hitched scraper, hitched discs or hitched ripper are examples of what might be used to loosen existing earth material in order to achieve a bond between new soil material and the existing levee. Other pieces of equipment that would likely be used during the process would be a water truck, a grader, belly dump trucks, a bulldozer, a manual compactor or a sheep's foot roller.

3.3.5 Floodwall

Floodwalls are an efficient, space-conserving method for containing unusually high water surface elevations. They are often used in densely developed areas, where space is limited. This measure consists of construction of about 825 linear feet of sheetpile floodwall from the southern portion of Dad's Point to high ground at Louise Park. The wall height would be an average of three to four feet above the ground surface. A metal cap may be placed on the top of the sheetpile or the sheetpile maybe encased in concrete. The floodwall would be approximately 12 to 18 inches wide.

Preparation

To begin the floodwall construction, the area would be cleared, grubbed, stripped, and excavation would occur to provide space to construct the footing for the floodwall.

Construction

The floodwall would primarily be constructed from pre-fabricated materials, although it may be cast or constructed in place. The floodwall would be constructed almost completely upright. Floodwalls mostly consist of relatively short elements, making their connections very important to their stability. The floodwalls would be designed to disturb a minimal amount of waterside vegetation. The height of the floodwall would vary from 1 to 4 feet, as required by water surface elevations. The waterside slope would be re-established to its existing slope and the levee crown would grade away from the wall and be surfaced with aggregate base

3.3.6 New Levee

Description

This measure would involve constructing new levees to reduce the flood risk to some areas or to prevent waters from outflanking (i.e., flowing around the ends of the levees and entering the area intended to be protected) the existing levee system during high water events. A new levee is planned for the upstream 0.75 mile of Duck Creek to tie the existing levee into the railroad berm along the north side of Duck Creek.

Preparation

To construct the new levee, the construction footprint area would be cleared and grubbed and a new levee foundation would be excavated. A levee inspection trench would be excavated across the entire proposed centerline of the new levee. The depth of the inspection trench would vary depending upon levee height, as required by Corps guidance and the State’s Urban Levee Design Criteria (ULDC). For the purposes of the impact analysis, a depth of 3 to 6 feet is assumed.

Construction

Construction of the new levee section would proceed in accordance with the Corps levee design criteria, with suitable material placed in 6- to 8-inch lifts, moistened, and compacted to design specification until the design elevation has been reached. A cutoff wall would be constructed through the center of the new levee, if needed, to prevent through- and under-seepage. For new levees that require erosion protection, quarry stone riprap would next be applied to armor the newly completed levee's waterside slope and provide protection against erosion. Fill material for levee construction would be obtained from local construction borrow areas and commercial sources, and would be delivered to the levee construction sites using haul trucks. A gravel road would be constructed on the crown of the new levees. Following construction, the levee slopes would be reseeded with natural grasses to prevent erosion. A typical plan for a new levee with a cutoff wall is shown in Figure 4.

Equipment

New levee with a slurry wall would likely require graders, scrapers, belly dump trucks, bulldozers, and possibly backhoes. The slurry wall construction would involve that equipment mentioned earlier for this task.

3.3.7 Closure Structures

Description

This measure would include construction of closure structures at the mouth of backwater sloughs at Smith Canal and on Fourteenmile Slough to reduce flood risk along those sloughs. The structure would extend from the end of Dad's Point to the right bank of the San Joaquin River at the Stockton Golf and Country Club. The closure structures would control back-flooding from the San Joaquin River and Delta during high water events.

The proposed closure structures would consist of a fixed sheet pile wall structure (about 800 feet long) with an opening gate structure sufficiently large to allow for the safe passage of boats and other watercrafts. Fish and other aquatic organisms would also be able to pass through these gates when they are open. The opening portion of the closure structure would be an automated gate that may open upward or outward. The gate would be approximately 50-feet wide, and would be constructed of stainless steel. The gate would be attached to a concrete foundation using stainless steel anchor bolts. A small building, about 400 square feet, would be built at the end of Dad's Point on land directly adjacent to the closure structures. The building would be designed to store equipment required to operate the gate. As needed, a sheet pile floodwall would be constructed adjacent to the control structures to tie the structures into the adjacent levee or high ground areas.

Preparation

The construction of sheet pile walls on land would initially require that clearing and grubbing of vegetation be provided for approximately a 35-ft wide footprint for the length of the sheet pile wall. Survey markings on land could be expected post clearing and grubbing.

Preparation for the construction of the closure structure and sheet pile walls in the water would require a working platform (barge) and a tug boat in order to move the barge around. The survey equipment for use in and around water would likely be a laser guided system.

Construction

Construction would not require dredging, draglining, or in-water excavation. The in-water work is being accomplished without the use of a separate cofferdam. The cofferdam and the permanent sheet pile are one in the same except for the gate construction where the sheet pile will be cut away upon completion of the concrete structure. The “wing” structures supporting the operable gates and the related floodwalls would permanently block a portion of each of these waterways.

The following are the details of the sheet pile installation and miter gate installation on Smith Canal. The closure structure on Fourteenmile Slough would be a scalable version of the Smith Canal. However, Fourteenmile Slough will require pumping capacity in order to evacuate water from the slough during high water events.

For the dual sheet pile wall construction:

1. Two sheet pile walls will be constructed parallel to each other and 20 feet apart. They would installed the same way a single sheet pile wall is installed. The south dual sheet pile will be installed during the first in-water construction season beginning June 30. Once the miter gate is operational, the north section of the dual sheet pile wall will be installed in the following year’s in-water construction season.
2. The space between the dual sheet piles will be dewatered for installation of cross ties, bracing and gated culverts between the two sheet pile walls.
3. Granular fill material will then be placed between the two sheet pile walls without dewatering up to within 3 feet of the top of the dual sheet pile walls.
4. Total installation time for the dual sheet piles is about 4 months.

For the miter gate construction:

1. Metal sheet pile cofferdam is required to allow dry work to occur on the foundation and walls for the gate. The cofferdam sheet piles will be formed for the foundation of the gate structure (approximately 70 ft by 70 ft). This takes about 3 weeks to install.
2. Once the coffer dam is installed, initial dewatering of the sheet pile coffer dam will occur and a small amount of dewatering will continue to occur during the installation of the gate structure.
3. Concrete cylinder piles (approximately 24 inch diameter) will be driven inside the coffer dam to provide support for the concrete floor and walls. Cylinder piles will be installed using an impact hammer.
4. Reinforced concrete floor and walls will be formed and placed using the cylinder piles for support.
5. A metal gate will be attached to the concrete floor and walls. Installation of the gate foundation, walls, and miter gate is scheduled to take 6 months.
6. Two of the sides of the coffer dam will be used to form the walls of the gate structure. The remaining two sides that block the navigable openings of the gate will be cut by divers at the sides of the wall and top of the gate foundation to provide the necessary opening.

Equipment

The equipment necessary for work in the water would include a barge as a working platform for the installation process, and a tug boat necessary for the movement and correct placement of the barge for construction. Once a desired location for the barge has been established an anchoring system would be necessary for the barge during the installation of the sheet pile wall. The tug would be expected to remain nearby during the construction of the walls and closure gates.

The installation of the sheet pile wall would require that a crane be assembled on the barge. A vibratory hammer would be installed at the end of the crane for the installation of the sheet pile wall. Depending on the depth necessary for the installation of the sheet pile, a vibratory hammer may not have the driving power necessary for complete installation. An impact hammer may be needed for complete installation in order to reach the depths necessary to fully install the sheet pile. The installation of the sheet pile wall on land will require the use of an impact hammer for installation of the walls to the proper depth.

The construction of the gate structure will require that support piles be installed for the foundation of the closure gate. The support piles will require that an impact hammer be used to drive the piles to the proper depth.

After the installation of the walls and the piles, the barge would continue to be used to ferry construction workers and small equipment to various points along the wall and piles to complete the installation of the wall and the construction of the closure gate foundation. The platform for the closure gates would be constructed as a pre-cast ready-to-install floor, or the floor could be formed and concrete could be placed on site. The walls could also be pre-cast or could be formed and placed on-site. The equipment and materials needed for construction would be ferried to the construction site with the barge.

3.3.8 Erosion Protection

Description

The new erosion protection included in the Recommended Plan will be placed either on the waterside of the levee or on the landside of the levee. All of this new erosion protection is placed above the waterline. The purpose of the North Stockton erosion protection is to protect the project levee from wind and wave run-up erosion which could occur if Delta levees to the west of the project levee were to fail allowing flooding of land immediately west of the project levee. The purpose of the Central Stockton erosion protection on Duck Creek is to protect the backside (landside) of the levee from erosion that could occur if floodwaters moving from the south to the northeast were to wrap around the end of the project levee and back up against it. Although this would be the only placement of new erosion protection, any existing riprap disturbed during construction of project features would be replaced.

Construction

For the purpose of this study, riprap was used to describe erosion protection features and the associated impacts. Approximately 75,000 tons of imported quarry stone riprap would be placed to a thickness of 2 feet along the landside to prevent wind wave erosion during high water. A sand filter would also be placed prior to the riprap layer to prevent the migration of fines causing gravel instability and decreased erosion protection performance. In Preconstruction Engineering and Design (PED), other erosion protection methodologies besides riprap may be explored.

Equipment

A dump truck or belly dump is likely the predominant piece of equipment that will get the rock in close proximity to its final resting place and a hydraulic excavator would be used to settle the rock into place. Rock can also be placed from a barge using a hydraulic excavator. A dozer may also be necessary following the barge unloading to settle the rock into place.

3.3.9 Jet Grouting

Description

Jet grouting typically is used in constructing a slurry cutoff wall to access areas other methods cannot. In this regard, it is typically a spot application rather than a treatment to be applied on a large scale. Jet grouting would be used around existing utilities not proposed for removal, and at bridges along levees in the project area. It involves injecting fluids or binders into the soil at very high pressure. The injected fluid can be grout; grout and air; or grout, air, and water. Jet grouting breaks up soil and, with the aid of a binder, forms a homogenous mass that solidifies over time to create a mass of low permeability.

Preparation

To provide a wide enough working platform on the levee crown, the upper portion of some segments of the levee may require degradation with a paddle wheel scrapper. Material would be scraped and stockpiled at a nearby stockpile area. Hauling at the work area would involve scraper runs along the levee to the staging area, and grout, bentonite, and water deliveries to the batch plant.

Construction

To initiate jet grouting, a borehole would be drilled through the levee crown and foundation to the required depth (to a maximum depth of approximately 130 feet) by rotary or rotary-percussive methods using water, compressed air, bentonite, or a binder as the flushing medium. A high-pressure pump would convey grout, air, and/or water through pipelines that run the length of the site through the drill string to a set of nozzles located just above the drill bit. Smaller equipment could be used in combination with the single phase–fluid system and could be permanently trailer-mounted to permit efficient mobilization and easy movement at the job site. During this process the drill string is rotated and slowly withdrawn. Use of the double, triple and superjet systems create eroded spoil materials that would be expelled out of the top of the borehole. The spoil material would contain significant grout content and could be used as a construction fill.

Jet-grouted columns range from 1 to 16 feet in diameter and typically are interconnected to form cutoff barriers or structural sections. One construction crew, consisting of a site supervisor, pump operator, batch plant operator, chuck tender, and driller under ideal conditions, can construct two 6-feet-diameter, 50-foot columns per day consisting of approximately 100 cubic yards of grout injected per 8-hour shift. Ideal conditions would be characterized by no technical issues, such as loss of fluid pressure, breakdown of equipment, or subsurface obstructions to drilling operations occurring at either the batch plant or the drilling site.

Equipment

Equipment required for jet grouting consists of a drill rig fitted with a special drill string; a high pressure, high flow pump; and an efficient batch plant with sufficient capacity for the required amount of grout and water, supporting generators and air compressors, holding tanks, and water tanks, with bulk silos of grout typically used to feed large mixers.

3.3.10 Encroachments

Utility encroachments such as structures, certain vegetation, power poles, pump stations, and levee penetrations (e.g., pipes, conduits, cables) would be brought into compliance with applicable Corps policy or removed depending on type and location. This measure would include the demolition of such features and relocation or reconstruction as appropriate on a case-by-case basis (or retrofit to comply with standards). Utilities replacements would occur via one of two methods: (1) a surface line over the levee prism; or (2) a through-levee line equipped with positive closure devices.

Private encroachments would be removed by the non-federal sponsor or property owner prior to construction of the Recommended Plan.

3.4 Establishment of ETL Compliant Levees

3.4.1 Corps “Guidelines for Landscape Planting and Vegetation Management at Levees, Floodwalls, Embankment Dams, and Appurtenant Structures,” (ETL 1110-2-583)

The Corps “Guidelines for Landscape Planting and Vegetation Management at Levees, Floodwalls, Embankment Dams, and Appurtenant Structures,” (ETL 1110-2-583) dated 30 April 2014, provides the standards for vegetation on and adjacent to Corps facilities. To be in compliance with this standard, levees and floodwalls and 15 feet landward and waterward of the levee toes or floodwall face, must be maintained free of woody vegetation unless a variance to this requirement is granted by the Corps.

Variance

A levee or floodwall may be considered for a variance to the ETL standard after in depth engineering analyses have been completed that demonstrate that the levees and/or floodwalls are not imperiled by maintaining woody vegetation on or within 15 feet of the levee or floodwall.

3.4.2 The Recommended Plan

Structural Flood Risk Management Features

In order to construct the structural flood risk management features of the Recommended Plan, vegetation will need to be removed from the upper half of the levee. Constructing some features, like slope reshaping or height repairs, will also require removal of all vegetation from the landside levee face and the landside easement. Constructing the two closure structures and the floodwall on Dad’s Point (at Smith Canal) will require removal of waterside vegetation from the waterside levee toe and waterside easement, or from the bank.

ETL Compliance

During the construction phase, the levees included in the Recommended Plan will be brought into compliance with the ETL. To accomplish this, the levees will undergo intensive engineering evaluation during PED to determine their suitability for a variance to the ETL. Based upon the information available at this time, and using engineering judgment, we estimate that 50% of the existing vegetation on the lower waterside slope and within the waterside easement may be allowed to remain. We estimate that almost none of the vegetation on the landside levee slope or within the landside easement would be allowed to remain.

Variance Evaluation Process

During PED, all levee reaches will be evaluated for a vegetation variance for the remaining vegetation using data that is not currently available in feasibility. This risk-based process involves: determining what species of trees are present in the proposed variance zone; determining the maximum size that each trees would grow to; analyzing the root ball size that would be expected for mature trees, which would be used to identify the size of a hole left if the tree falls during a flood event; analysis of the amount of additional scour that could occur in a flood event; seepage and stability analysis accounting for any newly constructed features; and development of cross-sections illustrating the trees, root systems, and levee prism. Trees that we would likely identify as needing to be removed include dead trees and nut trees. Nut trees may attract burrowing rodents which may become a levee safety concern.

3.5 Recommended Plan Structural Measures by Reach

The main structural measures included in the Recommended Plan are summarized in Table 2 by area and reach. A detailed table describing the Recommended Plan is included in Appendix C (Table C-1). A summary of structural measures included in the Recommended Plan by reach is shown in Figure 2. A summary of the quantity of each structural measure in the Recommended Plan is shown in Table 3.

Table 2. Alternative 7a Measures by Area and Waterway

Waterway	Reach	Proposed Measure(s)
North Stockton		
Mosher Slough	Thornton Road to UPRR railroad tracks	Cutoff wall
Mosher Slough	Shima Tract to Thornton Road	Cutoff wall Levee height fix (sea level rise)
Shima Tract	Mosher Slough to Fivemile Slough	Cutoff wall Erosion protection (landside)
Fivemile Slough	Shima Tract to Fourteenmile Slough	Cutoff wall Erosion protection (landside)
Fourteenmile Slough	Fivemile Slough to Proposed Closure Structure	Seismic Fix Slope Reshaping Levee height fix (sea level rise) Erosion protection (landside)
Fourteenmile Slough	Approximately 1,500 feet west of Fivemile Slough	Closure Structure
Fourteenmile Slough	Approximately 1,250 feet southeast setback out from proposed closure structure	Seismic Fix Levee height fix (sea level rise) Erosion protection (landside)
Fourteenmile Slough	From setback cut south to Tenmile Slough	Seismic Fix Adjacent levee

Waterway	Reach	Proposed Measure(s)
		Slope Reshaping Erosion protection (landward)
Tenmile Slough	Fourteenmile Slough to March Lane	Cutoff wall Slope Reshaping Erosion protection (waterside)
Tenmile Slough	March Lane to West March Lane/Buckley Cove Way	Seismic Fix Slope Reshaping Erosion protection (waterside)
Tenmile Slough/ Buckley Cove Marina/ San Joaquin River	West March Lane/Buckley Cove Way to Calaveras River	Seismic Fix Slope Reshaping
Calaveras River – Right/North Bank	San Joaquin River to North El Dorado Street	Cutoff wall
Central Stockton		
Calaveras River – Left/South Bank	San Joaquin River to approximately I-5	Cutoff wall
Calaveras River – Left/South Bank	Approximately I-5 to approximately North Pershing Avenue	Cutoff wall Slope Reshaping
Calaveras River – Left/South Bank	Approximately North Pershing Avenue to approximately El Dorado Street	Cutoff wall
San Joaquin River	From approximately 2,100 feet upstream of the Calaveras River to the proposed Smith Canal Closure Structure	Cutoff wall Levee height fix (sea level rise)
Smith Canal	At the mouth of the canal between Brown's Island and Dad's Point	Closure Structure
Smith Canal	Dad's Point from the Closure Structure to approximately 375 feet down Monte Diablo Avenue	Floodwall
San Joaquin River	Railroad bridge just upstream of the Port of Stockton to Burns Cutoff	Cutoff wall Slope Reshaping
San Joaquin River	Burns Cutoff to French Camp Slough	Cutoff wall
French Camp Slough – Right/North Bank	French Camp Slough confluence with the San Joaquin River to approximately 500 feet southwest of I-5[1]	Cutoff wall
Duck Creek	500 feet past I-5 cross to approximately Odell Avenue	New levee
Duck Creek	Approximately Odell Avenue to McKinley Avenue	Cutoff wall Levee reshaping Levee Height Fix

[1] Note that some specific sections of this reach have been repaired by RD 404 and will be excluded from the Recommended Plan.

Table 3. Summary of Structural Measures Included in the Recommended Plan by Quantity

Structural Measure	Alternative 7a
Cutoff walls	20.1 miles
Levee Reshaping	6.1 miles
Floodwall	0.2 miles
New Levee	0.75 miles
Erosion Protection (landside)	4.9 miles
Seismic Remediation (about 1.3 miles will include a Setback and partial degrade of the existing level)	3 miles
Closure Structure- Smith Canal	1
Closure Structure Fourteenmile Slough	1

3.5.1 North Stockton Area

Levee Improvements

The North Stockton area includes improvements to the Mosher Slough south levee, Shima Tract east levee, Fivemile Slough/Fourteenmile Slough north levee, Fourteenmile Slough west levee, Tenmile slough east levee, and San Joaquin River east levee. The measures proposed to improve the levees in the North Stockton area include Cutoff walls, levee height fixes, erosion protection, seismic (deep soil mixing) fixes, and slope reshaping. In addition, a closure structure would be installed across Fourteenmile Slough, approximately 1,500 feet west of Fivemile Slough. These measures are described in Section 3.3. The locations of each of the fixes are shown on Figure 2**.**

Closure Structure on Fourteenmile Slough

In addition to the levee improvement measures, there is also a closure structure proposed for Fourteenmile Slough. The closure structure would be located across Fourteenmile Slough from the Fivemile Slough/Fourteenmile Slough north (right) levee to the Fourteenmile Slough south/west (left) levee. The closure structure would be consistent with the design described in Section 3.3.

In addition, this portion of the study area has a high risk of seismic events. Operation of the closure structure would limit the water saturation levels in Fourteenmile Slough during high water events, which would reduce the risk of levee damage from both seismic and high water events.

3.5.2 Central Stockton Area

Levee Improvements

The Central Stockton area includes levee improvements to the Calaveras River, San Joaquin River, Smith Canal, and French Camp Slough. For the Calaveras River, approximately 4.25 miles of the north bank (to approximately El Dorado Street) and approximately 3.3 miles of the south bank (to approximately Pacific Street) would be improved with a combination of Cutoff walls, slope reshaping, and height fixes. These measures are described in Section 3.3. The locations of each of the fixes are shown on Figure 2**.**

Closure Structure on Smith Canal and Floodwall on Dad's Point

In addition to the levee improvements, a closure structure would be installed across the mouth of Smith Canal from the San Joaquin River east levee at Brown's Island to the end of Dad's Point. A floodwall (5 to 10 feet high) would also be constructed on Dad's Point to tie the closure structure into the high ground on the shoreline. The average height of the wall would be 5 to 6 feet from the waterside. The design would be consistent with the measure described in Section 3.3. The closure structure would be operated to prevent inflow into Smith Canal during high water levels in the Delta and San Joaquin River. This would limit the level and duration of water saturation and reduce the risk of levee damage or failure.

New Levee on Duck Creek

To further reduce the risk of flooding, a new levee would also be constructed at Duck Creek. This levee would be an extension of the existing French Camp Slough north levee and would extend approximately three-fourths of a mile from French Camp Slough to the rail yard. The new Duck Creek levee would be constructed consistent with the measures described in Section 3.3.

3.6 Borrow Material and Sites

A maximum of 1.4 million cubic yards (cy) of borrow material and 138 acres of borrow lands could be required to construct the Recommended Plan. Because project development is in the preliminary stages of design, detailed studies of borrow needs have not been completed. If the project is authorized and funded, detailed evaluation of borrow requirements, identification and detailed technical evaluation of potential borrow sources, would be completed during PED. This would include appropriate literature review, site visits, informal consultation, and surveys to determine the presence or potential presence of Federally listed species or their designated critical habitat. Potential borrow sites with actual listed species occurrences or with the potential for occurrences would be avoided.

Sufficient quantities of appropriate borrow materials are available within 25 miles of the project. To the extent feasible, borrow material would be obtained from a licensed, permitted facility that meets all Federal and State standards and requirements. In addition, many acres of farmland and vacant land currently exist near the project and borrow could be obtained from these lands. In selecting borrow areas, lands closest to the construction sites would be evaluated for availability and suitability first before evaluating lands further from the project. Additionally, borrow site selection would be based on the least environmentally damaging options, the ability to remove and transport the material, and economic feasibility. It is assumed that borrow material would be obtained from willing sellers.

The excavation limits on the borrow sites would be established in accordance with local regulations and would provide a minimum buffer of 50 feet from the edge of the borrow site boundary. From this setback, the excavated slope from existing grade down to the bottom of the excavation would be no steeper than 3H:1V. Excavation depths from the borrow sites would be determined based on need, available suitable material and local groundwater conditions. The borrow sites would be stripped of topsoil material and excavated to appropriate depths. Once material is extracted, topsoil would be replaced and borrow sites would be returned to their pre-project condition whenever possible and in accordance with the necessary Reclamation Plan.

3.7 Construction Duration and Construction Footprint (Including Staging)

3.7.1 Construction Schedule

Overall Schedule and Sequencing

For planning purposes, construction is estimated to begin in the Central Stockton area in 2018. Construction in that area is expected to last approximately 3 years, concluding in 2020. This is an estimated schedule because Congress has not authorized or appropriated funds for detailed design or construction. Construction in North Stockton is estimated to begin in 2021. Construction in this area would last 8 years, ending in 2028. Construction of the full project would take 12 years.

Annual Work

The average breakdown of work per year per area is described in this paragraph. For Central Stockton the work averages out to 3 miles of slurry Cutoff wall, two-thirds of a mile of geometric improvements, and a half mile of new levee construction per year. During the 3 year span a closure gate would be constructed for Smith Canal, but would likely be accomplished mainly over 2 summers. For north Stockton the work averages out to one and a quarter miles of slurry Cutoff wall, half of a mile of geometric improvements, three-eighths of a mile of seismic remediation, and three-fifth of a mile of rock revetment per year.

Construction Pace. For work of this type, the expected pace of construction is generally estimated be about:

- A levee 10-feet high and one mile long can be raised 1-foot in 3 ½ days not including mobilization and demobilization. A similar section of levee can be raised 2-feet in 7 days time.

- A levee 18-feet high and one mile long can be raised 1-foot in 5 ½ days not including mobilization and demobilization. A similar section of levee can be raised 2-feet in 11 ½ days time.

Construction Timing. Construction would conform to all applicable state and Federal laws, and would generally occur on the San Joaquin River from the middle of July through the end of October. For other rivers, streams, and sloughs, construction would occur from the middle of April through the end of October.

Construction Intensity. Existing levee work in general is considered low to moderately intensive construction work. New levee work and vibratory equipment for sheet pile is likely classified as moderately intense construction work. Impact hammer use for sheet pile work would be considered high intensity construction work. It has not been uncommon for the Corps to issue construction specifications requiring vibration monitoring associated with the use of impact hammers.

3.7.2 Temporary and Permanent Easements

Table 4 identifies total area for the construction footprint, and for construction and O&M easements for the Recommended Plan. The construction footprint includes the footprint of the existing levee plus the waterside and landside easements. The easements identified in Table 4 are permanent easements. They will be used during construction and maintained permanently for O&M.

Table 4. Construction Footprint (Structural Features) and Construction and O&M Easements

Construction and Easement	Recommended Plan
Construction footprint	158 acres
Waterside 15-foot easement	42 acres
Landside 15-foot easement[1]	56 acres
New levee easement	2.5 acres

[1] Note that the minimum landside easement for existing federally authorized levees is 10 feet.

Construction Easements

Access to the levee toe would be provided in all areas where construction is occurring on the levees. Either a 10 foot (minimum) or a 15 foot (maximum) landside access easement would be provided wherever levee remediation is completed as a result of this project.

Calaveras and Mosher Slough. Levee strengthening along portions of lower Calaveras and Mosher Slough will likely not be able to seek sufficient additional temporary work area easements (TWAE) due to land constraints from existing development. Much of the work to be provided will require that mobilizations and stockpiling occur at offsite temporary staging areas that are as-yet unknown.

Any opportunities to obtain TWAE will likely be sought as currently the permanent easement is only 10-feet from the landside toe of the levee, which is expected to be insufficient. Depending on the type of construction work, the total easement required during construction could be between 20 and 30 feet. If the project is authorized and funded by Congress, additional design work during PED will clarify the easement requirements. Permanent easements will be necessary for those areas where a levee raise is planned due to the effect of pushing the landside toe out when requiring proper geometric shaping.

O&M Easements

For levees that are currently part of the federally authorized flood risk management project, a minimum permanent landside toe clear access easement of 10 feet is required. For levees that are being brought into the federally authorized project as a result of the Recommended Plan, a minimum permanent landside toe clear access easement of 15 feet is required. For both new and existing levees in the LSJRFS a minimum permanent waterside easement of 15 feet is required.

3.8 Post-Construction Operation and Maintenance

3.8.1 O& M Manual

Once project construction is complete, the project would be turned over to the non-Federal sponsor with an O&M manual in accordance with the executed project partnership agreement for construction. The project partnership agreement is signed before construction begins. Following construction, the non-Federal sponsor would then be responsible for the continued O&M of the project consistent with the new and/or amended O&M manuals which are also referred to as Operation, Maintenance, Repair, Replacement and Rehabilitation (OMRR&R) Manuals. The O&M Manuals specify the requirements for operating and maintaining the project.

The portion of the O&M manual that has been amended will be shared with the USFWS and NMFS for review and comment prior to being finalized to ensure the Corps is properly incorporating the terms and conditions of any Biological Opinions. The Corps will continue to coordinate and consult with the USFWS and NMFS to further develop endangered and threatened species avoidance measures for inclusion in the amended O&M manuals.

3.8.2 O&M Easements

See Section 3.7.2 for a description of the required O&M Easements.

3.8.3 O&M of the Recommended Plan

Levees – Including the following structural flood risk reduction measures listed above: Cutoff Walls, Levee Slope Reshaping, Seismic Remediation, Levee Raises, New Levees, Erosion Protection, and Jet Grouting

In general, the levees should be maintained to the as-built condition in perpetuity or as long as the project partnership agreement is in effect. This means that the levee should maintain a consistent shape, side slopes, height, and composition to when the levee is constructed. If the levee settles to a lower height or the slopes of the levee slough causing a loss or material and steepened slopes, the non-federal sponsor is expected to return the levee to the as-built lines and grade. If the levee erodes due to water moving across the face of the levee or wind and wave run-up, the levee should be restored to the as-built condition and the slope protected against future erosion with stone (rip-rap) or other means. Holes or burrows into the levee caused by animals should be properly backfilled and measures should be taken to exterminate burrowing animals. The vegetation on the levee should be maintained as proposed in Section 3.3 of this Assessment. The grasses on the slopes and easement area should be maintained to 12" in height or less, unless covered by an approved variance, to allow visibility and accessibility of the levee slope and toes.

Access roads to and along the levee as well as the levee crown should be maintained to the as-built condition ensuring that the crown is sloped to drain and the access roads are sloped to prevent ponding against the levee allowing all-weather access to the crown and access roads. The non-federal sponsor will be responsible for making sure encroachments are not occurring within the right of way of the project that might endanger the efficient functioning of the levee. Lastly, the cutoff walls, jet grouting, and seismic remediation measures will be installed within the levee section and sometimes deep into the levee foundation. These features will not be visible from the ground surface following construction of the proposed project. The operation and maintenance requirements of these features are to ensure the features remain in place and are not penetrated by encroachments or other ground disturbing activities.

Floodwalls

The concept of floodwall maintenance is very similar to the concept of levee maintenance, keep the floodwall in the as-built condition in perpetuity or as long as the project partnership agreement is in effect. The non-federal sponsor should ensure that the floodwall does not settle or shift from its constructed position which could impact the effective height of the wall or the wall's water tight seals. If the concrete cracks, spalls, or has exposed rebar, the wall should be patched or repaired. The vegetation along the wall should be maintained within the project easements similar to method described above for levees to ensure visibility and accessibility to the wall. Erosion near the floodwall and floodwall foundation could threaten the stability of the wall and should be repaired. The eroded area should be restored to the as-built condition and the area protected against future erosion. Lastly, drainage features for the wall should be inspected and properly maintained to ensure they are in good working order. This includes any pipes through the levee as well as drainage features for the wall itself.

Closure Structures

Overview. Two closure structures would be constructed as part of the Recommended Plan. One would be located on Fourteenmile Slough and one would be on Smith Canal. The gates will be open except during routine maintenance, flood events, and high tides. Typically, the gates would be operated (closed) under specific conditions during the rainy season and during times when high tides occur in the area. Generally the rainy season and high tides will be between November 1st and April 30th.

High Tides. The gates will be operated (closed) when the high tide is forecast to reach or exceed 8.0 ft+ NAVD88 to prevent high flows from entering the canal/slough. The gate would be closed at the lowest tide, prior to a forecasted high tide (8.0 ft+), and remain closed until the high tide begins to recede. The gate would then be opened to allow any accumulated interior drainage behind the gate structure to flow out. This would limit the level and duration of water saturation and reduce the risk of levee damage or failure. Tidal influence would require that the gate be closed from 6 to 12 hours per high tide event. A high tide event is expected on average approximately 10 times per month for January and February. In the unlikely event that high tide reaches 8.0 ft twice in a day, the gate would remain closed for more than 24 hours. The data that was reviewed didn't show a twice daily tide of 8.0 ft or higher. However, it does appear possible that potentially every few years, independent of storm events, one persistent high tide occurrence would require that the gate be closed for more than 24 hours.

High Tide in Combination with Rain/Snow Flood Events. When a rain or snow caused flood event coincides with a high tide, gate closure could last from a few days to a few weeks. Closure duration would depend upon the river conditions and would only occur when water surface elevations exceed 8.0 ft (for reference, the 100-yr elevation is 9.4 ft and the 200-yr elevation is 9.5 ft). In summary, expected flood events are anticipated to require that the gates be closed on average three times a year from a few days to a few weeks long based on the last 20 years of record.

Emergency. One or both of these gates could also be closed indefinitely in case of a levee failure east of the levees for the area the gates are intended to protect.

Maintenance. Maintenance requirements would include exercising each gate briefly (closed and immediately opened) once or twice a year for O&M purposes. All routine maintenance of the motors, gears, etc. for the gate can be accomplished from above while the gate is in the open position. For major maintenance, the gates can be removed with a barge mounted crane and inspected, repaired, and/or replaced. This would eliminate the need for stop logs across the opening.

3.9 Conservation Measures Including Avoidance, Minimization, and Compensation

3.9.1 Valley Elderberry Longhorn Beetle

Construction Phase

Avoidance and Minimization Measures

The following is a summary of measures based on the *Conservation Guidelines for the Valley Elderberry Longhorn Beetle* (USFWS 1999a (Appendix B). These measures will be implemented to minimize any potential effects on VELB or their habitat, including restoration and maintenance activities, long-term, protection, and compensation if shrubs cannot be avoided.

- When a 100-foot (or wider) buffer is established and maintained around elderberry shrubs, complete avoidance (i.e., no adverse effects) will be assumed.
- Where encroachment on the 100-foot buffer has been approved by the USFWS, a setback of 20 feet from the dripline of each elderberry shrub will be maintained whenever possible.
- During construction activities, all areas to be avoided will be fenced and flagged.
- Contractors will be briefed on the need to avoid damaging elderberry shrubs and the possible penalties for not complying with these requirements.
- Signs will be erected every 50 feet along the edge of the avoidance area, identifying the area as an environmentally sensitive area.
- Any damage done to the buffer area will be restored.
- Buffer areas will continue to be protected after construction.
- No insecticides, herbicides, fertilizers, or other chemicals that might harm the beetle or its host plant will be used in the buffer areas.
- Trimming of elderberry plants may be subject to mitigation measures.

- Elderberry shrubs that cannot be avoided would be transplanted to an appropriate riparian area at least 100 feet from construction activities or to an approved conservation bank.
- If possible, elderberry shrubs would be transplanted during their dormant season (approximately November, after they have lost their leaves, through the first two weeks in February). If transplantation occurs during the growing season, increased mitigation ratios will apply.
- Any areas that receive transplanted elderberry shrubs and elderberry cuttings will be protected in perpetuity.
- The Corps will work to develop and identify off-site compensation areas prior to or concurrent with any take of VELB.
- Management of these lands will include all measures specified in USFWS's conservation guidelines (1999a) related to weed and litter control, fencing, and the placement of signs.
- Monitoring will occur for ten consecutive years or for seven non-consecutive years over a 15 year period. Annual monitoring reports will be submitted to USFWS.
- Off-site areas will be protected in perpetuity and have a funding source for maintenance (endowment).

<u>Compensation Measures</u>

Compensation for landside and waterside effects to VELB will be addressed in accordance with the VELB Guidelines (USFWS 1999). Shrubs will be removed and transplanted to an approved Conservation Bank for VELB Recovery or to an approved site within the Action Area and outside the levee flootprint. Transplanted shrubs will be moved prior to construction during dormancy, approximately November through the first 2 weeks in February after they lose their leaves. Transplanting during the dormant period will reduce shock to the plant and increase transplantation success. However, transplanted elderberry shrubs may experience stress, a decline in health, or death due to changes in soil, hydrology, microclimate, or associated vegetation. Transplanted elderberry shrubs and compensatory seedlings and associated native plants would be planted at a USFWS and Corps approved site, which could include one or both of the proposed habitat compensation areas described below (see "Proposed Habitat Compensation Sites" subsection below).

Operation and Maintenance Phase

The avoidance, minimization, and compensation measures described here are examples of the types of measures that may be appropriate during the operation and maintenance phase of the project.

<u>Avoidance and Minimization Measures</u>

- When a 100-foot (or wider) buffer is established and maintained around elderberry shrubs, complete avoidance (i.e., no adverse effects) will be assumed.
- Where encroachment on the 100-foot buffer has been approved by the USFWS, a setback of 20 feet from the dripline of each elderberry shrub will be maintained whenever possible.
- During maintenance activities, all areas to be avoided will be fenced and flagged.
- Maintenance personnel will be briefed on the need to avoid damaging elderberry shrubs and the possible penalties for not complying with these requirements.
- Dust control measures shall be implemented when O&M activities take place within 100’ of elderberry shrubs.

Compensation Measures

If elderberry shrubs require trimming during O&M activities, the non-Federal maintaining agencies would plant 1 seedling elderberry and 2 native plants for every 10 existing elderberry shrubs trimmed during operations and maintenance. A USFWS approved off-site area would be identified to receive the compensation plantings.

3.9.2 Giant Garter Snake

Construction Phase

Avoidance and Minimization Measures

The following measures will be implemented to minimize effects on giant garter snake (GGS) habitat that occurs within 200 feet of any construction activity. These measures are based on USFWS guidelines for restoration and standard avoidance measures included as appendices in USFWS (1997).

- Unless approved otherwise by USFWS, construction will be initiated only during the GGS active period (May 1–October 1, when they are able to move away from disturbance).
- Construction personnel will participate in USFWS-approved worker environmental awareness program.
- A GGS survey would be conducted 24 hours prior to construction in potential habitat. Should there be any interruption in work for greater than two weeks; a biologist would survey the project area again no later than 24 hours prior to the restart of work.
- GGS encountered during construction activities will be allowed to move away from construction activities on their own.
- Movement of heavy equipment to and from the construction site will be restricted to established roadways. Stockpiling of construction materials

will be restricted to designated staging areas, which will be located more than 200 feet away from GGS aquatic habitat.

- GGS habitat within 200 feet of construction activities will be designated as an environmentally sensitive area and delineated with signs or fencing. This area will be avoided by all construction personnel.
- If a frac-out is identified, all work will stop, including the recycling of the bentonite fluid. In the event of a frac-out into water, the location and extent of the frac-out will be determined, and the frac-out will be monitored for 4 hours to determine whether the fluid congeals (bentonite will usually harden, effectively sealing the frac-out location).
- USFWS, NMFS, CDFW, and the RWQCB will be notified immediately of any spills and will be consulted regarding clean-up procedures. A Brady barrel will be onsite and used if a frac-out occurs. Containment materials, such as straw bales, also will be onsite prior to and during all operations, and a vacuum truck will be on retainer and available to be operational onsite within notice of 2 hours. The site supervisor will take any necessary follow-up response actions in coordination with agency representatives. The site supervisor will coordinate the mobilization of equipment stored at staging areas (e.g., vacuum trucks) as needed.
- If the frac-out has reached the surface, any material contaminated with bentonite will be removed by hand to a depth of 1-foot, contained, and properly disposed of, as required by law. The drilling contractor will be responsible for ensuring that the bentonite is either properly disposed of at an approved Class II disposal facility or properly recycled in an approved manner.

Compensation Measures

As described above under “Avoidance and Minimization Measures for GGS” compensation for habitat impacts would consist of: (1) working within the snakes’ active period, (2) conducting pre-construction surveys (3) using exclusionary fencing materials. Compensation to off-set unavoidable effects on GGS upland habitat would be provided at a ratio of 1:1 at a USFWS-approved site. USFWS compensation ratios state that permanent impacts to aquatic GGS habitat will be replaced at a 3:1 ratio. Project action disturbance would only result in temporary impacts to potential aquatic and upland GGS habitat.

If any GGS habitat is impacted by construction, the following measures would be implemented to compensate for the habitat loss:

- Habitat (including aquatic and upland) temporarily impacted for one season (May 1–October 1) will be restored after construction by applying appropriate erosion control techniques and replanting/seeding with appropriate native plants.
- Aquatic habitat permanently impacted will be replaced at a 3:1 ratio.
- Upland habitat permanently impacted will be replaced at a 1:1 ratio.

- Habitat permanently or temporarily impacted outside of the May 1-October 1 work window will be created at a 2:1 ratio.
- The Corps will work to develop appropriate mitigation prior to or concurrent with any disturbance of GGS habitat. Habitat will be protected in perpetuity and have an endowment attached for management and maintenance.

Permanent impacts to GGS habitat within the construction area would be compensated by purchasing bank credits from a USFWS and Corps approved conservation bank per an agreed upon compensation ratio.

Operation and Maintenance Phase

The avoidance, minimization, and compensation measures described here are examples of the types of measures that may be appropriate during the operation and maintenance phase of the project.

<u>Avoidance and Minimization Measures</u>

- O&M activities would occur between May 1 and October 1 during the snake's active season to minimize impacts to the species.
- Construction personnel will participate in USFWS-approved worker environmental awareness program.
- A GGS survey would be conducted 24 hours prior to O&M activities in potential habitat. Should there be any interruption in work for greater than two weeks; a biologist would survey the project area again no later than 24 hours prior to the restart of work.
- GGS encountered during O&M activities will be allowed to move away from construction activities on their own.
- Movement of heavy equipment to and from the construction site will be restricted to established roadways. Stockpiling of construction materials will be restricted to designated staging areas, which will be located more than 200 feet away from GGS aquatic habitat.

3.9.3 Fish

Avoidance and Minimization Measures

- Implement best management practices (BMPs) to prevent slurry seeping out to river and require piping system on land side only.
- Stockpile construction materials such as portable equipment, vehicles, and supplies, at designated construction staging areas and barges, exclusive of any riparian and wetlands areas.
- Stockpile all liquid chemicals and supplies at a designated impermeable membrane fuel and refueling station with a 110% containment system.

- Implement erosion control measures (BMPs) including Storm Water Pollution Prevention Program and Water Pollution Control Program that minimize soil or sediment from entering the river. Install and monitor BMPs for effectiveness, and maintain BMPs throughout construction operations to minimize effects to federally listed fish and their designated critical habitat.
- Schedule construction when listed terrestrial and aquatic species would be least likely to occur in the project area. If construction needs to extend into the timeframe that species are present, coordinate with the resource agencies.
- Limit site access to the smallest area possible in order to minimize disturbance.
- Remove litter, debris, unused materials, equipment, and supplies from the project area daily. Deposit such materials or waste at an appropriate disposal or storage site.
- Immediately (within 24 hours) clean up and report any spills of hazardous materials to the resource agencies. Report any such spills, and the success of the efforts to clean them up, in post-construction compliance reports.
- Designate a Corps-appointed representative as the point-of-contact for any contractor who might incidentally take a living, or find a dead, injured, or entrapped, threatened or endangered species. Identify this representative to the employees and contractors during an all employee education program conducted by the Corps.
- Screen any water pump intakes, as specified by NMFS and USFWS screening specifications. Water pumps will maintain flows to keep approach velocity at the pump screens at 0.2 feet per second or less when working in areas that may support delta smelt or juvenile salmonids.

Additional Minimization and Conservation Measures

To further avoid and minimize project effects on listed species and their critical habitat the Corps will pursue the following additional measures during PED and prior to construction:

- Evaluate the suitability of the levees for an ETL 1110-2-583 vegetation variance. Where suitable, pursue a vegetation variance that would allow woody vegetation to remain on the lower waterside portion of the levee and within the 15’ waterside vegetation-free zone (where removal is not otherwise required for construction of the levee improvements, floodwall, or closure structures).
- Develop the information necessary to evaluate the feasibility of establishing SRA and shallow water habitat compensatory mitigation outside of the vegetation-free zone (or within it if a vegetation variance is approved) along the Lower Calaveras River.
- Minimize vegetation removal to the extent feasible.
- Minimize, to the extent possible, grubbing and contouring activities.

- Identify all habitats containing, or with a substantial possibility of containing, listed terrestrial, wetland, and plant species in the potentially affected project areas. To the extent practicable efforts will be made to minimize effects by modifying engineering design to avoid potential direct and indirect effects.
- Incorporate sensitive habitat information into project bid specifications.
- Incorporate requirements for contractors to avoid identified sensitive habitats into project bid specifications.

Compensation Measures

Vegetation losses have been roughly estimated at 9 acres of woodland riparian and approximately 20,000 lf of SRA habitat (see Table E-3 in Appendix E). To mitigate for the losses of potential SRA and woodland riparian habitat, the Corps shall purchase shaded-riverine credits and floodplain mosaic wetlands (riparian) credits from Cosumnes Floodplain Mitigation Bank. During PED designs will be refined and specific surveys will be conducted to more accurately quantify losses of habitat and determine appropriate mitigation for them.

To mitigate for 1 acre of permanent open water impact and 3 acres of temporary open water impact associated with construction of closure structures on Fourteenmile Slough and Smith Canal, the Corps will purchase 2 credits (acres) of floodplain mosaic wetland. Cosumnes Floodplain Mitigation Bank is approved under the 2008 Compensatory Wetland Mitigation Rule and has the appropriate credits available. This mitigation bank is located in Sacramento County and has been approved by the Corps, USEPA, NOAA Fisheries and the California Department of Fish and Wildlife to provide SRA habitat credits with a service area that includes the LSJRFS project area.

The closure structures on Smith Canal and Fourteenmile Slough would restrict Delta smelt access to potential shallow water habitat about once every 3 years when the high tide is forecast to reach, or exceed +8.00 ft NAVD88. The gates would remain closed for one or two days. The gates may close and open repeatedly during a few days to a few weeks if the high tide conditions persist. The problematic high tides are anticipated to occur between November 1 and April 30. To off-set recurring temporary impacts on Delta smelt due to restricted access to 120 acres of potential shallow water habitat in Tenmile Slough and Smith Canal the Corps will purchase 120 acres of credit from a Service-approved conservation bank. Wildlands, Inc. currently has Delta smelt credits available in banks whose service areas cover the LSJRFS project area.

4.0 STATUS OF FEDERALLY PROTECTED SPECIES AND CRITICAL HABITAT

Federally protected species and critical habitat that may be affected by the proposed action within the LSJRFS study area were determined through consultation with USFWS and NMFS.

4.1 Plants

Federally-listed plant species are associated with habitat such as remnant Great Valley cottonwood riparian forest, Great Valley oak riparian forest, coastal and freshwater marsh. Due to the general lack of supporting habitat, the high level of anthropogenic disturbance throughout the project area, and, thus, the low likelihood of presence in the project area, potential impacts to federally listed plants are not considered in this BA.

4.2 Invertebrates

Most invertebrate species with the potential to occur in or near the LSJRFS study area are associated with vernal pool habitat that are not present on or adjacent to the proposed levee improvements, new levees, or closure structures. Vernal pool habitat may be present within 25 miles of the structural flood risk management features proposed as part of this project. It is anticipated that borrow sites would be located within this 25-mile radius. All sensitive habitat areas, including vernal pools, would be avoided when identifying borrow sites. However, if future studies identify vernal pool habitat in the LSJRFS project area, the Corps will consult with the resource agencies. The only Federally protected invertebrate species that has a high potential to be affected by the project is the VELB.

4.2.1 Valley Elderberry Longhorn Beetle

Status and Distribution

The VELB is listed as a threatened species under the ESA (USFWS 1980). USFWS has undertaken a comprehensive study, known as a 12-month review, to determine whether or not to propose the beetle for delisting (USFWS 2011). According to the USFWS, delisting may be warranted because many new locations of the beetle have been identified since its listing, destruction of habitat has slowed greatly, and efforts have resulted in the protection of significant acreage of habitat (Talley et al. 2006).

The VELB range extends from southern Shasta County to Fresno County (Talley et al. 2006). Along the eastern edge of the species' range, adult beetles have been found in the foothills of the Sierra Nevada at elevations up to 2,220 feet, and beetle exit holes have been located on elderberry plants at elevations up to 2,940 feet. Along the western edge of the species' range, adult beetles have been found on the eastern slopes of the Coast Ranges at elevations of up to 500 feet, and beetle exit holes have been detected on elderberry plants at elevations up to 730 feet (Barr 1991).

Critical habitat for the VELB occurs in two locations near the city of Sacramento (USFWS 1980). The project action area does not occur in critical habitat for the VELB.

Life History and Habitat Requirements

Because historic loss of riparian habitat in the study area has already occurred, the rate of riparian habitat loss has slowed significantly over the last 30 years. During this period, incidental take of habitat has been authorized primarily for urbanization, transportation, water management, and flood control, on the order of 10,000 to 20,000 acres. Several habitat conservation plans are being developed to allow for continued urbanization of the Sacramento Valley (Talley et al. 2006).

Approximately 50,000 acres of existing riparian habitat in the Central Valley, primarily in the Sacramento Valley, have been protected by Federal, State, and local agencies as well as private organizations. Within the study area, large parcels of suitable habitat for the VELB have been protected in the Sacramento River National Wildlife Refuge, along the American River Parkway, and in the lower Cosumnes River watershed, much of which is owned by The Nature Conservancy. Additionally, restoration of more than 5,000 acres of habitat has been initiated throughout the beetle's range (Talley et al. 2006). Mitigation for previous Corps projects has planted within the American River Parkway through agreements with Sacramento County Parks. Additional lands are currently available for mitigation that may be required for this project.

VELB is only found in close association with its host plant, elderberry shrubs (*Sambucus* spp.). Elderberry shrubs are found in or near riparian and oak woodland habitats. The VELB life history is assumed to follow a sequence of events similar to those of related taxa. Female beetles deposit eggs in crevices in the bark of living elderberry shrubs. Presumably, the eggs hatch shortly after they are laid, and the larvae bore into the pith of the trunk or stem. When larvae are ready to pupate, they move through the pith of the plant, open an emergence hole through the bark, and return to the pith for pupation. Adults exit through the emergence holes and can sometimes be found on elderberry foliage, flowers, or stems or on adjacent vegetation. The entire life cycle of the VELB is thought to encompass 2 years, from the time eggs are laid and hatch until adults emerge and die (USFWS 1984).

The presence of exit holes in elderberry stems indicates previous VELB habitat use. Exit holes are cylindrical and approximately 0.25 inch in diameter. Exit holes can be found on stems that are 1 or more inches in diameter. The holes may be located on the stems from a few inches to about 9 to 10 feet above the ground (Barr 1991).

Factors Affecting Abundance

The VELB distribution decline is most likely related to the extensive loss of riparian forests in the Central Valley, which has reduced the amount of available habitat for the species, and has most likely decreased and fragmented the species' range (USFWS 1984).

Insecticide drift from cultivated fields and orchards adjacent to elderberry plants may affect VELB populations, if drift occurs at a time when adults are present on the shrubs (Barr 1991). Herbicide drift from agricultural fields and orchards can likewise affect the health of elderberry plants, thereby reducing their quantity and quality as VELB habitat.

The invasive Argentine ant (*Linepithema humile*) has been spreading in riparian habitats and may affect survival of the VELB. Argentine ants may predate VELB eggs although this interaction needs further exploration (Huxel 2000). The spread of invasive exotic plants (e.g., giant reed [*Arundo donax*] may also negatively affect the VELB by affecting supporting riparian habitats. The presence of giant reed promotes a more frequent fire cycle and homogenous plant community (Talley et al. 2006).

4.3 Amphibians

Amphibians are generally associated with smaller creeks, lentic habitats, and/or vernal pools. These aquatic habitats are generally not found along the Recommended Plan project reaches or in adjacent areas; therefore, listed amphibians are not considered further in this BA.

4.4 Reptiles

One protected reptile species was identified in USFWS database records; the GGS (*Thamnophis gigas*). Potential project effects on this species are addressed in this BA.

4.4.1 Giant Garter Snake

Status and Distribution

The GGS (*Thamnophis gigas*) is federally listed as a threatened species under the ESA. Currently, this species is only known from 13 isolated population clusters within the Central Valley, from Chico to an area southwest of Fresno (USFWS 1997). GGS populations may occur within the LSJRFS study area in and adjacent to the San Joaquin River, Lower San Joaquin River, and Lower Calaveras River.

Life History

The GGS inhabits agricultural wetlands and associated waterways, including irrigation and drainage canals, rice fields, marshes, sloughs, ponds, low-gradient streams, and adjacent uplands. They have also been observed using revetment as cover (Wylie et al. 2002). GGS are believed to be most numerous in rice-growing regions (USFWS 1999b). The snakes are typically absent from the larger rivers; wetlands with sand, gravel, or rock substrates; and riparian areas lacking suitable basking sites or suitable prey populations (Hansen and Brode 1980; Brode 1988; USFWS 1999b). Habitually, the GGS hibernates from October to March in abandoned burrows of small mammals located above prevailing flood elevations (Fisher et al. 1994), and breeds during March and April.

Factors Affecting Abundance

GGS have been reduced in distribution and abundance due to habitat loss and degradation throughout the Central Valley. Several factors may degrade habitat for GGS, including upstream watershed modifications, water storage and diversion projects, and urban and agricultural development. Contamination from agricultural runoff may also have detrimental effects. On-going agricultural practices such as tilling, grading, harvesting and operation of other equipment may also result in mortality and increased rates of predation. Clearing and maintenance of irrigation canals and draining of rice fields may also result in mortality and degradation of habitat (USFWS 1999b).

4.5 Fish Overview

Over the past few decades, multiple fish species have experienced population declines due to natural and anthropogenic factors. Such factors include blockage from suitable spawning and rearing habitat, unsuitable water temperatures, entrainment in unscreened diversion structures, predation, and harvest. Table 5 displays the life stage timing and distribution of listed fish species potentially affected in the action area. The following Federally listed species have the potential to occur in the vicinity of the project areas and could be affected by construction activities:

- sDPS of North American green sturgeon (*Acipenser medirostris*) (Federally Threatened) and critical habitat;
- Delta smelt (*Hypomesus transpacificus*) (Federally Threatened) and critical habitat;
- Central Valley steelhead (*Oncorhynchus mykiss*) (Federally Threatened) and critical habitat;
- Central Valley fall/late fall–run Chinook *salmon as a species of c*oncern (*Oncorhynchus tschawytcha*)

Table 5: Life Stage Timing and Distribution of Federally Listed Fish Species and Pacific Coast Salmon

Species/ Life Stage	Distribution	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Late Fall–Run Chinook Salmon													
Adult migration	S.F. Bay to Upper Sacramento-San Joaquin River's and Tributaries												
Juvenile movement and rearing	Upper Sacramento-San Joaquin River's and Tributaries												
Fall-Run Chinook Salmon													
Adult migration and holding	S.F. Bay to Upper Sacramento-San Joaquin River's and Tributaries												
Juvenile movement	Upper Sacramento-San Joaquin River's and Tributaries to S.F. Bay												
Steelhead													
Adult migration	S.F. Bay to Upper Sacramento-San Joaquin River's and Tributaries												
Juvenile and smolt movement	Upper Sacramento-San Joaquin River's and Tributaries to S.F. Bay												
Green Sturgeon													
Adult migration and holding	S.F. Bay to Upper Sacramento River												
Juvenile rearing (natal stream to estuary)	Upper Sacramento River to S.F. Bay												
Juvenile movement and rearing	Upper Sacramento River to S.F. Bay												
Delta Smelt													
Adult migration	South Delta to North Delta and Lower Sacramento River												
Spawning	Upper Delta to Lower Sacramento River												

Sources: Wang and Brown 1993; U.S. Fish and Wildlife Service 1996; McEwan 2001; Moyle 2002; Hallock 1989; Beamesderfer et al. 2006.

4.5.1 Central Valley Fall- /Late Fall-Run Chinook Salmon Evolutionarily Significant Unit

Status and Distribution

The Central Valley fall-/late fall–run Chinook salmon ESU (*Oncorhynchus tshawytscha*) is not listed under the Federal ESA. On March 9, 1998, NMFS issued a proposed rule to list fall-run Chinook salmon as threatened (NMFS 1998a). However, on September 16, 1999, NMFS determined that the species did not warrant listing (NMFS 1999). On April 15, 2004, NMFS classified Central Valley fall-/late fall–run Chinook salmon as a species of concern (NMFS 2004). However, EFH is designated for this species.

The Central Valley fall-/late fall–run Chinook salmon ESU includes all naturally spawned populations of fall-run Chinook salmon in the Sacramento and San Joaquin river basins and their tributaries. Central Valley fall-/late fall–run Chinook salmon are currently the most abundant and widespread salmon runs in California (Mills et al. 1997). The average escapement in-river on the Sacramento and San Joaquin system from 1960 to 2010 was 231,009 (CDFW 2013).

Life History

Adult fall-run Chinook salmon migrate into the San Joaquin River and its tributaries from June through December in mature condition and spawn from late September through December, soon after arriving at their spawning grounds (Yoshiyama et al. 1998). The spawning peak occurs in October and November. Emergence occurs from December through March, and juveniles migrate downstream to the ocean soon after emerging, rearing in fresh water for only a few months. Smolt outmigration typically occurs from March through July (Yoshiyama et al. 1998).

Late fall-run Chinook salmon migrate upstream before they are sexually mature, and hold near spawning grounds for 1 to 3 months before spawning. Upstream migration takes place from October through April and spawning occurs from late January through April, with peak spawning in February and March (Yoshiyama et al. 1998). Fry emerge from April through June. Juvenile late fall-run Chinook salmon rear in their natal streams during the summer and in some streams they remain throughout the year. Smolt outmigration can occur from November through May (Yoshiyama et al. 1998).

Factors Affecting Abundance

Factors affecting abundance of fall-/late fall-run Chinook salmon are similar to factors affecting abundance of winter- and spring-run Chinook salmon, i.e., habitat loss and degradation. Fall-run Chinook salmon, however, typically use spawning habitat farther downstream than the spawning habitat used by spring- and winter-run Chinook salmon. The effect of dams on spawning habitat area for fall-run Chinook salmon is not as severe as for other runs, although access to substantial spawning habitat area has been blocked by dams.

San Joaquin River tributary (Consumnes, Mokelumne, Stanislaus, Tuolumne, and Merced Rivers) and hatchery (Mokelumne River and Merced River Fish Facility) fall-run Chinook salmon escapement from 1952-2010 has seen a boom or bust cycle with peaks of escapement in 1953 (84,000), 1960 (57,255), 1969 (52,212), 1985 (77,749), and most recently in 2000 (47,330). Low escapement years included 1956 (12,174), 1962 (1,755), 1977 (1,711), 1991 (1,000), and most recently in 2008 (2,656). If the trend continues we could expect the numbers to increase to a peak and continue the boom and bust cycle (Figure 10). Hatchery escapement from 1964-2008 was lower than the tributary escapement, however, in 2009 and 2010 hatchery escapement has surpassed tributary escapement numbers for the first time since 1964 (GrandTab 2013).

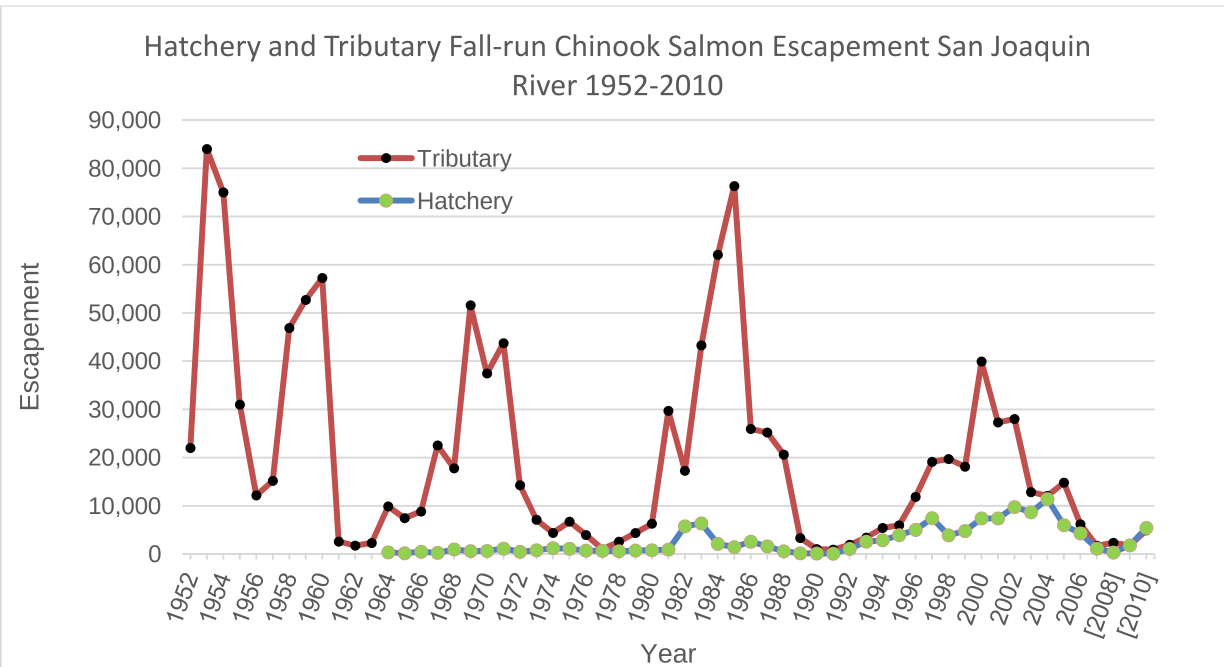


Figure 10. San Joaquin River Tributary and Hatchery Fall-run Chinook Salmon Escapement 1952-2010.

Critical Habitat/EFH

Critical habitat is not designated for fall-/late fall-run Chinook salmon. EFH is defined as those waters and substrate necessary for spawning, breeding, feeding, or growth to maturity. EFH includes currently and historically accessible habitat. All levee reaches within the project area are considered to be EFH for fall-/late fall-run Chinook salmon.

4.5.2 Central Valley Steelhead Distinct Population Segment

Status and Distribution

The Central Valley steelhead (*Oncorhynchus mykiss*) DPS was federally listed as threatened on March 19, 1998 (NMFS 1998). The threatened status of Central Valley steelhead was reaffirmed in NMFS's final listing determination on January 5, 2006 (NMFS 2006a). At that time NMFS also adopted the term DPS, in place of ESU, to describe Central Valley steelhead and other population segments of this species. NMFS originally designated critical habitat for Central Valley steelhead on February 16, 2000 (NMFS 2000). However, following a lawsuit (*National Association of Home Builders et al. v. Donald L. Evans, Secretary of Commerce, et al.*), NMFS decided to rescind the listing and re-evaluate how to classify critical habitat for several DPSs of steelhead.

Critical habitat for Central Valley steelhead was re-designated by NMFS on September 2, 2005 (NMFS 2005b). The DPS includes all naturally spawned populations of steelhead in the Sacramento and San Joaquin rivers and their tributaries, excluding steelhead from San Francisco and San Pablo Bays and their tributaries. The designated critical habitat for Central Valley steelhead in the San Joaquin River Basin include the Mokelumne, Calaveras, Stanislaus, Tuolumne, and Merced Rivers. On August 15, 2011, NMFS completed the 5-year status review of Central Valley steelhead and recommended that Central Valley steelhead DPS remain classified as a threatened species. Currently, Central Valley steelhead DPS and critical habitat extends from the San Joaquin River to the confluence with the Merced River (NMFS 2011, as cited in USBR 2013).

Potential routes to spawning habitats for migratory fish such as the Central Valley steelhead (*Oncorhynchus mykiss*) are believed to have been historically unhindered in the San Joaquin River before completion of the Friant Dam. Although little detailed information on steelhead distribution and abundance is available (Lindley *et al.* 2006, McEwan 2001, as cited in USBR 2013), they are mostly distributed higher in watersheds with large river systems than Chinook salmon (*Oncorhynchus tshawytscha*) (Voight and Gale 1998, as cited in McEwan 2001). Therefore, steelhead may have spawned at least as far upstream as the natural barrier located at the present-day site of Mammoth Pool and the upper reaches of San Joaquin River tributaries. Modeling of potential steelhead habitat (Lindley *et al.* 2006, as cited in USBR 2013) suggests that a portion of the upper San Joaquin River basin historically supported an independent steelhead population. However, much of the habitat downstream from this population's modeled distribution may have been unsuitable for rearing because of high summer water temperatures. Lindley *et al. (*2006, as cited in USBR 2013) concluded that suitable steelhead habitat existed historically in all major San Joaquin River tributaries, although to a lesser degree than in stream systems in the Cascades, Coast Range, and Northern Sierra Nevada. Additionally, steelhead are historically documented in the Tuolumne and Kings River systems (McEwan 2001, as cited in USBR 2013).

Life History

Central Valley steelhead have one of the most complex life histories of any salmonid species, exhibiting both anadromous and freshwater resident life histories. Freshwater residents typically are referred to as rainbow trout, and those exhibiting an anadromous life history are called steelhead (NMFS 1999). Steelhead exhibit highly variable life history patterns throughout their range but are broadly categorized into winter and summer reproductive ecotypes. Winter steelhead are the most widespread reproductive ecotype and the only type currently present in Central Valley streams (McEwan and Jackson 1996). Winter steelhead become sexually mature in the ocean, enter spawning streams in summer, fall or winter, and spawn a few months later in winter or late spring (Meehan and Bjornn 1991; Behnke 1992).

According to NMFS (2009), steelhead historically occurred naturally throughout the Sacramento and San Joaquin River basins, although stocks have been extirpated from large areas in both basins. The California Advisory Committee on Salmon and Steelhead (CDFG 1988) reported a reduction in Central Valley steelhead habitat from 6,000 miles historically to 300 miles.

NMFS (2009) reported that prior to dam construction, water development and watershed perturbations, Central Valley steelhead were distributed throughout the Sacramento and San Joaquin rivers (Busby et al. 1996; McEwan 2001). Steelhead were found from the upper Sacramento and Pit rivers (now inaccessible due to Shasta and Keswick dams) south to the Kings and possibly the Kern River systems, and in both east- and west-side Sacramento River tributaries (Yoshiyama et al. 1996). Lindley et al. (2006) estimated that historically there were at least 81 independent Central Valley steelhead populations distributed primarily throughout the eastern tributaries of the Sacramento and San Joaquin rivers. Presently, impassable dams block access to 80% of historically available habitat, and block access to all historical spawning habitat for about 38% of historical populations (Lindley et al. 2006). Existing wild steelhead stocks in the Central Valley are mostly confined to the upper Sacramento River and its tributaries, including Antelope Creek, Deer Creek, and Mill Creek, and the Yuba River. Populations may exist in Big Chico and Butte creeks, and a few wild steelhead are produced in the American and Feather rivers (McEwan 2001).

Until recently, steelhead were thought to be extirpated from the San Joaquin River system. Recent monitoring has detected small self-sustaining populations of steelhead in the Stanislaus, Mokelumne, and Calaveras rivers, and other streams previously thought to be devoid of steelhead (McEwan 2001).

It is possible that naturally spawning populations exist in many other streams but are undetected due to lack of monitoring programs (IEP Steelhead Project Work Team 1999, as cited in NMFS 2009). Incidental catches and observations of steelhead juveniles also have occurred on the Tuolumne and Merced Rivers during fall-run Chinook salmon monitoring activities, indicating that steelhead are widespread, throughout accessible streams and rivers in the Central Valley (Good et al. 2005). Naturally spawning populations of steelhead also occur in the Feather, Yuba, American, and Mokelumne rivers, but these populations have had substantial hatchery influence and their ancestries are not clear (Busby et al. 1996). Steelhead runs in the Feather and American rivers are sustained largely by the FRFH and Nimbus Hatchery (McEwan and Jackson 1996). Steelhead also currently occur in the Stanislaus, Calaveras, Merced, and Tuolumne rivers (NMFS 2009).

Historic Central Valley steelhead run sizes are difficult to estimate because of the lack of data, but McEwan (2001) suggested that steelhead run sizes may have approached one to two million adults annually. McEwan and Jackson (1996) suggested that by the early 1960s, the steelhead run size had declined to about 40,000. Over the last 30 years the steelhead populations in the upper Sacramento River have declined substantially (NMFS 2009). In 1996, NMFS estimated the Central Valley total run size based on dam counts, hatchery returns, and past spawning surveys was probably fewer than 10,000 fish. Both natural and hatchery runs have declined since the 1960s. Counts at RBDD averaged 1,400 fish from 1991 to 1996, compared to counts in excess of 10,000 fish in the late 1960s (McEwan and Jackson 1996). American River redd surveys and associated monitoring from 2002 through 2007 indicate that only a few hundred steelhead spawn in the river and a portion of those spawners originated from Nimbus Hatchery (Hannon and Deason 2008).

The lack of sustained monitoring programs for steelhead throughout most of the Central Valley persists to the present time. There is a paucity of reliable data to estimate run sizes of steelhead in the Central Valley, particularly wild stocks. However, some steelhead escapement monitoring surveys have been initiated in upper Sacramento River tributaries (e.g., Beegum, Deer, and Antelope Creeks) using snorkel methods similar to spring-run Chinook escapement surveys (NMFS 2009a).

There is a general lack of steelhead population monitoring in most of the Central Valley (NMFS 2009a). Lindley et al. (2007) stated that there are almost no data with which to assess the status of any of the Central Valley steelhead populations. They further stated that Central Valley steelhead populations are classified as data deficient, with the exceptions restricted to streams with long-running hatchery programs including Battle Creek and the Feather, American and Mokelumne rivers.

According to NMFS (2007a), in the *Updated Status Review of West Coast Salmon and Steelhead* (Good et al. 2005), the Biological Review Team made the following conclusion based on steelhead Chipps Island trawl data:

"If we make the fairly generous assumptions (in the sense of generating large estimates of spawners) that average fecundity is 5,000 eggs per female, 1% of eggs survive to reach Chipps Island, and 181,000 smolts are produced (the 1998-2000 average), about 3,628 female steelhead spawn naturally in the entire Central Valley."

Two to three year-old Central Valley steelhead generally migrate to freshwater (Reynolds 1993). Adults may be present in the San Joaquin River between July and March of the following year, with peak numbers occurring between the months of

December and January (CDFG 2007) when small streams and tributaries are cool and well-oxygenated (Williams 2006). Unlike other salmonids which can only spawn once before death, a percentage of steelhead population (17.2 percent) in California streams can return to the ocean and migrate back upstream to spawn again in subsequent years (Shapolov and Taft 1954).

Factors Affecting Abundance

The decline in steelhead populations is attributable to changes in habitat quality and quantity. The availability of steelhead habitat in the Central Valley has been reduced by as much as 95% or more due to barriers created by dams (NMFS 1996a). Populations have been most severely affected by dams blocking access to the headwaters of all major tributaries; consequently, most runs are maintained through artificial production. The decline of naturally produced Central Valley steelhead has been more precipitous than that of hatchery stocks. Populations in the range's southern portion have experienced the most severe declines (NMFS 1996b). Other factors contributing to the decline of steelhead in the Central Valley are mining, agriculture, urbanization, logging, harvest, hatchery influences, flow management (including reservoir operations), hydropower generation, and water diversion and extraction (NMFS 1996a).

Critical Habitat

Critical habitat for Central Valley steelhead includes the stream channels in the designated stream reaches and the lateral extent as defined by the ordinary high-waterline or bank-full elevation. Critical habitat in the action area includes the San Joaquin River from the confluence of the Stockton DWSC to French Camp Slough, the Calaveras River portion of the action area to the confluence with the Sacramento DWSC, and the Stockton DWSC between the San Joaquin River and Tenmile Slough.

4.5.3 Delta Smelt

Status and Distribution

Delta smelt (*Hypomesus transpacificus*) was Federally-listed as threatened on March 5, 1993 (USFWS 1993). Critical habitat was designated on December 19, 1994 (USFWS 1994). Population trends and abundance of delta smelt are poorly understood due to their short life span (1 year). Based on data from 21 years of monthly sampling in Suisun Marsh, delta smelt appear to be experiencing long-term declines (Matern et al. 2002). Summer tow-net and fall/mid-water trawl data show fluctuating annual abundance from 1991 through 1996, with an increasing trend in the late 1990s, followed by an overall decline in abundance since 1999 (Bryant and Souza 2004).

Life History

Delta smelt are endemic to the Sacramento-San Joaquin estuary and are found seasonally in Suisun Bay and Suisun Marsh. Historically, the upstream limits of their range have been the upper limits of the delta (Sacramento on the Sacramento River and Mossdale on the San Joaquin River). The lower limit is the western Suisun Bay (Radtke 1966; Moyle 1976, as cited in Moyle et al. 1992). Delta smelt are typically found in shallow water (less than 10 feet) where salinity ranges from 2 to 7 parts per thousand (ppt), although they have been observed at salinities between 0 and 18.4 ppt. Delta smelt have relatively low fecundity and most live for 1 year. They feed on planktonic copepods, cladocerans, amphipods, and insect larva (Moyle 2002).

Delta smelt are semi-anadromous. During their spawning migration, adults move into the freshwater channels and sloughs of the Delta between December and January. Spawning occurs between January and July, with peak spawning from April through mid-May (Moyle 2002). Spawning locations in the Delta have not been identified and are inferred from larval catches (Bennett 2005). Larval fish have been observed in: Montezuma Slough; Suisun Slough in Suisun Marsh; the Napa River estuary; the Sacramento River above Rio Vista; and Cache, Lindsey, Georgiana, Prospect, Beaver, Hog, Sycamore, and Barker sloughs (Wang 1986; Moyle 2002; Stillwater Sciences 2006; and USFWS 1996). Spawning was also observed in the Sacramento River up to Garcia Bend (RM 51) during drought conditions, as a result of increased saltwater intrusion that moved delta smelt spawning and rearing farther inland (Wang and Brown 1993).

Laboratory experiments have found eggs to be adhesive, demersal, and usually attached to substrate composed of gravel, sand, or other submerged material (Moyle 2002, Wang 1991). Hatching takes approximately 9 to 13 days, and larvae begin feeding 4 to 5 days later. Newly hatched larvae contain a large oil globule that makes them semi-buoyant and allows them to stay near the bottom. As their fins and swim bladder develop, they move higher into the water column and are transported downstream to the open waters of the estuary (Moyle 2002).

Factors Affecting Abundance

Diversions and Delta inflow and outflow may affect survival of delta smelt. In water exported at the South Delta CVP and SWP export facilities, estimates of delta smelt entrainment suggest a population decline in the early 1980s, mirroring the decline indicated by mid-water trawl, summer tow-net, Kodiak trawl, and beach seine data (Bennett 2005). Diversions and upstream storage, including operation of the CVP and SWP, control Delta inflow and outflow during most months. Reduced Delta flow may inhibit or slow movement of larvae and juveniles to estuarine rearing habitat and into deeper and narrower channels of the Delta, resulting in lower prey availability and increased mortality from predators (Moyle 2002). Low Delta flow also may increase entrainment in diversions, including entrainment at the CVP and SWP export pumps (Moyle 2002). Additional factors affecting delta smelt abundance include extremely high river outflow that increases entrainment at export facilities, changes in prey abundance and composition, predation by nonnative species, toxic substances, disease, and loss of genetic integrity through interbreeding with the introduced Wagasaki smelt (Moyle 2002; CDFG 2000; Bennett 2005).

Critical Habitat

Critical habitat for delta smelt consists of all water and all submerged lands below ordinary high water and the entire water column bounded by and contained in: Suisun Bay (including the contiguous Grizzly and Honker bays); the length of Goodyear, Suisun, Cutoff, First Mallard (Spring Branch), and Montezuma sloughs; and the contiguous waters in the Delta (USFWS 1994). Critical habitat for delta smelt is designated in the following California counties: Alameda, Contra Costa, Sacramento, San Joaquin, Solano, and Yolo (USFWS 2003). Primary constituent elements of critical habitat determined to be essential to the conservation of the species include physical habitat, water, river flow, and salinity concentrations required to maintain delta smelt habitat for spawning, larval and juvenile transport, rearing, and adult migration (USFWS 2006a).

In determining which areas to designate as critical habitat, USFWS considers those physical and biological features that are essential to a species' conservation (50 CFR 424.12[b]). USFWS is required to list the known primary constituent elements together with a description of any critical habitat that is proposed. Such physical and biological features (i.e., primary constituent elements) include, but are not limited to, the following:

- Space for individual and population growth, and for normal behavior;
- Food, water, air, light, minerals, or other nutritional or physiological requirements;
- Cover or shelter;
- Sites for breeding, reproduction, rearing of offspring, germination, or seed dispersal; and
- Generally, habitats that are protected from disturbance or are representative of the historic geographical and ecological distributions of a species.

The primary constituent elements essential to the conservation of the delta smelt are physical habitat, water, river flow, and salinity concentrations required to maintain delta smelt habitat for spawning, larval and juvenile transport, rearing, and adult migration (NMFS 1994a). These elements are described in further detail below.

<u>Spawning Habitat</u>

Delta smelt adults seek shallow, fresh or slightly brackish backwater sloughs and edgewaters for spawning. To ensure egg hatching and larval viability, spawning areas also must provide suitable water quality (i.e., low concentrations of pollutants) and substrates for egg attachment (e.g., submerged tree roots and branches and emergent vegetation). Specific areas that have been identified as important delta smelt spawning habitat include Barker, Lindsey, Cache, Prospect, Georgiana, Beaver, Hog, and Sycamore sloughs and the Sacramento River in the Delta, and tributaries of northern Suisun Bay. The spawning season varies from year to year and may start as early as December and extend until July (NMFS 1994a).

Larval and Juvenile Transport

Once then have hatched, delta smelt larvae move to shallow, productive rearing or nursery habitats. Protection of the Sacramento and San Joaquin Rivers and their tributary channels from physical disturbance and flow disruption is important to successful larval transport and rearing. Adequate river flow is necessary to transport larvae from upstream spawning areas to rearing habitat in Suisun Bay. Additionally, river flow must be adequate to prevent interception of larval transport by the State and Federal water projects and smaller agricultural diversions in the Delta. To ensure that suitable rearing habitat is available in Suisun Bay, the 2 ppt isohaline must be located westward of the Sacramento-San Joaquin River confluence during the period when larvae or juveniles are being transported, according to the historical salinity conditions which vary according to water-year type. Reverse flows that maintain larvae upstream in deep-channel regions of low productivity and expose them to entrainment interfere with these transport requirements. Suitable water quality must be provided so that maturation is not impaired by pollutant concentrations.

The specific geographic area important for larval transport is confined to waters contained within the legal boundary of the Delta, Suisun Bay, and Montezuma Slough and its tributaries. The specific season when habitat conditions identified above are important for successful larval transport varies from year to year, depending on when peak spawning occurs and on the water-year type. USFWS (1994) has identified situations when additional flows might be required in July through August to protect delta smelt that are present in the south and central Delta from being entrained in the State and Federal project pumps, and to avoid jeopardy to the species. The long-term biological opinion on State and Federal water project operations will identify if additional flows may be required after the February through June period identified by the U.S. Environmental Protection Agency (USEPA) for its water quality standards to protect delta smelt in the south and central Delta (NMFS 1994a).

Rearing Habitat

Maintenance of the 2 ppt isohaline according to the historical salinity conditions described above and suitable water quality (low concentrations of pollutants) within the Delta is necessary to provide delta smelt larvae and juveniles a shallow, protective, food-rich environment in which to mature to adulthood. This placement of the 2 ppt isohaline also serves to protect larval, juvenile, and adult delta smelt from entrainment in the State and Federal water projects. An area extending eastward from Carquinez Strait, including Suisun Bay, Grizzly Bay, Honker Bay, Montezuma Slough and its tributary sloughs, up the Sacramento River to its confluence with Three Mile Slough, and south along the San Joaquin River including Big Break, defines the specific geographic area critical to the maintenance of suitable rearing habitat. Three Mile Slough represents the approximate location of the most upstream extent of tidal excursion when the historical salinity conditions described above are implemented. Protection of rearing habitat conditions may be required from the beginning of February through the summer (NMFS 1994a).

Adult Migration

Adult delta require unrestricted access to suitable spawning habitat in a period that may extend from December to July. Adequate flow and suitable water quality may need to be maintained to attract migrating adults in the Sacramento and San Joaquin River channels and their associated tributaries, including Cache and Montezuma sloughs and their tributaries. Protecting these areas from physical disturbance and flow disruption during migratory periods is important (NMFS 1994a).

4.5.4 Green Sturgeon Southern Distinct Population Segment

Status and Distribution

On January 23, 2003, NMFS determined that green sturgeon (*Acipenser medirostris*) are comprised of two populations, a northern and a southern DPS (NMFS 2003). The northern DPS includes populations extending from the Eel River northward, and the southern DPS includes populations south of the Eel River to the Sacramento River. The Sacramento River supports the southernmost spawning population of green sturgeon (Moyle 2002). On April 6, 2005, NMFS determined that the northern DPS does not warrant listing under the ESA, but it remains on the Species of Concern List (NMFS 2005c). On April 7, 2006, NMFS determined that the southern DPS of green sturgeon was threatened under the Federal ESA (NMFS 2006c). On October 9, 2009, NMFS (74 CFR 52300) designated critical habitat for the green sturgeon southern DPS throughout most of its occupied range.

Green sturgeon were classified as a Class 1 Species of Special Concern by California Department of Fish and Wildlife (CDFW) in 1995 (Moyle et al. 1995). Class 1 Species of Special Concern are those that conform to the state definitions of threatened or endangered and could qualify for addition to the official list. On March 20, 2006, emergency green sturgeon regulations were put into effect by CDFW requiring a year-round zero bag limit of green sturgeon in all areas of the state (CDFW 2006).

Life History

The green sturgeon is anadromous, but it is the most marine-oriented of the sturgeon species and has been found in near shore marine waters from Mexico to the Bering Sea (NMFS 2005c). The southern DPS has a single spawning population in the Sacramento River (NMFS 2005d) and more recently spawning has been observed in the lower Feather River, a tributary of the Sacramento River (Seesholtz et al. 2012).

Adults typically migrate upstream into rivers between late February and late July. Spawning occurs from March to July, with peak spawning from mid-April to mid-June. Green sturgeon are believed to spawn every 3 to 5 years, although recent evidence indicates that spawning may be as frequent as every 2 years (NMFS 2005c). Little is known about the specific spawning habitat preferences of green sturgeon. Adult green sturgeon are believed to broadcast their eggs in deep, fast water over large cobble substrate, where the eggs settle into the interstitial spaces (Moyle 2002). Spawning is generally associated with water temperatures from 46 to 57 degrees Fahrenheit (°F). In the Central Valley, spawning occurs in the Sacramento River upstream of Hamilton City, perhaps as far upstream as Keswick Dam (Adams et al. 2002) and the lower Feather River (Seesholtz et al. 2012).

Information regarding green sturgeon distribution in the San Joaquin River was limited to anecdotal reports and California Department of Fish and Wildlife (CDFW) sturgeon report card data. Information regarding sturgeon habitat use and movements throughout the San Joaquin River is lacking, but critical to improve management and protection of these species. Angler fishing report cards document a small sturgeon fishery in the reach of the San Joaquin River upstream of Stockton, California (river kilometer, hereafter rkm, 64). Since implementation of the Sturgeon Report Card in 2007, anglers have reported catching 169 white sturgeon and 6 green sturgeon on the San Joaquin River upstream from Stockton (Gleason et al. 2008; DuBois et al. 2009, 2010, 2011, and 2012, as cited in Jackson, Z. J., and J. P. Van Eenennaam, 2013). Of the reported fish, 108 (64%) white and 5 (83%) green sturgeon were caught between Stockton and the Highway 140 bridge (rkm 202). The remaining 61 (36%) white and 1 (17%) green sturgeon were caught upstream of the Highway 140 bridge. Reports indicated anglers concentrate in two areas known locally as Sturgeon Bend (rkm 119) and Laird Park (rkm 143; H. Rutherford, CDFW warden, personal communication, as cited in Jackson, Z. J., and J. P. Van Eenennaam. 2013). Additionally, anglers and game wardens indicate that sturgeon caught during March and April commonly expel milt or eggs during handling, indicating that spawning could be occurring nearby (Jackson, Z. J., and J. P. Van Eenennaam. 2013).

Green sturgeon eggs hatch in approximately 8 days at 55°F (Moyle 2002). Larvae begin feeding 10 days after hatching. Metamorphosis to the juvenile stage is complete within 45 days of hatching. Juveniles spend 1 to 4 years in fresh and estuarine waters and migrate to salt water at lengths of 300 to 750 millimeters (mm) (NMFS 2005c). Our understanding of juvenile habitat is poorly understood. Juvenile green sturgeon inhabit the Sacramento River and San Francisco Bay-Delta. In the river, they occupy low-light habitats with some rock structure during their first winter. Juveniles have been reported to forage at night, while seeking the darkest available habitats during the day (Kynard 2005 in Israel and Klimley 2008). Juvenile green sturgeon do have morphological and behavioral attributes for holding in flowing riverine environments (Allen et al. 2006a in Israel and Klimley 2008). In the estuary, it is possible that older juvenile green sturgeon are capable of moving across highly variable physical gradients in salinity, temperature, dissolved oxygen as are adults in the ocean environment (Kelly et al. 2007, Moser and Lindley 2007 in Israel and Klimley 2008). Kaufman et al. (2006) found the oxygen binding of green sturgeon juveniles appeared to have low temperature sensitivity, which would permit fishes to bind sufficient oxygen with increased water temperatures. The oxygen binding and uploading responses of juvenile green sturgeon across a range of temperatures between 11^0 and 24^0 C suggests they are capable of inhabiting slightly hypoxic-environments (e.g., when compared to that of rainbow trout) while maintaining moderate aerobic activity (Kaufman et al. 2006). These experimental data also suggested green sturgeon have a limited ability to handle increased environmental $C0_{2.}$ Flow may indirectly influence juvenile foraging and survival by modifying the availability of freshwater and low-salinity habitats in the Delta and Suisun Bay during green sturgeon's first year of life (Israel and Klimley 2008).

Little is known about movements, habitat use, and feeding habits of green sturgeon. Green sturgeon have been salvaged at the state and Federal fish collection facilities in every month, indicating that they are present in the Delta year-round. Juveniles and adults are reported to feed on benthic invertebrates, including shrimp and amphipods, and small fish (NMFS 2005c).

Factors Affecting Abundance

The historical decline of the southern DPS of green sturgeon has been largely attributed to the reduction of spawning habitat area. Keswick and Shasta Dams on the Sacramento River and Oroville Dam on the Feather River are impassable barriers that prevent green sturgeon from accessing what were likely historical spawning grounds upstream of these dams. Other potential migration barriers or impediments include the Sacramento Deep Water Ship Channel locks, Fremont Weir, Sutter Bypass, the Delta Cross Channel, and Shanghai Bench and Sunset Pumps on the Feather River. Other factors that have been identified as potential threats to green sturgeon are reductions in freshwater outflow in the Delta during larval dispersal and rearing, high water temperatures during spawning and incubation, entrainment by water diversions, contaminants, predation and other impacts by introduced species, and poaching (NMFS 2005c).

Critical Habitat

Designated critical habitat for the southern DPS of green sturgeon includes: the Sacramento River downstream of Keswick Dam; the Feather River downstream of Oroville Dam; and the Yuba River downstream of Daguerre Dam; portions of Sutter and Yolo Bypasses; the legal Delta, excluding Five Mile Slough, Seven Mile Slough, Snodgrass Slough, Tom Paine Slough and Trapper Slough; and San Francisco, San Pablo, and Suisun bays. The Stockton DWSC and the San Joaquin River approximately 14,661 lf below Airport Way are also included. Freshwater habitat of green sturgeon of the southern DPS varies in function, depending on location within the Sacramento River watershed. Spawning areas currently are limited to accessible reaches of the Sacramento River upstream of Hamilton City and downstream of Keswick Dam (CDFG

2002). Preferred spawning habitats are thought to contain large cobble in deep and cool pools with turbulent water (CDFG 2002; Moyle 2002; Adams et al. 2002). Sufficient flows are needed to adequately oxygenate and limit disease and fungal infection of recently laid eggs (Deng et al. 2002). Within the Sacramento River, spawning appears to be triggered by large increases in water flow during spawning (Brown and Michniuk 2007).

5.0 ENVIRONMENTAL BASELINE

This section describes the physical conditions and general vegetation, wildlife, and fisheries resources present within the LSJRFS study area. These conditions are first presented generally throughout the LSJRFS study area and then site specific SRA is analyzed as well as affected species in the LSJRFS study area. The environmental baseline provides information necessary to determine if the proposed action would jeopardize the continued existence of species being considered, and if the project can support long-term survival of these species in the study area.

5.1 Hydrology

5.1.1 Sacramento-San Joaquin Delta

The Sacramento-San Joaquin Delta (Delta) extends inland from the confluence of the Sacramento and San Joaquin rivers west of Antioch to Sacramento on the Sacramento River and near Mossdale on the San Joaquin River. The project area is in the southeastern portion of the Delta, within the legal boundary of the Delta as defined by Section 12220 of the California Water Code. The legal Delta encompasses an area of approximately 851,000 acres (of which approximately 135,000 acres consist of waterway, marshland, or other water surfaces). The Delta is divided into a Primary Zone and a Secondary Zone, as defined by the Delta Protection Act of 1992. Land uses in the Primary Zone are regulated to protect the area for agriculture, wildlife habitat, and recreational uses. The Secondary Zone is the area outside the Primary Zone and within the legal Delta. Where urban development activities occur in the Secondary Zone, efforts should be taken to ensure that these activities do not adversely affect Delta waters, Primary Zone habitat, or recreational uses. The San Joaquin River delineates the boundary between the Primary Zone to the west and the Secondary Zone to the east. Accordingly, the Phase 3Project is located in the Secondary Zone.

The Sacramento River contributes roughly 75-80% of the Delta inflow in most years and the San Joaquin River contributes about 10-15%; the Mokelumne, Cosumnes, and Calaveras rivers, which enter into the eastern side of the Delta, contribute the remainder. The rivers flow through the Delta and into Suisun Bay, San Pablo Bay, San Francisco Bay, and the Pacific Ocean. Historical annual Delta inflow averaged approximately 23 million acre-feet (MAF) between 1945 and 1995, with a minimum inflow of approximately 6 MAF in 1977 and a maximum of approximately 70 MAF in 1983. Water flowing into the Delta is used for urban and agricultural use, recreation, navigation, and wildlife and fisheries. The Delta provides drinking water for about 23 million Californians.

Freshwater inflows to the Delta vary greatly, depending on precipitation, snowmelt, and Central Valley Project (CVP) and State Water Project (SWP) water operations. During the summer months, most of the inflow to the Delta comes from regulated releases from SWP and CVP reservoirs. Both of these projects withdraw significant volumes of water from the Delta for agricultural and urban use. Precipitation in the project region occurs primarily during the months of November through March, with the average annual precipitation ranging from about 8 inches near Tracy to approximately 17 inches near Lodi. Near Lathrop, the annual precipitation is approximately 12 inches.

Water movement in the Delta responds to four primary forcing mechanisms: (1) freshwater inflows draining to the ocean; (2) Delta exports and diversions; (3) operation of water control facilities such as dams, export pumps, and flow barriers; and (4) the regular tidal movement of seawater into and out of the Delta. In addition, winds and salinity behavior within the Delta can generate a number of secondary currents that, although of low velocity, can be of considerable significance with respect to transporting contaminants and mixing different sources of water. Changes in flow patterns within the Delta, whether caused by export pumping, winds, atmospheric pressure, flow barriers, tidal variations, inflows, or local diversions, can influence water quality at drinking water intakes.

The Delta is a hydrologically complex region of interlacing channels, marshland, and islands. The Delta has been reclaimed into more than 60 islands and tracts, interlaced with about 700 miles of waterways. Some channels are edged with aquatic and riparian vegetation, but most are bordered by steep banks of earth or rip rapped levees. Vegetation is generally removed from channel margins to increase flood flow capacity and facilitate levee maintenance. About 520,000 acres are devoted to farming. An approximately 1,100-mile network of levees protects the reclaimed land, most of which lies near or below sea level, from flooding. Some of the island interiors are as much as 25 feet below sea level.

5.1.2 San Joaquin River

The San Joaquin River originates in the Sierra Nevada and enters the San Joaquin Valley at Friant Dam. The majority of the flow in the lower San Joaquin River is derived from inflow from the Merced, Tuolumne, and Stanislaus rivers (Northeastern San Joaquin County Groundwater Banking Authority 2004). The 330-mile-long San Joaquin River, which drains a watershed area of 13,540 square miles from the Sierra Nevada to the Sacramento-San Joaquin Delta, contributes approximately 15% of the inflow to the Delta (Delta Protection Commission 2000). Flowing through portions of Fresno, Madera, Merced, Stanislaus, San Joaquin, Sacramento, and Contra Costa counties, the river has flows ranging from 1,500 cubic feet per second (cfs) in dry years to more than 40,000 cfs in wet years (Friant Water Users Authority and Natural Resources Defense Council 2002).

Hydrologic conditions in the San Joaquin River basin are dominated by snowmelt from the Sierra Nevada. Before completion of major water storage projects on the San Joaquin River and its major tributaries, lower San Joaquin River flows generally peaked in late spring/early summer and dropped to low levels in the fall. Since the completion of Friant Dam (1944), McClure Reservoir (1967 on the Merced River), Don Pedro

Reservoir (1971 on the Tuolumne River), and New Melones Reservoir (1979 on the Stanislaus River), the lower San Joaquin River seasonal flow pattern has been significantly altered. Before 1944, based on 1923–1944 records, the lower San Joaquin River flow tended to peak in May and June, with an average monthly flow of almost 11,000 cfs, and declined rapidly to an average monthly flow of approximately 1,200-1,300 cfs in August and September. Since 1979, the average monthly flow has peaked in March at just over 10,000 cfs, with a more gradual decline to approximately 2,400 cfs in August.

5.1.3 Eastside Tributaries

The tributaries to the east of the San Joaquin River achieve maximum elevations of 2100 feet and descend at moderate slopes to sea level. The basins are rainfall-dominant and snowfall is not a significant factor in runoff.

Overbank flooding occurs as a result of prolonged winter storms of moderate intensity. Much of the precipitation occurs from November through April; these winter storms are associated with frontal systems from the Pacific Ocean moving against the Sierra Nevada. The resulting floods are usually characterized by high peak flows of short duration, but when antecedent rainfall has resulted in saturated ground conditions or when the ground is frozen, the volume of runoff is much greater and flooding is more severe.

Thunderstorms lasting up to three hours can occur over small areas at higher elevations from late spring through early fall, resulting in runoff with high peak flows of short duration and low volumes.

5.2 Vegetation

Historic native vegetation in the project area has been highly altered and fragmented as a result of flood risk management, land reclamation, urbanization, agriculture, and navigation projects. Flood risk management infrastructure in this area includes levees, river and tributary realignments, constructed channels, erosion protection, and control structures. Vegetation within the project area maintains some remnants of what was historically present, including Great Valley cottonwood riparian forest, Great Valley oak riparian forest, coastal and valley freshwater marsh. It also includes nonnative woodlands, agricultural (row crops, orchards and vineyards), and developed lands like lawns, parks and golf courses. Non-native grasses, forbs, shrubs, trees, and vines are interwoven throughout the landscape. Open water habitat includes rivers, tributaries, canals, and ditches. Ditches may contain water seasonally or year-round.

Once, the San Joaquin River and tributaries were framed by dense riparian forest. Today, riparian vegetation consists of narrow linear strips and occasional patches of riparian forest and riparian scrub growing on or adjacent to the levee. Larger areas of riparian forest are present in some areas where the levee is set back from the river or tributary leaving floodplain on the waterside of the levee. More detailed description of the vegetation in the project area is provided below.

The northern portion of the project area includes Mosher Slough, Fivemile Slough, Fourteenmile Slough, Tenmile Slough, Stockton Deep Water Ship Channel. The central and southern part of the project area includes the San Joaquin River and its tributaries, including Calaveras River, Smith Canal, Mormon Slough, French Camp Slough and Duck Creek, the southern part of the project area is comprised of French Camp Slough and the San Joaquin River near the northern end of RD 17. The project area occurs within the Great Central Valley subdivision of the California floristic Province in San Joaquin County (Hickman, Ed. 1993:45). The topography of the portions of the project area adjacent to the levees is relatively level, and elevations in the project area range from less than 5 feet to approximately 38 feet above mean sea level.

5.2.1 Vegetation by Project Reach

Representative photographs of each waterway included in the Proposed Action are provided in Appendix D.

Throughout the project area levee crowns are either paved or graveled for access and inspection and are generally devoid of vegetation.

Mosher Slough

Mosher Slough runs through a highly urbanized area. Woody riparian vegetation is most robust near the confluence with Fourteenmile Slough. It is comprised of typical Valley riparian trees and shrubs. Emergent wetland vegetation occurs intermittently at the water's edge. Landside vegetation includes non-native landscape trees and shrubs as well as natives. Typical wetland vegetation lines some stretches of this reach.

Fourteenmile Slough, Fivemile Slough, Tenmile Slough

Waterward of the levees, some woody riparian trees and shrubs boarder these highly engineered waterways. Within some of the sloughs and canals, aquatic weeds cover much of the water surface. Along the edges of the waterways wetland vegetation is present intermittently. Within Fourteenmile Slough, intertidal vegetation is present on rocky substrate that is exposed during low tides. In Buckley Cove, near the confluence of Tenmile Slough with the Sacramento Deep Water Ship Channel, wetland and subtidal vegetation is present along with aquatic weeds. Landside vegetation is comprised mainly of row crops with some parcels in orchard.

San Joaquin River

On the San Joaquin River, lands waterside of the levees are very narrow and support a remnant riparian forest. Trees and shrubs occur in small patches or may be scattered individuals. Vegetation on the waterside of levee slopes in the project area is highly varied, ranging from ruderal herbaceous vegetation and annual grasses with few shrubs, to dense shrubs with little overstory, to mature riparian forest. Potential Shaded Riverine Aquatic (SRA) cover is found along much of the river in the project area.

Dominant waterside tree species include cottonwood, willow, oak, box elder, and black walnut. In the project area, common shrub species include willow, wild Rose, and blackberry. Elderberry shrubs are also present in some locations. Ruderal herbaceous vegetation is present on levee slopes. In some places the tree overstory along the levee is so dense that the leaf fall and shading, as well as human activity, precludes development of dense understory vegetation. At Does Reis road there is a park on both sides of the levee. Vegetation includes willows, weeping willow, cottonwood, fruitless mulberry, mesquite (thorns), elderberry, mistletoe.

Landside levee slopes are primarily barren or covered with ruderal vegetation. Beyond the base of the levees, riparian vegetation is rare but occasionally present in small isolated patches. Other trees include occasional single or isolated stands of native oaks and nonnative trees planted around farms, agricultural fields, and residential or other types of development. Larger remnant patches of Great Valley cottonwood riparian forest located within the study area are dominated by large Fremont cottonwood, trees and Goodding's willow (AECOM 2011). Most of the otherwise linear or smaller patchy areas of this community lack Fremont cottonwood and are represented by Gooding's willow, red willow, arroyo willow, narrow leaved-willow, and scattered valley oak, Oregon ash, and buttonbush (AECOM 2011). Native ground cover, mainly found in the larger remnant patches of riparian forest, include California blackberry and wild rose. Common nonnative understory species found in most elements include Himalayan blackberry and tree tobacco. Most of the Great Valley cottonwood riparian forest community could also be characterized as Great Valley riparian scrub, which does not include Fremont cottonwood and is characterized by a shorter canopy and more uniform structure; however, this habitat is part of the Great Valley cottonwood riparian forest that was extensive and connected along this entire reach of the San Joaquin River, and this document therefore describes all riparian habitat as such. (AECOM 2011)

Calaveras River

Levees and the lands adjacent to both the waterside and landside of the levees in the reach of the Calaveras River above, and just below, the Stockton Diverting Canal are largely devoid of trees and shrubs. The exception is some orchards landward of the north levee. Moving downstream, more trees and shrubs are present on and adjacent to the levees. In the highly urbanized reaches, many of the landside trees and shrubs are associated with landscape plantings in yards, parks, and public rights of way. Wetland vegetation appears to line the channel in places.

Smith Canal

Smith canal is surrounded by urban residential areas, including hard-scaping (sidewalks) and some landscape plantings adjacent to the water's edge. Near the confluence of the canal with the San Joaquin River, there is a public park, including a picnic area, boat launch ramp and associated infrastructure. There is an irrigated lawn and a mixture of native and non-native trees and shrubs. Wetland vegetation is prevalent at the water's edge and non-native invasive water plants inhabit the "bay" near the boat launch ramp. Invasive waterweeds occupy much of the inlet in the vicinity of the boat launch ramp.

French Camp Slough and Duck Creek

Levees along Duck Creek are clear of trees and shrubs. Adjacent lands are largely in agriculture with urban development beginning to extend into these lands. French Camp Slough upstream of the confluence with Duck Creek is very similar in character to Duck Creek. Levees are free of trees and shrubs and adjacent lands are in agriculture with urban lands extending towards the levee slough.

The lower reaches of French Camp Slough (between Duck Creek and the San Joaquin River) are surrounded landward by urban development. The Weston Ranch residential development is immediately to the south in the northern portion of RD 17. A municipal golf course extends adjacent to the northern bank/levee of French Camp Slough in Central Stockton. Between the north and south French Camp Slough levees is an "island" of land that is in agriculture. The perimeter of this island contains a fairly thick margin of trees and shrubs.

In the lower French Camp Slough reach, the levee crown includes a paved road. The landside levee slope and toe are mostly devoid of vegetation. There are some annual grasses and herbs. These are largely non-native weedy plants. Where trees and shrubs are present within the landside easement, they are mainly landscape plantings associated with public rights of way and private yards. The waterside levee slope and easement have trees and shrubs throughout their length, being quite dense in some areas. Trees include native valley oak, box elder, cottonwood, black walnut, and willows. Elderberry shrubs, poison oak, patches of dead willow shrubs, and snags are present. In the canal between the RD 17 levee and the mid-channel island to the north, wetland plants are abundant. These include tules, nut sedges, tule potato. Non-native English walnut trees, water hyacinth, and mistletoe are also present.

5.2.2 Site-Specific Analysis of Riparian Vegetation

Existing vegetation is identified by waterway in Table E-1 in Appendix E. Table C-1 in Appendix C shows the percent of the land surface that would be affected by construction of the flood risk management features. This does not show the potential area potentially affected by establishment of the ETL 1110-2-583 standards outside of the construction footprint for the flood risk management features. The maximum amount of vegetation that would be required to be removed would be the difference between Table E1 and Table E-2. However, during PED additional engineering investigations will be completed to evaluate the suitability of levees included in the Recommended Plan for a variance to the ETL. Based upon the information available at this time using engineering judgment, we estimate that 25% of the existing vegetation on the waterside slope and within the waterside easement may be allowed to remain under a variance. On the landside, typically the landside slope and within 15 feet of the landside toe of the levee all woody vegetation will be removed and would not be suitable for a variance.

Analysis of total linear feet (lf) of potential existing SRA was conducted using Google Earth Pro for the reaches associated with the Recommended Plan (Alternative 7a). Table 6 provides a summary of potential SRA by waterway a detailed table can be found in Appendix E, Table E-1.

Table 6: Summary of Reach-Specific SRA Analysis.

Alternative 7a Project Footprint	
Reach	***SRA (lf)***
Mosher Slough	0
Delta Front	0
Calaveras	10,406
San Joaquin River Downstream of French Camp Slough	7,949
French Camp Slough & Duck Creek	7,153
TOTAL	**25,508**

5.3 Baseline for Affected Species in the Study Area

5.3.1 Valley Elderberry Longhorn Beetle

The Corps environmental specialists conducted elderberry shrub surveys along the project action area on June 23 and 24, 2015. The team drove along the project levees observing the levee crown and structure, 15 feet landside, and 15 feet waterside.

The survey area consisted of the levee structure and 100 feet on both the waterside and landside; where access was available or possible. The survey process located individual elderberry shrubs and clusters. The location of each shrub or cluster was recorded using a Tremble GPS unit and is shown on Plates 1-1g and in Appendix D in the Elderberry Map Book. Shrubs on the waterside of the rivers and sloughs were considered riparian. Shrubs located at the levee crown or land side were considered non-riparian. The stem sizes and quantity were recorded along with the presence or non-presence of exit holes. The height and width of each shrub was evaluated and the overall health was recorded. Table 7 displays the total elderberry shrub occurrences within 100 feet of the TSP action area levees.

Table 7: Elderberry Shrub Occurrences Within Action Area

Levee Side	Recommended Plan Estimations
Non-Riparian	28 shrubs
Riparian	16 shrubs
TOTAL	**44 shrubs**

North Stockton

The Corps survey determined that 8 elderberry shrubs occur within 100 feet of the North Stockton reach of the project. The number of stems can be found below in Table 8. There were no exit holes or VELB found in any of the shrubs. All of the shrubs occur within the area considered riparian/ and occur on the water side of the levee.

Central Stockton

The Corps survey determined that 36 elderberry shrubs occur within 100 feet of the Central Stockton reach of the project. The survey determined that 8 of the Central Stockton shrubs occur within the riparian/water side of the levee. Twenty-eight of the shrubs occur within the non-riparian/landside of the levee and the remaining 28 were located on the landside of the levee and are considered non-riparian. The number of stems identified during the survey can be found below in Table 8. There were no exit holes or VELB found in any of the shrubs.

Table 8: Elderberry Stem Counts

Location	Habitat Type	Stems 1-3”	Stems 3-5”	Stems > 5”	Presence of Holes or Beetles
North Stockton	Riparian	20	4	2	No
Central Stockton	Riparian	19	5	6	No
Central Stockton	Non-Riparian	51	23	21	No
Total	**Riparian**	**39**	**9**	**8**	
	Non-Riparian	**51**	**23**	**21**	

5.3.2 Giant Garter Snake

GGS are not known to occur along much of the San Joaquin and Lower San Joaquin Rivers since the rivers do not contain features or attributes normally associated with GGS habitat. Larger rivers with flood control features, riparian vegetation and steep rocked banks are not typically utilized by GGS. However, suitable low quality habitat within the project area is present. Numerous sloughs, canals, low gradient streams, freshwater marsh habitats, and irrigation ditches exist where a prey base of small fish and amphibians are present. Grassy banks and emergent vegetation for basking and areas of high ground protected from flooding during winter is present. One occurrence in project vicinity outside of the action area has been recorded.

<u>North Stockton</u>

No occurrences.

<u>Central Stockton</u>

The CNDDB listed one occurrence of GGS within the Central Stockton project vicinity in the Stockton Diverting Canal near the project action area.

5.3.3 Chinook Salmon and Steelhead

Factors such as levee construction and bank armoring have altered habitat for Chinook salmon and steelhead. These factors prevent natural geomorphic processes which results in reduced floodplain habitat, altered river bank substrate size, and decreased amounts of quality riparian and SRA habitat, which in turn, reduce habitat availability and quality for salmon and steelhead (NMFS 2006a). These changes have affected primarily adult and juvenile migration as well as juvenile rearing.

Bank armoring projects that have been conducted recently by the Corps and DWR, some of which are on-going, have incorporated design elements to offset the loss of habitat that generally results from placement of river bank protection materials.

5.3.4 Green Sturgeon

Channelization of the action area has resulted in the removal of riparian and IWM, which simplify ecosystem functions. Simplification results in reduced food input and pollutant and nutrient processing (Sweeney et al. 2004 as cited in NMFS 2006a). These factors have degraded habitat quality for larvae and post-larvae and to a lesser extent, rearing and migrating juvenile and/or adult green sturgeon (NMFS 2006b).

5.3.5 Delta Smelt

As discussed for Chinook salmon and steelhead, levee construction and bank armoring have altered waterside bank habitat resulting in the destruction of spawning and refugia areas for delta smelt. Loss of riparian habitat and overall habitat simplification also reduces food input and pollutant and nutrient processing (Sweeney et al. 2004 as cited in NMFS 2006b), which may impair productivity of delta smelt. Revetment also fragments areas of high quality habitat and accelerates water velocity, which affects use of those areas by delta smelt and other native fishes (USFWS 2006b).

6.0 EFFECTS OF THE PROPOSED ACTION

6.1 Effects on the Environmental Baseline

Effects of the proposed action include reductions in nearshore aquatic and riparian habitat that is used by aquatic and terrestrial species. A summary of estimated impacts to vegetation is presented by sub-region in Appendix E, Table E-3.

6.2 Ongoing Project Actions

As described in Section 2.0, in-water construction work will be completed during established work windows for salmonids and delta smelt. Maintenance activities may occur year-round in the dry areas. Effects from on-going activities (e.g., maintenance) are expected to be similar to effects described in Section 6.0, although the magnitude of the effects will be less.

6.3 Valley Elderberry Longhorn Beetle

Effects on VELB may occur if elderberry shrubs are incidentally damaged by construction personnel or equipment. Direct effects include removal or transplantation of VELB habitat for all shrubs within 20 feet of construction activities. Elderberry shrubs located in areas that cannot be avoided by construction activities may be harmed by transplanting. Potential impacts due to damage or transplantation include direct mortality of beetles and/or disruption of their lifecycle.

Protocol-level surveys were conducted in the project area on June 24 and 25 2015. Information was recorded for each shrub that could be directly or indirectly affected by the proposed project, including number of stems between 1 and 3 inches, 3 and 5 inches, and greater than 5 inches in diameter; whether each stem 1 inch or more in diameter is located in a riparian or upland area; and presence of VELB exit holes. It was estimated that a maximum 44 elderberry shrubs could be adversely affected due to construction activities such as removal of the shrub, heavy equipment vibration, and dust covering the elderberries. Implementation of the avoidance, minimization, and mitigation measures discussed in Section 3.9.1 would reduce impacts to VELB.

Long-term effects of the project may include reduced viability of elderberry shrubs due to the placement of project area materials. Temporal loss of habitat may also occur due to transplantation of elderberry shrubs. Although compensation measures include restoration and creation of habitat, mitigation plantings will likely require five or more years to become large enough to provide supporting habitat. Furthermore, associated riparian habitats may take 25 years or longer to reach their full value.

Removal of shrubs may also fragment remaining habitats, which may make dispersal more difficult. However, levee repairs may also have beneficial effects by protecting elderberry shrubs from being damaged or washed out due to slope failure.

The vegetation free zone required by the Corps ETL 1110-2-583 would be established at the time of construction of flood features in each reach. This vegetation free zone extends from 15 feet landward of the levee to 15 feet waterside of the levee and includes the levee slopes and crown. However, during PED levee reaches would be evaluated for a vegetation variance that could allow up to 50% of vegetation to remain on the lower half of the water slopes of the levees and out 15 feet. This could reduce the number of shrubs that need to be removed by 14. Because of the potential direct effects discussed in detail above, including the removal of up to 44 elderberry shrubs with 151 stems and the potential for injury or mortality of VELB during removal and transplantation, the Proposed Action is likely to adversely affect VELB. Measures to reduce these impacts are detailed in Section 3.9.1. Table 9 shows the recommended compensation ratios based upon the USFWS ratio calculations.

Table 9: Elderberry Compensation Worksheet

Affected elderberry plant minimization ratios based on location, stem diameter, and presence of exit holes							
Worksheet			**No. of Stems**	**elderberry ratios**	**elderberry planting**	**associated native planting**	**native ratios**
Location	**stems**	**Holes**		**multiplier (ratio)**			
non-riparian	greater than or = 1" & less than or = 3"	No	**51**	1	51	**51**	**1**
non-riparian	greater than 3" & less than 5"	yes	**0**	2	0	**0**	2
	greater than 3" & less than 5"	No	**23**	2	46	**46**	1
non-riparian	greater than or = 5"	yes	**0**	4	0	**0**	2
	greater than or = 5"	No	**21**	3	63	**63**	1
riparian	greater than or = 1" & less than or = 3"	yes	**0**	6	0	**0**	2
	greater than or = 1" & less than or = 3"	No	**39**	2	78	**78**	1
riparian	greater than 3" & less than 5"	yes	**0**	4	0	**0**	2
	greater than 3" & less than 5"	No	**9**	3	27	**27**	1
riparian	greater than or = 5"	yes	**0**	6	0	**0**	2
	greater than or = 5"	No	**8**	4	32	**32**	1
Totals			**151**		**297**	297	

6.3.1 Short-Term Effects (Construction-Related Direct Effects)

Permanent Loss of Elderberry Shrubs and Potential Loss of Individual VELB from Shrub Removal

Removal of habitat (elderberry) and potential injury or mortality of VELB associated with construction of the Proposed Action would be considered direct effects on VELB. Trimming of elderberry stems that are 1 inch or greater in diameter could also result in injury or mortality of VELB. Because VELB larvae may feed on the roots of elderberries, disturbance of elderberry roots within the shrub dripline could also result in injury or mortality of individuals. Where root damage is expected to be extensive, elderberry shrubs would be removed. Where damage is limited (few roots affected) and roots are expected to grow back, impacts would be considered temporary. There are 17 shrubs just outside the project footprint along the San Joaquin River that would likely be left in place (Plate 1-Elderberry survey data). These include shrubs 7-18, 23, and 26-30. They have been included as part of the 44 discussed above in case they cannot be protected in place. Because incidental take of VELB would be difficult to detect or quantify, effects on elderberry shrubs will be used as a proxy for measuring take.

Elderberry shrubs within the construction area that cannot be protected will be removed in accordance with USFWS-approved procedures outlined in the Conservation Guidelines (USFWS 1999a). Shrubs will be transplanted within the action area to a location outside the levee footprint or to the French Camp Conservation Bank for VELB Recovery. Transplanted shrubs will be moved prior to construction when the plants are dormant, approximately November after they lose their leaves through the first 2 weeks in February. Transplanting during the dormant period will reduce shock to the plant and increase transplantation success. However, transplanted elderberry shrubs may experience stress, a decline in health, or death due to changes in soil, hydrology, microclimate, or associated vegetation.

Elderberry shrubs that can be avoided at the dripline of the shrub or greater distance will be protected with fencing and or buffer areas as described in the conservation measures.

Additional surveys of elderberry shrubs to be transplanted will be conducted by a qualified biologist prior to transplantation. The data collected during the surveys prior to transplanting will be used to determine if the project is exceeding their compensation requirements, or if additional plantings are necessary.

6.3.2 Construction-Related Indirect Effects

As discussed above, indirect effects are caused by or result from the Proposed Action, are later in time, and are reasonably certain to occur. Indirect effects may occur outside the area directly affected by the action.

Loss of Connectivity to Adjacent Habitat

Loss of connectivity between elderberry shrubs may result when elderberries or associated vegetation is removed. Removal of such vegetation could result in gaps in vegetation that are too wide for VELB to travel across due to their fairly limited movement distances (Talley et al. 2006a), resulting in separation of individuals or reducing the possibility of colonization of adjacent areas. Removal of associated vegetation may result in an altered habitat structure or microclimate that could affect behaviors of VELB in response to these changes in unforeseen ways (USFWS 2003).

Although more research is needed, VELB has been observed to fly a mile or more in contiguous or fairly contiguous habitat, and exit holes have been observed on isolated shrubs that are a minimum of 0.25 mile (0.4 kilometer) from the next nearest elderberry (Arnold pers. comm. 2011). Within the American River Basin, evidence suggests that local beetle movements are farther within the riparian corridor (141±144 feet [43±44 meters]) than in the adjacent non-riparian scrub (82±52 feet [25±16 meters]) (average±1 standard deviation nearest neighbor distances between recent exit holes) illustrating that VELB population extents may also be habitat-specific (Talley et al. 2006a).

Although up to 44 elderberry shrubs could be removed as part of the Proposed Action, it is likely that approximately 17 shrubs could be avoided in place and other elderberry shrubs would be unaffected in the Action Area and continue to provide habitat for VELB. This includes elderberry shrubs on the opposite bank of the rivers and sloughs, less than 250 feet away from the project area. Given the distance VELB has been observed to fly, and the amount of elderberry shrubs that will remain adjacent to the project area, VELB is not expected to be indirectly affected by a loss of connectivity to adjacent habitat.

Soil Disturbance Adjacent to Roots

Ground disturbance within 20 feet (6.1 meters) of an elderberry shrub’s dripline could result in disturbance of roots. Root damage could result in stress or reduced vigor of elderberry shrubs. Because construction of the Proposed Action may result in disturbance within 20 feet (6.1 meters) of the dripline of elderberry shrubs, indirect effects on these shrubs may result. Elderberry shrubs will be fenced and buffered to minimize soil disturbance adjacent to roots. With this measure in place, and because elderberry shrubs are hearty and frequently re-sprout after damage, this indirect effect is not expected to substantially affect VELB.

Dust

Vehicle travel on the levee road adjacent to elderberry shrubs during construction of the Proposed Action could result in dust becoming airborne and settling on elderberries. The levee road is graveled, and existing shrubs are and have been exposed to dust from vehicles associated with farming and levee maintenance. Construction of the Proposed Action would increase the amount of dust in the Action Area as a result of ground-disturbing activities and an increase in the frequency of vehicles driving on the levee road. The amount of dust in the Action Area would be minimized through dust control measures. Additionally, according to Talley et al. (2006b), in an experiment along the American River Parkway (Sacramento County) conditions of elderberry shrubs related to dust from nearby trails and roads (paved and dirt) did not affect the presence of VELB. Additional work by Talley and Holyoak (2009) found no effect on elderberries from dust accumulations. Because dust has not been found to greatly affect elderberry shrubs and because dust control measures would be implemented during construction, this indirect effect is not expected to substantially affect VELB.

Altered Hydrology

Reduction of water to elderberry shrubs as a result of altered of hydrology from changes in topography or compaction of soil could result in reduced shrub vigor/vitality and an associated decrease in shoot, leaf, and flower production and ultimately reduce the suitability of the shrubs to provide habitat for VELB. In most portions of the Action Area, the levee will be degraded and re-built within the same footprint, and would not modify the hydrology of the surrounding area where elderberries may be present. There may be a few instances where the slope is modified or there are other changes that may affect the hydrology in the Action Area. These situations are expected to be rare. Therefore, altered hydrology as a result of the Proposed Action is not expected to substantially affect VELB.

Existing Elderberry Shrubs in the Conservation Area

Elderberry shrubs to be removed will be transplanted to the French Camp Conservation Bank for VELB Recovery, which contains existing elderberry shrubs or to a location within the action area but outside the levee footprint. Although transplantation activities may occur within 100 feet of existing elderberry shrubs, it is unlikely that they would be indirectly affected by transplantation activities, as the transplantations would be conducted by qualified individuals who would be knowledgeable about elderberry shrubs and the existing conditions within the conservation area.

Temporal Loss of Habitat

It generally takes 5 or more years for newly planted elderberry cuttings/seedlings to become large enough to support beetles, and it generally takes 25 years or longer for riparian habitats to reach their full value (USFWS 1994). The Corps is proposing to transplant elderberry shrubs within the Action Area but outside the levee footprint or to the French Camp Conservation Bank which is adjacent to the project areas. No temporal loss of habitat for VELB is expected. Additional elderberry plantings in the conservation area will provide additional and/or replacement habitat for VELB in future years.

6.3.3 Operations and Maintenance- Related Effects

Elderberry shrubs at the perimeter of the project footprint adjacent to access roads and paths may require occasional trimming.

6.4 Giant Garter Snake

Much of the project area is unlikely to provide GGS aquatic habitat because it consists of larger rivers and flood control features, often surrounded by riparian vegetation and steep banks. However, the upland areas adjacent to rice fields and canals associated with grasslands could provide basking habitat and refugia habitat (thermoregulation in the summer and hibernacula in the winter) for the snakes.

6.4.1 Short-Term Effects

Direct effects including construction activities associated with this alternative would not result in the permanent loss of waters of the United States, including wetlands or upland habitat. Construction activities would result in temporary disturbance to wetland and upland habitat. This effect would not be considered significant because fixing the levee in place would not remove nearshore wetlands and would only temporarily disturb wetland and upland habitat that provides suitable habitat ranging between marginal and low quality with low to moderate food, cover, and water values for GGS. Proposed levee work on the water side of the San Joaquin River levees would not impact GGS since high flows exclude this snake.

In the short term, there are effects due to temporary habitat disturbance from construction activities to fix the levee in place. Construction would result in the temporary disturbance up to 25 acres of suitable upland habitat in the project area, including the upper portion of the levees along the Calaveras River, the delta front, and Fourteenmile Slough (Plate 2). Temporarily affected upland habitat would be restored to preproject conditions. It is estimated that 3 acres of temporary construction impacts to seasonal and permanent wetland habitat that provide foraging, breeding, and rearing habitat for the GGS would also occur during construction of the Fourteenmile Slough Closure Structure. Temporarily affected wetland habitat would be restored to preproject conditions. In addition, the avoidance, minimization, and mitigation measures discussed above in Section 3.9.2 would be implemented to reduce impacts to GGS.

Temporary Disturbance of Suitable Aquatic and Upland Habitat for GGS

Construction of the Proposed Action would result in the temporary loss or disturbance of 3 acres of suitable aquatic habitat and approximately 25 acres of suitable upland habitat for GGS (Plate 2). Temporary loss of suitable aquatic habitat in the Action Area would result from work within the Fourteenmile Slough Closure Structure area. Temporarily affected aquatic and upland habitat would be restored to pre-project conditions within a maximum of two seasons (a season is defined as the calendar year between May 1 and October 1 [USFWS 1997]), as described in Conservation Measure 16. Temporary losses of suitable habitat for GGS within the Action Area are summarized in Table 10. Because all impacts on suitable GGS habitat would be temporary, no compensation would be provided.

Disturbance or degradation of suitable aquatic habitat for GGS in the Action Area could occur if soil or other materials are side cast or fall into the habitat. Fuel or oil leaks or spills adjacent to aquatic habitat could also cause degradation of habitat. These potential effects would be avoided by installing sediment and construction barrier, locating staging areas away from aquatic habitat, implementing sediment and contaminant BMPs as required by the NPDES permit (SWPPP), and preparing a frac-out plan.

Table 10: Effects on GGS Habitat in the Action Area in Acres

Habitat	Levee Construction Areas	Borrow Areas	Total
Permanent Effects			
Aquatic habitat	0	0	**0**
Upland habitat (ruderal within 200 feet of aquatic habitat)	0	0	**0**
Temporary Effects			
Aquatic habitat	3	0	**3**
Upland habitat (ruderal within 200 feet of aquatic habitat)	25	0	**25**

Potential Injury or Mortality of GGS

Construction activities in suitable habitat could result in the injury, mortality, or disturbance of GGS. GGS could be injured or crushed by construction equipment working in suitable aquatic and upland habitat, or if soil or other materials are side-cast or fall into suitable aquatic habitat. Snakes could also be killed by construction vehicles traveling though the Action Area. Fuel or oil spills from construction equipment into aquatic habitat could also cause illness or mortality of GGS. Trenches left open overnight could trap snakes moving through the construction area during the early morning hours. Noise and vibrations from construction equipment, and presence of human activity during construction activities may also disturb GGS within the Action Area. Most construction activities will be limited to the snake's active period (May 1–October 1) when the potential for direct mortality is reduced because snakes can actively move and avoid danger.

Potential effects on GGS would be minimized or avoided by implementing the avoidance, minimization, and mitigation measures discussed in Section 3.9.2 including conducting biological resources awareness training, conducting work during the active period (May 1 - October 1) installing exclusion fencing around suitable habitat, conducting preconstruction surveys and monitoring, and providing escape routes and ramps or covering open trenches.

6.4.2 Indirect Construction Effects

Construction of the Proposed Action is not expected to have any indirect effects on GGS. Several indirect effects on GGS and its habitat were considered but were determined to have no potential to occur as a result of the Proposed Action. Specifically, the following determinations were made.

There would be no increase of trash, hazardous waste, or off-road vehicle use due to increased human presence. The Proposed Action would not result in development or increased access to GGS habitat.

There would be no increased use of herbicides and/or pesticides as a result of the Proposed Action. Vegetation control would remain the same as existing conditions—typically twice per year. Herbicide and bait station use would also be at the same frequency as existing conditions.

The proposed action would result in direct effects on habitat suitability which would create temporary effects for the GGS. The temporary effects to aquatic and upland habitat could be minimized by implementation of the construction avoidance, minimization, and compensation measures. However construction effects may affect but are not likely to adversely affect GGS and its critical habitat.

6.4.3 Long-Term Effects (Operations and Maintenance-Related Effects)

The Proposed Action would not result in an increase in potential mortality of GGS. Potential impacts to GGS may result from an increase in vehicles traveling to the project components and maintenance activities. Inspections are infrequent (flood control facilities four times per year plus inspections after high water events), and travel would be along the existing levee road and paved roads to the levee. Patrol road recondition activities would typically be performed once per year and would include placing, spreading, grading, and compacting aggregate base or substrate. Erosion control and slope repair activities would include re-sloping and compacting; fill and repair of damage from rodent burrows would be treated similarly.

Rodent control measures required to control burrowing mammals from burrowing into the levees would continue to be used. Measures implemented by the maintaining agencies could include application of rodenticides or the grouting of voids. These measures would reduce potential hibernacula from developing for use during the winter dormant period.

O&M activities would occur between May 1 and October 1 during the snake's active season to minimize impacts to the species. With the implementation of the avoidance, minimization, and compensation measures, long-term effects from O&M may affect but are not likely to adversely affect GGS and its critical habitat.

6.5 Fish and Aquatic Habitat Overview

The assessment of effects on fish considers the potential occurrence of protected species and life stages relative to the location, magnitude, timing, frequency, and duration of project actions. Species habitat attributes potentially affected by project implementation include spawning habitat area and quality, rearing habitat area and quality, migration habitat conditions, and water quality. The relative value of each project sub-region was evaluated and provided in Table 11 along with a description of the existing habitat, project actions and estimated impacts.

Table 11 Existing Habitat Project Actions and Estimated Impacts

Action Area (Sub-Regions)	Cost Reaches	Waterway	Reach Description	Proposed Measure(s)	Waterside Vegetation Cleared for Construction & ETL Compliance	Total Existing Woody Riparian (WR)/SRA Within Project Footprint	Total # Acres Waterside Woody Riparian Lost (Lower Levee)	Total Linear Footage Waterside SRA Lost	Qualitative Value[1] of Habitat (Species)
MOSHER SLOUGH	MC_30L (6,600 ft) MC_10L_20L (10,700 ft)	Mosher Slough Mosher Slough	Thornton Road to railroad tracks Shima Tract to Thornton Road	Cutoff Wall Cutoff Wall, Levee Height Fix (sea level rise)	Removal of 100% vegetation in upper half of levee within construction footprint. Removal of up to 75% of vegetation on lower half of levee slope for ETL compliance.	3.5 acres (WR) 0 lf (SRA)	1.5 acres	0 lf	Low quality habitat for all life stages of delta smelt. Poor water quality for juvenile rearing and migration for salmon, steelhead, and green sturgeon.
DELTA FRONT	ST_10R_20R (6,700 ft)	Shima Tract	Mosher Slough to Fivemile Slough	Cutoff Wall, Erosion protection (landside)	Removal of 100% vegetation in upper half of levee within construction footprint. Removal of up to75% of vegetation on lower half of levee slope for ETL compliance.	2.75 acres (WR) 0 lf (SRA)	0.75 acres	0 lf	Low quality habitat for all life stages of delta smelt. Poor water quality for juvenile rearing and migration for salmon, steelhead, and green sturgeon.
	FS_10R (1,700 ft)	Fivemile Slough	Shima Tract to Fourteenmile Slough	Cutoff Wall, Erosion protection (landside)	Removal of 100% vegetation in upper half of levee within construction footprint. Removal of up to 75% of vegetation on lower half of levee slope for ETL compliance.				Low quality habitat for all life stages of delta smelt. Poor water quality for juvenile rearing and migration for salmon, steelhead, and green sturgeon.
	FM_60L (1,600 ft) FM_50L (300 ft) FM_40L (1,500 ft) FM_30L (7,000 ft)	Fourteenmile Slough Fourteenmile Slough Fourteenmile Slough Fourteenmile Slough	Fivemile Slough to Proposed Closure Structure Approximately 1,500 feet west of Fivemile Slough Approximately 1,250 feet southeast setback out from proposed closure structure From setback cut south to Tenmile Slough	Seismic Fix, Slope Reshaping, Levee Height Fix (sea level rise), Erosion protection (landside) Closure Structure Seismic Fix, Levee Height Fix (sea level rise), Erosion protection (landside) Seismic Fix (adjacent levee), Erosion Protection (landside), Setback levee	Removal of 100% vegetation in upper half of levee within construction footprint. Removal of up to 75% of vegetation on lower half of levee slope for ETL compliance. Removal of all vegetation for Closure Structure Easement				High quality for spawning and rearing habitat for delta smelt. Poor water quality habitat for juvenile reaing and migration for salmon, steelhead, and green sturgeon.
	TS_30L (5,900 ft) TS_20L (1,600 ft) TS_10L (4,000 ft)	Tenmile Slough Tenmile Slough Tenmile Slough/Buckley Cove Marina/San Joaquin River	Fourteenmile Slough to March Lane March Lane to West March Lane/Buckley Cove Way West March Lane/Buckley Cove Way to Calaveras River	Cutoff Wall, Slope Reshaping, Erosion Protection (waterside) Cutoff Wall, Slope Reshaping, Erosion Protection (waterside) Seismic Fix, Slope Reshaping	Removal of 100% vegetation in upper half of levee within construction footprint. Removal of up to 75% of vegetation on lower half of levee slope for ETL compliance.				High quality spawning and rearing CH for delta smelt. Low quality habitat for salmon, steelhead, and green sturgeon.
CALAVERAS RIVER	CR_10R-80R (23,000 ft)	Calaveras River – Right/North Bank Calaveras River – Left/South Bank Calaveras River – Left/South Bank Calaveras River – Left/South Bank Calaveras River – Left/South Bank	San Joaquin River to North El Dorado Street San Joaquin River to approximately I-5 Approximately I-5 to approximately North Pershing Avenue Approximately North Pershing Avenue to approximately North Pacific Street Approximately North Pacific Avenue to El Dorado Street	Cutoff Wall Cutoff Wall Cutoff Wall, Slope Reshaping Cutoff Wall Cutoff Wall	Removal of 100% vegetation in upper half of levee within construction footprint. Removal of up to 75% of vegetation on lower half of levee slope for ETL compliance.	11 acres (WR) 10,406 lf (SRA)	3.0 acres	7,805 lf	High quality habitat for delta smelt spawning and rearing. High quality habitat for steelhead adult migration and juvenile rearing and migration. Medium quality habitat for green sturgeon juvenile rearing and migration at confluence of Calaveras River. Medium quality EFH for salmon.
SAN JOAQUIN RIVER - DOWNSTREAM OF FRENCH CAMP SLOUGH	SC_30 (800 ft) SJR_10R (8,600 ft) SJR_20R (600 ft)	Smith Canal San Joaquin River Smith Canal	At the mouth of the canal between Brown's Island and Dad's Point From approximately 2,100 feet upstream of the Calaveras River to the proposed Smith Canal Closure Structure Dad's Point from the Closure Structure to approximately 375 feet down Monte Diablo Avenue	Closure Structure Cutoff Wall, Levee Height Fix (sea level rise) Floodwall	Removal of 100% vegetation in upper half of levee within construction footprint. Removal of up to 75% of vegetation on lower half of levee slope for ETL compliance. Removal of all vegetation for Closure Structure easement.	9 acres (WR) 7,949 lf (SRA)	3 acres	6,318 lf	**SJR**: High quality habitat for delta smelt spawning and rearing. High quality habitat for steelhead adult migration and juvenile rearing and migration. High quality habitat for green sturgeon juvenile rearing and migration at confluence. **Smith Canal**: Low quality habitat for delta smelt and green sturgeon. Low quality habitat for salmon and steelhead juvenile rearing and migration.
	SJR_30R (3,500 ft) SJR_40R-70R (12,600 ft)	San Joaquin River San Joaquin River	Railroad bridge just upstream of the Port of Stockton to Burns Cutoff Burns Cutoff to French Camp Slough	Cutoff Wall, Slope Reshaping Cutoff Wall	Removal of 100% vegetation in upper half of levee within construction footprint. Removal of up to 75% of vegetation on lower half of levee slope for ETL compliance.				**SJR**: High quality habitat for delta smelt spawning and rearing. High quality habitat for steelhead and salmon adult migration and juvenile rearing and migration. High quality habitat for green sturgeon juvenile rearing and migration at confluence.
FRENCH CAMP SLOUGH AND DUCK CREEK	FCS_10R (9,000 ft) DC_10R DC_20R DC_30R	Duck Creek ("a" only) Duck Creek Duck Creek	Part of CS-E-9 "a" and "b" NEPA Reaches French Camp Slough to 500 ft past I-5 crossing 500 feet past I-5 crossing to approximately Odell Avenue Approximately Odell Avenue to McKinley Avenue	Cutoff Wall Cutoff Wall New Levee Fix in-place Cutoff Wall, Levee Reshaping, Levee Height Fix	Removal of 100% vegetation in upper half of levee within construction footprint. Removal of up to 75% of vegetation on lower half of levee slope for ETL compliance.	4.75 acres (WR) 7,153 lf (SRA)	0.75 acres	5,509 lf	Low quality habitat for delta smelt. Low quality habitat for straying juvenile rearing and migrating salmon, steelhead, and green sturgeon. Medium quality habitat for salmon and steelhead high water habitat.

[1] High, Medium, and Low qualitative values were based on best professional judgement and personal communications with Jeff Stuart (NMFS). Parameters considered included temperature, pollutants, dissolved oxygen, and flows.

Direct construction-related effects on fish species include effects on individuals (e.g., displacement, disruption of essential behaviors, mortality) and immediate, short-term effects on habitat. These short-term effects are evaluated qualitatively and generally mitigated through the use of construction BMPs and limitations on construction windows.

Indirect effects typically last months or years, and generally involve physical alteration of the banks and riverbed associated with closure structures on Smith Canal and Fourteenmile Slough, and removal of riparian vegetation adjacent to the water's edge. These actions affect SRA cover, nearshore cover, and shallow water habitat (Fris and DeHaven 1993).

6.5.1 Factors That Affect Fish Abundance

The following section focuses on factors that potentially have affected the abundance of listed species in the Central Valley. Although not all species are discussed, factors affecting the listed species are assumed also to affect the abundance of other native species in similar fashion.

Many factors have contributed to historical declines of Central Valley Chinook salmon and steelhead. One of the major causes has been the construction of mainstem dams that have blocked salmon and steelhead from accessing much of their historical spawning and rearing habitat. Downstream of these dams, major factors that contributed to declines, and that currently limit salmon, steelhead, and green sturgeon populations, include altered flows and water temperatures from dam operations and water diversions, losses of suitable spawning substrate, channel alterations (e.g., channelization, levees) associated with navigation and flood risk–reduction, and associated losses of riparian, floodplain, and wetland habitat. The loss of floodplain and estuarine rearing habitat has had an unknown effect, but there is growing evidence that such habitats were once of major importance for the growth and survival of juvenile salmon (Moyle 2002; National Marine Fisheries Service 2009b; Moyle et al. 2008; Lindley et al. 2007).

Migration Habitat Conditions: The San Joaquin River provides a migration pathway between freshwater and ocean habitats for adult and juvenile steelhead, green sturgeon, and fall-run Chinook salmon that spawn and rear in the San Joaquin River system.

Flow in the San Joaquin River has been highly altered, and a large reach of the river above the project site is dewatered. Brandes and McLain (2001) found that juvenile Chinook salmon survival increased from the San Joaquin River to Chipps Island (Suisun Bay) when they remained in the San Joaquin River as opposed to moving through Old River and interior Delta. However, in lower flow years, survival through the lower San Joaquin River is only about 2% due to high predation mortality (Buchanan et al. 2013). Very little is known about steelhead survival through the lower San Joaquin River, but it is likely they also incur high predation mortality during low flows.

Very little is known about delta smelt survival and growth during upstream migration periods to spawning habitats. However, delta smelt that move up the San Joaquin River have an increased chance of getting entrained at the State Water Project (SWP) and Central Valley Project (CVP) pumps (Grimaldo et al. 2009). Rearing larval and early juvenile delta smelt typically move from freshwater to low salinity water when water temperatures increase (Nobriga et al. 2008). Larvae and juvenile smelt on the lower San Joaquin River and in Old River have a higher vulnerability to SWP and CVP entrainment than those found on the Sacramento River.

Water Temperature: Fish species have different responses to water temperature conditions, depending on their physiological adaptations. Salmonids in general have evolved under conditions in which water temperatures need to be relatively cool. Delta smelt and splittail can tolerate warmer temperatures up to approximately 22 (71°F) to 25°C (77°F). In addition to species-specific thresholds, different life stages have different water temperature requirements. Eggs and larval fish, for example, are the most sensitive to warm water temperature.

Unsuitable water temperatures for adult salmonids (such as Chinook salmon and steelhead) during upstream migration lead to delayed migration and the potential for lower reproduction rates. Warm water temperature and low dissolved oxygen also increase egg and fry mortality. U.S Fish and Wildlife Service (FWS) (1995) cited elevated water temperatures as limiting factors for fall- and late fall–run Chinook salmon.

Water temperature affects juvenile salmonid survival, growth, and vulnerability to disease. In addition, water temperature affects prey species abundance and predator occurrence and activity. Juvenile salmonids alter their behavior depending on water temperature, including movement to take advantage of cooler local water temperature refugia (e.g., movement into stratified pools, shaded habitat, subsurface flow) and in warmer water temperatures, improved feeding efficiency (e.g., movement into riffles).

Water temperature in Central Valley rivers frequently exceeds the tolerance of Chinook salmon and steelhead life stages. For example, adult fall-run Chinook salmon have been observed to stop their upstream migration when water temperatures exceed 66°F (Hallock et al. 1970). For Chinook salmon eggs and larvae, survival during incubation is assumed to decline with increasing temperature between 54 (12°C) and 61°F (16°C) (Myrick and Cech 2001). For juvenile Chinook salmon, survival is assumed to decline as temperature warms from 64 (18°C) to 75°F (24° C) (Myrick and Cech 2001). Relative to rearing, Chinook salmon require cooler temperatures to complete the parr–smolt transformation and maximize their saltwater survival. Successful smolt transformation is assumed to deteriorate at temperatures ranging from 63 (17°C) to 73°F (23°C) (Marine 1997 in Myrick and Cech 2001; Baker et al. 1995).

For steelhead, successful adult migration and holding are assumed to deteriorate as water temperature warms between 52 (11°C) and 70°F (21°C). Adult steelhead appear to be much more sensitive to thermal extremes than are juveniles (National Marine Fisheries Service 1996; McCullough 1999). Conditions supporting steelhead spawning and incubation are assumed to deteriorate as temperature warms between 52°F (11°C) and 59°F (15°C) (Myrick and Cech 2001). Juvenile rearing success is assumed to deteriorate at water temperatures ranging from 63°F (17°C) to 77°F (25°C) (Raleigh et al. 1984; Myrick and Cech 2001). Relative to rearing, smolt transformation requires cooler temperatures, and successful transformation occurs at temperatures ranging from 43°F (6°C) to 50°F (10°C). Juvenile steelhead, however, have been captured at Chipps Island in June and July at water temperatures exceeding 68°F (20°C) (Nobriga and Cadrett 2001). Juvenile Chinook salmon also have been observed to migrate at water temperatures warmer than expected based on laboratory experimental results (Baker et al. 1995).

As opposed to salmonids, delta smelt populations are adapted to warmer water temperature conditions in the Delta. Delta smelt may spawn at temperatures as high as 72°F (22°C) (U.S. Fish and Wildlife Service 1995) and can rear and migrate at temperatures as warm as 82°F (Swanson et al. 2000).

Contaminants: In the Sacramento and San Joaquin River basins, industrial and municipal discharge and agricultural runoff transport contaminants into rivers and streams that ultimately flow into the Delta. Principal pollutants in the Delta are agricultural chemicals and their derivatives (Herbold et al. 1992). Organophosphate insecticides, such as carbofuran, chlorpyrifos, and diazinon, are present throughout the Central Valley and dispersed in agricultural and urban runoff. The “first-flush” storm event or the “dormant spray” storm event is of most concern because of the higher concentration of contaminants in the runoff. In particular, diazinon and chlorpyrifos are applied to control wood26 boring insects in dormant stone fruit orchards from December to February (Zamora et al. 2003). These contaminants enter rivers in winter runoff and enter the estuary in concentrations that can be toxic to invertebrates (CALFED Bay-Delta Program 2000). Unlike severe bioaccumulants (toxic substances that increase in concentrations in living organisms) such as organochlorine pesticides, organophosphate pesticides typically are metabolized by most invertebrates. However, some organophosphate pesticides do not bioaccumulate, and some do bioaccumulate. In particular, diazinon has a solubility of 68.9 milligrams per liter (mg/L) (at 68°F [20 C]) but should not bioaccumulate in aquatic organisms (Zamora et al. 2003). Chlorpyrifos, on the other hand, is more persistent in the environment and tends to be hydrophobic to the water column. Chlorpyrifos has a lower solubility than diazinon (1.12 mg/L at 75°F [24 C]) and has a significant potential to bioaccumulate in aquatic organisms (Zamora et al. 2003). Because some organophosphates may accumulate in living organisms, they may become toxic to fish species, especially those life stages that remain in the system year-round and spend considerable time there during the early stages of development, such as Chinook salmon, steelhead, splittail, green sturgeon, and delta smelt.

Mercury contamination from historical mining activities is extensive on both sides of the Central Valley and occurs primarily from widely scattered hydraulic mining debris along eastside tributaries and active abandoned mines and associated debris piles on the west side. These sources continue to deposit significant amounts of mercury into the Bay-Delta system. Mercury occurs in several forms, including pure elemental mercury and toxic methylmercury. Mercury is mobile in aquatic systems as aqueous mercury or when attached to suspended particulate matter. Methylmercury is a significant water quality concern because small amounts can bioaccumulate in fish to levels that are toxic to humans and wildlife. In the Delta, mercury concentrations were highest in largemouth bass (*Micropterus salmoides*), common carp (*Cyprinus carpio*) and Sacramento suckers *(Catostomus occidentalis)* (Melwani et al. 2008).

Other contaminants of particular concern in the Bay-Delta system include high concentrations of trace elements such as selenium, copper, cadmium, and chromium; however, their effects on higher trophic levels are poorly understood, in part as a result of the complex distribution of high concentrations in both time and space (Herbold et al. 1992). In general, it appears that the highest concentrations occur in areas where human activity adjacent to the bay is also the highest. Although these trace elements also occur naturally, concentrations of these trace elements have been found to be high enough to adversely affect the growth and reproduction of aquatic animals in laboratory experiments (Herbold et al. 1992).

Predation: Nonnative species cause substantial predation mortality on native species. Predatory fish, including striped bass, have been found to accumulate at high numbers in Clifton Court Forebay. Studies at Clifton Court Forebay estimated that approximately 60% to more than 95% of hatchery-reared fall run Chinook salmon mortality is due to predation. Although the predation contribution to mortality is uncertain, the estimated mortality suggests that striped bass and other predatory fish, primarily nonnative, pose a threat to juvenile Chinook salmon moving downstream. Turbulence from water passing over dams and other structures may disorient juvenile Chinook salmon and steelhead, increasing their vulnerability to predators. Predators not only prey on salmon and steelhead; species such as striped bass, largemouth bass, and catfish also prey on delta smelt (U.S. Fish and Wildlife Service 1995).

Food: Food type and availability affect survival of fish species. Competition for food with species such as threadfin shad and wakasagi may affect delta smelt survival. Introduction of nonnative food organisms also may have an effect on delta smelt and other species' survival. For example, nonnative zooplankton species are more difficult for small smelt and striped bass to capture, increasing the likelihood of larval starvation (Moyle 2002). Splittail has also been affected by the introduction of nonnative species; the abundance of opossum shrimp has gone down as a result of the reduced abundance of native copepods upon which they feed, and this reduction of native copepods has been potentially attributable to the introduction of nonnative zooplankton and the Asiatic clam (*Potamorcorbula amurensis)*. In addition, flow affects the abundance of food in rivers, the Delta, and Suisun Bay. In general, higher flows result in higher productivity, including a higher input of nutrients from channel margins and floodplain inundation and higher production when low salinity occurs in the shallows of

Suisun Bay. Higher productivity, in turn, results in an increase in the availability of food for delta smelt and other fish species.

The potential effects of the proposed project are described below for each life stage and its habitat. Effects on designated critical habitat are addressed via description of habitat effects for each applicable species relative to two separate elements: Structural Features and Vegetation ETL.

6.6 Project Construction Elements

6.6.1 Cutoff Walls

CV Steelhead Direct Effects

Adult Migration - The project will have no effect on CV steelhead adult migration because all construction will occur out of water and at the top of the levee.

Spawning- The project will have no effect on CV steelhead spawning because all construction will occur out of water and at the top of the levee.

Juvenile Rearing-The project will have no effect on CV steelhead juvenile rearing and migration because all construction will occur out of water and at the top of the levee.

CV Steelhead Indirect Effects

Long-term changes in nearshore habitat are expected to have adverse effects on adult steelhead with substantial impacts in the absence of any off-site habitat compensation measures. In cases where off-site compensation is implemented, adult habitat will be reduced in the short-term, and will not increase in the long-term. Spawning habitat for steelhead and green sturgeon does not occur in the action area so no long-term effects on spawning habitat will occur.

Delta smelt Direct Effects

Adult Migration - The project will have no effect on delta smelt adult migration because all construction will occur out of water and at the top of the levee.

Spawning- The project will have no effect on delta smelt spawning because all construction will occur out of water and at the top of the levee.

Juvenile Rearing-The project will have no effect on delta smelt juvenile rearing and migration because all construction will occur out of water and at the top of the levee.

Delta Smelt Indirect Effects

Long-term changes in nearshore habitat are expected to have adverse effects on delta smelt with substantial impacts in the absence of any off-site habitat compensation measures. In cases where off-site compensation is implemented, adult habitat will be reduced in the short-term, and will not increase in the long-term. Possible delta smelt spawning habitat could occur with adverse long-term effects due to vegetation removal.

Green Sturgeon Direct Effects

Adult Migration - The project will have no effect on green sturgeon adult migration because all construction will occur out of water and at the top of the levee.

Spawning- The project will have no effect on green sturgeon spawning because all construction will occur out of water and at the top of the levee.

Juvenile Rearing-The project will have no effect on green sturgeon juvenile rearing and migration because all construction will occur out of water and at the top of the levee.

Green Sturgeon Indirect Effects

Long-term changes in nearshore habitat are expected to have adverse effects on adult steelhead, delta smelt, and green sturgeon with substantial impacts in the absence of any off-site habitat compensation measures. In cases where off-site compensation is implemented, adult habitat will be reduced in the short-term, and will not increase in the long-term. Spawning habitat for steelhead and green sturgeon does not occur in the action area so no long-term effects on spawning habitat will occur. However, possible delta smelt spawning habitat could occur with adverse long-term effects due to vegetation removal.

6.6.2 Closure Structure

CV Steelhead Direct Effects

Adult Migration - Increases in turbidity and suspended sediment can affect adult migration by displacing them from preferred habitat. Migrating adults have been reported to avoid high silt loads or cease migration when avoidance is not possible (Cordone and Kelley 1961). Construction activities would result in temporary noise and physical disturbance that may cause injury or death of fish by disrupting normal behaviors and potentially increasing the susceptibility of some individuals to predation. Noise and other disturbances from general construction activities (i.e. bank work, placing sheet piles for cofferdams) would be limited to the immediate construction area, affecting only small numbers of individuals.

Spawning – Behind the proposed gate closure structures does not provide ideal habitat for native fish species. The canals are connected to the San Joaquin River and Stockton Deep Water Shipping Channel (Stockton DWSC) and receives stormwater from the surrounding urban area along its entire extent. The canal is lined with riprap in many places. Private residences, many with docks on the north levee, follow the length of the canal, which originates approximately 2 miles from the project site and drains to the San Joaquin River and Stockton DWSC. The water column of the canal is infested with water hyacinth, a nonnative floating aquatic plant. While the canals are not hospitable for native species, some fish may stray into the canal.

Juvenile Rearing and Migration - Increases in turbidity and suspended sediment can affect adult migration by displacing them from preferred habitat. Migrating adults have been reported to avoid high silt loads or cease migration when avoidance is not possible (Cordone and Kelley 1961). Construction activities would result in temporary noise and physical disturbance that may cause injury or death of fish by disrupting normal behaviors and potentially increasing the susceptibility of some individuals to predation. Noise and other disturbances from general construction activities (i.e. bank work, placing sheet piles for cofferdams) would be limited to the immediate construction area, affecting only small numbers of individuals.

CV Steelhead Indirect Effects

Indirect effects of permanent closure structures could have potentially significant effects. During non-operational conditions overwater and in-water structures can alter underwater light conditions and provide potentially favorable holding conditions for adult fish, including species that prey on juvenile fishes. Permanent shading from the installation of piles and other structures could increase the number of predatory fish (e.g., striped bass, largemouth bass) holding in the project area and their ability to prey on juvenile listed fish species.

In the event that the closure structures need to be operational in a temporary emergency situation steelhead could potentially be exposed to adverse effects of being trapped behind the gates in poor quality habitat. Exposer to increased pollution, reductions in dissolved oxygen and predators could increase mortality of the species. The Corps proposes to continue discussions on mitigating for these effects in coordination with the resource agencies for design and operation to minimize gate closures.

Delta smelt Direct Effects

Adult Migration - Increases in turbidity and suspended sediment can affect adult migration by displacing them from preferred habitat. Migrating adults have been reported to avoid high silt loads or cease migration when avoidance is not possible (Cordone and Kelley 1961). Construction activities would result in temporary noise and physical disturbance that may cause injury or death of fish by disrupting normal behaviors and potentially increasing the susceptibility of some individuals to predation. Noise and other disturbances from general construction activities (i.e. bank work, placing sheet piles for cofferdams) would be limited to the immediate construction area, affecting only small numbers of individuals.

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Juvenile Rearing and Migration - Increases in turbidity and suspended sediment can affect adult migration by displacing them from preferred habitat. Migrating adults have been reported to avoid high silt loads or cease migration when avoidance is not possible (Cordone and Kelley 1961). Construction activities would result in temporary noise and physical disturbance that may cause injury or death of fish by disrupting normal behaviors and potentially increasing the susceptibility of some individuals to predation. Noise and other disturbances from general construction activities (i.e. bank work, placing sheet piles for cofferdams) would be limited to the immediate construction area, affecting only small numbers of individuals.

Delta smelt Indirect Effects

Indirect effects of permanent closure structures could have potentially significant effects. During non-operational conditions overwater and in-water structures can alter underwater light conditions and provide potentially favorable holding conditions for adult fish, including species that prey on juvenile fishes. Permanent shading from the installation of piles and other structures could increase the number of predatory fish (e.g., striped bass, largemouth bass) holding in the project area and their ability to prey on juvenile listed fish species.

In the event that the closure structures need to be operational in a temporary emergency situation steelhead could potentially be exposed to adverse effects of being trapped behind the gates in poor quality habitat. Exposer to increased pollution, reductions in dissolved oxygen and predators could increase mortality of the species. The Corps proposes to continue discussions on mitigating for these effects in coordination with the resource agencies for design and operation to minimize gate closures.

Green Sturgeon Direct Effects

Adult Migration - Increases in turbidity and suspended sediment can affect adult migration by displacing them from preferred habitat. Migrating adults have been reported to avoid high silt loads or cease migration when avoidance is not possible (Cordone and Kelley 1961). Construction activities would result in temporary noise and physical disturbance that may cause injury or death of fish by disrupting normal behaviors and potentially increasing the susceptibility of some individuals to predation. Noise and other disturbances from general construction activities (i.e. bank work, placing sheet piles for cofferdams) would be limited to the immediate construction area, affecting only small numbers of individuals.

Spawning - Behind the proposed gate closure structures does not provide ideal habitat for native fish species. The canals are connected to the San Joaquin River and Stockton Deep Water Shipping Channel (Stockton DWSC) and receives stormwater from the surrounding urban area along its entire extent. The canal is lined with riprap in many places. Private residences, many with docks on the north levee, follow the length of the canal, which originates approximately 2 miles from the project site and drains to the San Joaquin River and Stockton DWSC. The water column of the canal is infested with water hyacinth, a nonnative floating aquatic plant. While the canals are not hospitable for native species, some fish may stray into the canal.

Juvenile Rearing and Migration - Increases in turbidity and suspended sediment can affect adult migration by displacing them from preferred habitat. Migrating adults have been reported to avoid high silt loads or cease migration when avoidance is not possible (Cordone and Kelley 1961). Construction activities would result in temporary noise and physical disturbance that may cause injury or death of fish by disrupting normal behaviors and potentially increasing the susceptibility of some individuals to predation. Noise and other disturbances from general construction activities (i.e. bank work, placing sheet piles for cofferdams) would be limited to the immediate construction area, affecting only small numbers of individuals.

Green Sturgeon Indirect Effects

Indirect effects of permanent closure structures could have potentially significant effects. During non-operational conditions overwater and in-water structures can alter underwater light conditions and provide potentially favorable holding conditions for adult fish, including species that prey on juvenile fishes. Permanent shading from the installation of piles and other structures could increase the number of predatory fish (e.g., striped bass, largemouth bass) holding in the project area and their ability to prey on juvenile listed fish species.

In the event that the closure structures need to be operational in a temporary emergency situation steelhead could potentially be exposed to adverse effects of being trapped behind the gates in poor quality habitat. Exposer to increased pollution, reductions in dissolved oxygen and predators could increase mortality of the species. The Corps proposes to continue discussions on mitigating for these effects in coordination with the resource agencies for design and operation to minimize gate closures.

6.6.3 Vegetation ETL

CV Steelhead Direct Effects

Adult Migration - In the San Joaquin River, adult steelhead migrate upstream during most months of the year, beginning in July, peaking in September, and continuing through February or March. Adults use the river channel in the action area as a migration pathway to upstream spawning habitat, and may also use deep pools with instream cover as resting and holding habitat. The potential for construction related effects on migrating adult steelhead are not likely to affect CV steelhead adults because construction will avoid the primary migration period (December–July), will be restricted to out of water activities and will include implementation of the avoidance and minimization measures described in Section X.

Spawning – There is no known spawning habitat present in the lower Calaveras River action area. Steelhead spawn in late winter and late spring outside of the construction window; therefore, construction-related effects on steelhead spawning or their spawning habitat are not expected to occur.

Juvenile Rearing and Migration - Central Valley steelhead rear year-round in the cool upstream reaches of the mainstem Calaveras River and its major tributaries. Juveniles and smolts are most likely to be present in the action area during their downstream migration to the ocean, which may begin as early as December and peaks from January to May. Increases in turbidity and suspended sediment can affect adult migration by displacing them from preferred habitat. Migrating adults have been reported to avoid high silt loads or cease migration when avoidance is not possible (Cordone and Kelley 1961). Construction activities would result in temporary noise and physical disturbance that may cause injury or death of fish by disrupting normal behaviors and potentially increasing the susceptibility of some individuals to predation. Noise and other disturbances from general construction activities (i.e. bank work, placing sheet piles for cofferdams) would be limited to the immediate construction area, affecting only small numbers of individuals. Compliance with the ETL without a variance would result in the elimination of much of the existing beneficial SRA habitat which would adversely affect habitat important for juvenile rearing and migration.

Estuarine Areas - The estuarine areas component of critical habitat includes the physical and biological features required to support estuarine habitat and normal behavior. The project action could result in short term impacts to estuarine areas. Short term impacts to water quality may occur as the result of construction activities. Other habitat features such as instream woody material, overhanging shade, and shoreline vegetation would be impacted by construction activities. Short term losses to these habitat features would be expected due to the removal of SRA. The project may adversely affect the estuarine areas component of Central Valley Steelhead critical habitat.

<u>CV Steelhead Indirect Effects</u>

Aquatic habitats in the Lower San Joaquin River can be characterized as nearshore shaded riverine aquatic (SRA) cover, and open water (pelagic). Fish and other species use these habitats for growth, survival, and reproduction. Fish use these habitats differently, depending on species and life stage.

Nearshore areas support large and diverse fish and wildlife populations. These areas are important to fish for rearing and migration because they create attachment sites for aquatic insects (a food source for fish) and provide fish with shelter from predators. For example, juvenile Chinook salmon and steelhead rely on nearshore habitats as fry, smolt, or yearlings and to some extent as adults. In addition, vegetated nearshore habitat can also provide spawning areas for some fish species. Riparian vegetation is a component of nearshore and SRA cover and directly influences the quality of fish habitat. Its presence has an effect on cover, food, instream habitat complexity, streambank stability, and temperature regulation. Large woody debris usually originates from riparian trees and provides habitat complexity in aquatic environments, an essential component of fish habitat. The roots of riparian vegetation at the land-water interface and on adjacent berms provide streambank stability and cover for rearing fish (Meehan and Bjorn 1991).

Cover describes the physical components of a stream environment that provide shelter and hiding, resting, rearing, holding, and feeding areas for fish and other aquatic organisms. Gravel, cobbles, boulders, ledges, undercut banks, aquatic plants, saplings, brush, trees, and instream woody material (e.g., tree limbs, logs, and rootwads) all provide cover. The quantity and quality of cover for fish and aquatic invertebrates is a primary determinant of habitat availability and suitability. The occurrence of many aquatic species depends on the size, density, and continuity of suitable cover.

Riparian vegetation also provides shade and an insulating canopy that moderates water temperatures in both summer and winter. While the influence of shade on regulating river temperatures decreases as rivers become larger, the moderating effects of shade on nearshore water temperatures may be important to native fish species during the growing season. Riparian vegetation also influences the food chain of a stream, providing organic detritus and terrestrial insects. Terrestrial organisms falling from overhanging branches contribute to the food base of the aquatic community.

Compliance with the ETL without a variance would permanently remove up to 75% of woody riparian and SRA vegetation from the lower waterside of the levees in the action area and are likely to adversely affect CV steelhead critical habitat.

Delta smelt Direct Effects

Adult Migration - Adult delta smelt migrate upstream between December and January and spawn between January and July, with a peak in spawning activity between April and mid-May (Moyle 2002). Potential construction-related effects on adult delta smelt will be avoided or minimized by restricting in water construction activities to the August 1 through November 30 work window.

Spawning - Potential spawning habitat includes shallow channel edge waters in the Delta and lower San Joaquin River in the action area. As a result, potential construction-related effects include disruption of spawning activities, disturbance or mortality of eggs and newly hatched larvae, and alteration of spawning and incubation habitat. Effects on delta smelt spawning and incubation will be minimized by restricting in-water construction activities to the August 1 through November 30 work window, thereby avoiding the seasons when spawning is most likely to occur. Considering the limited duration and spatial extent of project actions, the small area of potential spawning habitat within the action area, and incorporation of best management practices, impacts should be minimal.

Juvenile Rearing and Migration - Juvenile delta smelt may be subject to disturbance or displacement caused by construction activities that increase noise, turbidity, and suspended sediment. Delta smelt may not be readily able to move away from channel or nearshore areas that are directly affected by construction activities (i.e., removal of vegetation). Larvae may be disrupted during summer months as they migrate downstream to rear in the Delta. Removal of riparian vegetation and IWM from the streambank may result in the loss of overhead and instream cover. Incidental take of delta smelt may occur from direct mortality or injury during a construction activity, or by the impairment of essential behavior patterns (i.e., feeding, escape from predators). In addition, physiological impairment could be caused by toxic substances (i.e., gasoline, lubricants, oil) entering the water. Construction-related effects on delta smelt rearing and migration will be minimized by restricting in-water construction activities to the August 1 through November 30 work window, thereby avoiding the seasons when these life stages are most likely to occur. Implementation of a spill prevention, control, and countermeasure plan will minimize the potential for toxic and hazardous spills or discharges to the river. Compliance with the ETL without a variance would result in the elimination of much of the existing beneficial SRA habitat which would adversely affect habitat important for juvenile rearing and migration.

Delta smelt Indirect Effects

Aquatic habitats in the Lower San Joaquin River can be characterized as nearshore shaded riverine aquatic (SRA) cover, and open water (pelagic). Fish and other species use these habitats for growth, survival, and reproduction. Fish use these habitats differently, depending on species and life stage.

Nearshore areas support large and diverse fish and wildlife populations. These areas are important to fish for rearing and migration because they create attachment sites for aquatic insects (a food source for fish) and provide fish with shelter from predators. For example, juvenile Chinook salmon and steelhead rely on nearshore habitats as fry, smolt, or yearlings and to some extent as adults. In addition, vegetated nearshore habitat can also provide spawning areas for some fish species. Riparian vegetation is a component of nearshore and SRA cover and directly influences the quality of fish habitat. Its presence has an effect on cover, food, instream habitat complexity, streambank stability, and temperature regulation. Large woody debris usually originates from riparian trees and provides habitat complexity in aquatic environments, an essential component of fish habitat. The roots of riparian vegetation at the land-water interface and on adjacent berms provide streambank stability and cover for rearing fish (Meehan and Bjorn 1991).

Cover describes the physical components of a stream environment that provide shelter and hiding, resting, rearing, holding, and feeding areas for fish and other aquatic organisms. Gravel, cobbles, boulders, ledges, undercut banks, aquatic plants, saplings, brush, trees, and instream woody material (e.g., tree limbs, logs, and rootwads) all provide cover. The quantity and quality of cover for fish and aquatic invertebrates is a primary determinant of habitat availability and suitability. The occurrence of many aquatic species depends on the size, density, and continuity of suitable cover.

Riparian vegetation also provides shade and an insulating canopy that moderates water temperatures in both summer and winter. While the influence of shade on regulating river temperatures decreases as rivers become larger, the moderating effects of shade on nearshore water temperatures may be important to native fish species during the growing season. Riparian vegetation also influences the food chain of a stream, providing organic detritus and terrestrial insects. Terrestrial organisms falling from overhanging branches contribute to the food base of the aquatic community.

Compliance with the ETL without a variance would permanently remove up to 75% of woody riparian and SRA vegetation from the lower waterside of the levees in the action area and are likely to adversely affect delta smelt critical habitat.

Green sturgeon Direct Effects

Adult Migration – Adults typically migrate upstream into rivers between late February and late July. Spawning occurs from March to July, with peak spawning from mid-April to mid-June. Green sturgeon are believed to spawn every 3 to 5 years, although recent evidence indicates that spawning may be as frequent as every 2 years (NMFS 2005c). The construction season of August 1 – November 30 would avoid potential green sturgeon migration on the San Joaquin River. Implementation of the ETL would not affect the migration of green sturgeon through the project area.

Spawning - There is likely no habitat suitable for green sturgeon spawning within the project area due to the local conditions which lack appropriate physical characteristics, such as appropriate water quality and substrate, to support spawning. However, anglers and game wardens indicate that sturgeon caught during March and April commonly expel milt or eggs during handling, indicating that spawning could be occurring upstream of the project area. Due to these conditions, it is unlikely for the project to adversely affect green sturgeon spawning within the project area.

Juvenile Rearing and Migration - Compliance with the ETL without a variance would result in the elimination of much of the existing beneficial SRA habitat which would adversely affect habitat important for juvenile rearing and migration.

Food Resources

The food resources component of critical habitat includes water, air, light, minerals, and other nutritional or physiological requirements for individual and population growth and normal behavior. The project could result in short term impacts to the available food through clearing of SRA habitat. The project may adversely affect the food resources component of green sturgeon critical habitat.

Substrate Type and Size

The substrate type and size component of critical habitat includes substrates suitable for egg deposition and development (*e.g.*, bedrock sills and shelves, cobble and gravel, or hard clean sand, with interstices or irregular surfaces to "collect" eggs and provide protection from predators, and free of excessive silt and debris that could smother eggs during incubation), larval development (*e.g.*, substrates with interstices or voids providing refuge from predators and from high flow conditions), and subadults and adults (*e.g.*, substrates for holding and spawning). The project would not affect the substrate type and size component of green sturgeon critical habitat.

Water flow

The water flow component of critical habitat includes amount and timing necessary for normal behavior, growth and viability of all life stages. The project action would result in impacts to the amount of water available to green sturgeon during closure gate operations. The project may adversely impact the water flow component of green sturgeon critical habitat.

Water quality

The water quality component of critical habitat includes characteristics such as temperature, salinity, and oxygen content necessary for normal behavior, growth and viability of all life stages. The project could result in short term impacts to water quality due to closure gate operations The project may adversely impact the water quality component of green sturgeon critical habitat.

Migratory corridor

The migratory corridor component of critical habitat includes habitat without physical, chemical, or biological features that would impact access, survival, or viability of any life stage. The project could result in short term impacts to the migratory corridor due to closure gate operations The project may adversely impact the migratory corridor component of green sturgeon critical habitat.

Water depth

The water depth component of critical habitat includes diverse depths necessary for shelter, foraging, and migration of juvenile, subadult, and adult life stages. The project features of the closure gate operations during high flow events would result in changes to water depth. The project may adversely impact the water depth component of green sturgeon critical habitat.

Sediment quality

The sediment quality component of critical habitat includes chemical and physical components necessary for normal behavior, growth, and viability of all life stages. The project could result in impacts to sediment quality resulting from temporary gate closures during high flow events. The project may adversely affect the sediment quality component of green sturgeon critical habitat.

Green sturgeon Indirect Effects

Aquatic habitats in the Lower San Joaquin River can be characterized as nearshore shaded riverine aquatic (SRA) cover, and open water (pelagic). Fish and other species use these habitats for growth, survival, and reproduction. Fish use these habitats differently, depending on species and life stage.

Nearshore areas support large and diverse fish and wildlife populations. These areas are important to fish for rearing and migration because they create attachment sites for aquatic insects (a food source for fish) and provide fish with shelter from predators. In addition, vegetated nearshore habitat can also provide spawning areas for some fish species. Riparian vegetation is a component of nearshore and SRA cover and directly influences the quality of fish habitat. Its presence has an effect on cover, food, instream habitat complexity, streambank stability, and temperature regulation. Large woody debris usually originates from riparian trees and provides habitat complexity in aquatic environments, an essential component of fish habitat. The roots of riparian vegetation at the land-water interface and on adjacent berms provide streambank stability and cover for rearing fish (Meehan and Bjorn 1991).

Cover describes the physical components of a stream environment that provide shelter and hiding, resting, rearing, holding, and feeding areas for fish and other aquatic organisms. Gravel, cobbles, boulders, ledges, undercut banks, aquatic plants, saplings, brush, trees, and instream woody material (e.g., tree limbs, logs, and rootwads) all provide cover. The quantity and quality of cover for fish and aquatic invertebrates is a primary determinant of habitat availability and suitability. The occurrence of many aquatic species depends on the size, density, and continuity of suitable cover.

Riparian vegetation also provides shade and an insulating canopy that moderates water temperatures in both summer and winter. While the influence of shade on regulating river temperatures decreases as rivers become larger, the moderating effects of shade on nearshore water temperatures may be important to native fish species during the growing season. Riparian vegetation also influences the food chain of a stream, providing organic detritus and terrestrial insects. Terrestrial organisms falling from overhanging branches contribute to the food base of the aquatic community.

Compliance with the ETL without a variance would permanently remove up to 75% of woody riparian and SRA vegetation from the lower waterside of the levees in the action area and are likely to adversely affect green sturgeon critical habitat.

6.7 Cumulative Effects

The ESA requires NMFS and USFWS to evaluate the cumulative effects of proposed actions on listed species and designated critical habitat, and to consider cumulative effects in formulating Biological Opinions (USFWS and NMFS 2002a). The ESA defines cumulative effects as "those effects of future State or private actions, not involving Federal activities that are reasonably certain to occur within the action area" of the proposed action subject to consultation (USFWS and NMFS 2002b). Future Federal actions that are unrelated to the proposed action are not considered in this section because they require separate consultation pursuant to Section 7 of the Federal ESA. Federal actions, including hatcheries, fisheries, and land management activities are, therefore, not included. For the purposes of this BA, the area of cumulative effects analysis is defined as the San Joaquin watershed.

A number of other commercial and private activities, including hatchery operations, timber harvest, recreation, as well as urban and rural development, could potentially affect listed species in the San Joaquin basin. Levee maintenance activities by state agencies and local reclamation districts are likely to continue. Ongoing non-federal activities that affect listed salmonids, green sturgeon, delta smelt, VELB, GGS and their habitat, will likely continue in the short-term, at intensities similar to those of recent years. However, some activities associated with the State's proposed Central Valley Flood Protection Plan or state or local efforts to implement the ETL could result in increased effects on listed species. The extent and pace of those activities are not yet known.

Cumulative effects may also include non-federal rock revetment projects. Some non-federal rock revetment projects carried out by State or local agencies (e.g., reclamation districts) that do not fill wetlands or occur above the ordinary high water line will not need Section 404 (Clean Water Act) permits from the Corps and resulting Section 7 (ESA) consultation, but any effects on listed species should be addressed through Section 10 of the ESA. These types of actions are possible at many locations throughout the LSJRFS study area, but are not included as part of the current project.

Potential cumulative effects on fish may include any continuing or future non-federal diversions of water that may entrain adult or larval fish or that may incrementally decrease outflows, thus changing the position of habitat for these species. Water diversions through intakes serving numerous small, private agricultural lands and duck clubs in the Delta, upstream of the Delta, and in Suisun Bay contribute to these cumulative effects. These diversions also include municipal and industrial uses and power production. Several new diversions are in various stages of action. The introduction of exotic species may also occur under numerous circumstances. Exotic species can displace native species that provide food for larval fish.

Potential cumulative effects on all species addressed in this BA could include: wave action in the water channel caused by boats that may degrade riparian and wetland habitat and erode banks; dumping of domestic and industrial garbage; land uses that result in increased discharges of pesticides, herbicides, oil, and other contaminants; and conversion of riparian areas for urban development. In addition, routine vegetation clearing and mowing associated with agricultural practices may affect or remove habitat for the VELB and GGS.

6.8 Effects of the Proposed Action on EFH

The Magnuson-Stevens Fishery Conservation and Management Act (MSA), as amended (U.S.C. 180 et seq.), requires that Essential Fish Habitat (EFH) be identified and described in Federal fishery management plans. Federal action agencies must consult with NMFS on any activity that they fund, permit, or carry out that may adversely affect EFH. NMFS is required to provide EFH conservation and enhancement recommendations to the Federal action agencies.

EFH of Pacific salmon, pursuant to section 305 (b) (2) of the MSA, require appropriate determinations for EFH as either: (1) will not adversely effect, or (2) may adversely affect. Important components of EFH for Chinook salmon spawning, rearing, and migration include:

- Freshwater spawning sites with water quantity and quality conditions and substrate supporting spawning, incubation and larval development;

- Freshwater rearing sites with:

    - Water quantity and floodplain connectivity to form and maintain physical habitat conditions and support juvenile growth and mobility;

- Water quality and forage supporting juvenile development; and
- Natural cover such as shade, submerged and overhanging large wood, log jams and beaver dams, aquatic vegetation, large rocks and boulders, side channels, and undercut banks.

• Freshwater migration corridors free of obstruction and excessive predation with water quantity and quality conditions and natural cover such as submerged and overhanging large wood, aquatic vegetation, large rocks and boulders, side channels, and undercut banks supporting juvenile and adult mobility and survival.

• Estuarine areas free of obstruction and excessive predation with:

- Water quality, water quantity, and salinity conditions supporting juvenile and adult physiological transitions between fresh- and saltwater;
- Natural cover such as submerged and overhanging large wood, aquatic vegetation, large rocks and boulders, side channels; and
- Juvenile and adult forage, including aquatic invertebrates and fishes, supporting growth and maturation.

The project's action area includes habitats that have been designated as EFH for Chinook salmon, a major contributor to Pacific Coast salmon fisheries. The Pacific Coast salmon fishery EFH extends along the Pacific Coast from Washington to Point Conception in California. Freshwater EFH includes all habitat currently and historically accessible to salmon and is based on descriptions of habitat used by Coho and Chinook salmon. The EFH excludes areas above naturally occurring barriers such as waterfalls, which have been present for several hundred years, and impassible dams identified on large rivers (62 FR 2343–2383).

The following analysis of EFH does not include quantitative effects by fish species, just the species habitat as defined in the MSA. Project effects to EFH for Chinook salmon spawning, rearing, and migration are discussed by important component and further discussed by the structural features approach and the vegetation variance approach:

<u>Structural Features Analysis</u>:

<u>Cutoff Walls</u>:

Substrate Composition – Installation of cut-off walls would not result in short or long term alteration of substrate composition. Bank armoring would only be in very limited areas along the Delta Front above the ordinary high water mark and would be in the form of pre-existing rock replenishment. The project would not adversely affect substrate composition.

Water Quality- Installation of cut-off walls would not result in short or long term water quality impacts due to no in water construction activities. Additionally, implementation of BMPs would further minimize impacts to water quality during construction. The project would not adversely affect water quality.

Water Quantity, Depth, and Velocity – Installation of cut-off walls would not result in short or long term water quantity, depth, and velocity impacts due to no in water construction activities. The project would not adversely affect water quantity, depth, and velocity.

Channel Gradient and Stability – Installation of cut-off walls would not impact the channel gradient. The project would not result in short or long-term change to channel stability as the result of cutoff wall construction. The project would not adversely affect channel stability.

Food – Installation of cut-off walls would not alter the short or long-term amount of terrestrial input because repair actions would not result in a decrease in near shore and aquatic vegetation. The project would not adversely affect the available food.

Cover and Habitat Complexity – Installation of cut-off walls could impact the available cover and habitat complexity as the result of removal of the top 15 feet of available vegetation at the top of the levee for cutoff wall construction. The project may adversely affect available cover and habitat complexity.

Space – Installation of cut-off walls would not impact the available space for EFH due to no changes in shoreline as the result of top of levee cutoff wall construction. The project would not adversely affect available space.

Access and Passage – Installation of cut-off walls would not adversely affect access or fish passage to any waterbody critical to the species life cycle.

Habitat Connectivity – Installation of cut-off walls would not adversely affect connectivity between any habitats critical to the species life cycle.

Overall the cutoff wall project element will not adversely affect Pacific Coast salmon EFH.

<u>Closure Gate Structures</u>:

Substrate Composition – Installation and operation of the Closure Gate Structures would result in short and long term alteration of substrate composition within the construction footprint. The project may adversely affect substrate composition.

Water Quality- Installation and operation of the Closure Gate Structures could result in short-term water quality impacts due to in water construction. Implementation of BMPs would minimize impacts to water quality during construction. The project may adversely affect water quality.

Water Quantity, Depth, and Velocity – Installation and operation of the Closure Gate Structures would result in changes to water quantity, depth and velocity during active gate closures. Water quantity, depth, and velocity would be altered during high flow events at high tide and then would return to normal conditions during outgoing tide and low tide (See Project Description, Section 3 for actual gate operation procedures). The project would adversely affect water quantity, depth, and velocity during the intermittent gate closures at high tide high flow events.

Channel Gradient and Stability – Installation and operation of the Closure Gate Structures would not result in short or long-term change to channel stability or gradiant as the result of gate closure construction. The project would not affect channel stability or gradient.

Food – Installation and operation of the Closure Gate Structures would alter the short and long-term amount of terrestrial input because repair actions would result in a decrease in near shore and aquatic vegetation. Planted vegetation generally compensates for habitat losses over the lifetime of the project; however, short term (i.e. typically the first 5 years following construction) deficits could occur. Onsite mitigative features could result in long term gains in nearshore habitat and terrestrial input. The project may adversely affect the available food.

Cover and Habitat Complexity – Installation and operation of the Closure Gate Structures could impact the available cover and habitat complexity as the result of temporary removal of instream woody material and aquatic/terrestrial vegetation during construction activities. This impact is mitigated in part through the installation of instream woody material and planting of native vegetation; however, impacts will not be fully compensated until planted vegetation develops. The project may adversely affect available cover and habitat complexity.

Space – Installation and operation of the Closure Gate Structures could impact the available space for EFH due to changes in open water and shallow water habitat as the result of the gate closures and associated floodwalls. The project may adversely affect available space.

Access and Passage – Installation and operation of the Closure Gate Structures would adversely affect access or fish passage to critical habitat for green sturgeon and delta smelt. However, access and fish passage would only be limited during intermittent winter high flow events during extreme high tides.

Habitat Connectivity – Installation and operation of the Closure Gate Structures would adversely affect connectivity between habitats critical to the species life cycle.

However, access and fish passage would only be limited during intermittent winter high flow events during extreme high tides.

Overall the Closure Gate Structure project element will adversely affect Pacific Coast salmon EFH.

Vegetation ETL Analysis:

Substrate Composition – Implementation of the vegetation ETL with or without a variance would not result in short and long term alteration of substrate composition within the construction footprint. The project would not adversely affect substrate composition.

Water Quality- Implementation of the vegetation ETL with or without a variance could result in short and long-term water quality impacts due to vegetation removal. Implementation of BMPs would minimize impacts to water quality during construction. The project may adversely affect water quality.

Water Quantity, Depth, and Velocity – Implementation of the vegetation ETL with or without a variance would not result in short or long-term changes to water quantity, depth and velocity during ETL compliance. Terrestrial vegetation only would be removed for compliance. The project would not adversely affect water quantity, depth, and velocity.

Channel Gradient and Stability – Implementation of the vegetation ETL without a variance would not result in short or long-term change to channel stability or gradiant as the result of gate closure construction. The project would not affect channel stability or gradient.

Food – Implementation of the vegetation ETL without a variance would alter the short and long-term amount of terrestrial input and would result in elimination of near shore vegetation. However, during PED levee reaches would be evaluated for a vegetation variance that could allow up to 50% of vegetation to remain on the lower half of the water slopes of the levees and out 15 feet. The project may adversely affect the available food.

Cover and Habitat Complexity – Implementation of the vegetation ETL without a variance could impact the available cover and habitat complexity as the result of permanent removal of instream woody material and aquatic/terrestrial vegetation during construction activities. Due to compliance with the Vegetation ETL through implementation of waterside vegetation-free zones, EFH is expected to show a long-term negative response to project actions in the Lower San Joaquin River project area over the lifetime of the project. Negative EFH response would be most likely be associated with (1) removal of vegetation which would eliminate long-term growth of SRA (overhanging shade). However, during PED levee reaches would be evaluated for a vegetation variance that could allow up to 50% of vegetation to remain on the lower half of the water slopes of the levees and out 15 feet. The project may adversely affect available cover and habitat complexity.

Space – Implementation of the vegetation ETL without a variance would not impact the available space for EFH. The project would not adversely affect available space.

Access and Passage – Implementation of the vegetation ETL without a variance would not adversely affect access or fish passage to any water body critical to the species life cycle.

Habitat Connectivity – Implementation of the vegetation ETL without a variance would adversely affect connectivity between habitats critical to the species life cycle. Floodplain habitat would be degraded by vegetation removal.

Overall the vegetation removal associated with ETL compliance will adversely affect Pacific Coast salmon EFH.

7.0 ESA - CONCLUSIONS AND EFFECTS DETERMINATION FOR LISTED SPECIES AND CRITICAL HABITAT

7.1 Valley Elderberry Longhorn Beetle

In cases where work occurs within 20 feet of elderberry shrubs not affected by the project action, the contractor will be instructed to avoid impacts to shrubs as much as possible. Potential impacts to shrubs will be addressed according to the guidelines outlined in Section 3.9.1. In consideration of this information, the project actions are unlikely to result in long-term habitat losses to valley elderberry longhorn beetle, as long as the applicable conservation, avoidance, and compensation measures are implemented. However, project actions <u>are likely to adversely affect</u> valley elderberry longhorn beetles due to potential take during construction, primarily as a result of transplanting elderberry shrubs from the construction footprint to an area outside the project footprint or an off-site conservation area.

7.2 Giant Garter Snake

To minimize the potential for adverse effects, GGS habitat will be designated as an environmentally sensitive area delineated with signs or fencing, and if possible, avoided by all construction personnel. Applicable conservation and avoidance measures will be applied as outlined in Section 3.9.2 will also be implemented.

In consideration of the above information, the project actions are likely to result in short-term construction related temporary aquatic and upland habitat impacts to GGS. The temporary effects could be minimized by implementation of the construction avoidance, minimization, and compensation measures. Despite avoidance, minimization, and compensation measures, construction and O&M activities <u>are likely to adversely affect</u> GGS due to the potential take during construction activities in aquatic and upland GGS habitat.

7.3 Fish

Project effects on listed fish species include construction-associated activities as well as alteration of the habitat features along the water channels, most of which is designated critical habitat for Central Valley steelhead, delta smelt, and sDPS green sturgeon. Construction and operations and maintenance (O&M) activities may result in localized incidental take due to disturbance, displacement, or impairment of feeding or other essential behaviors of delta smelt, steelhead, and green sturgeon. Injury or mortality of juvenile steelhead, green sturgeon and delta smelt could occur, if individuals are unable to readily move away from channel or nearshore areas directly affected by construction activities. Accidental discharge of toxic substances during construction could cause physiological impairment or mortality of listed fish and other aquatic species at or immediately downstream of project sites. Other potential stressors include noise, suspended sediment, turbidity, and sediment deposition generated during in-water construction activities. These effects could also occur in areas downstream of project sites, because noise and sediment may be propagated downstream. Restricting in-water activities to the August 1 through November 30 work window, and implementing BMPs, will minimize the potential for adverse effects.

Long-term project effects on the habitat of listed fish species include alteration of river hydraulics, channel access, and instream and overhead cover. Project implementation will result in temporary and permanent changes to Fourteenmile Slough and Smith Canal as a result of the closure structures. Permanent removal of shrub and woody riparian vegetation along the banks eliminates key constituents of SRA habitat at the time of construction and into the future.

In consideration of the above information, the project actions are likely to result in long-term habitat losses for Central Valley steelhead, delta smelt, and green sturgeon. Proposed conservation measures, including avoidance, minimization and compensation, are identified in Section 3.9.3 subsection of “Conservation Measures Including Avoidance, Minimization, and Compensation”, and include BMPs, work windows, minimization of vegetation removal through design and/or application of an ETL 1110-2-583 variance. Compensation for habitat losses is also proposed as part of the project, and may include additional design features (such as a setback levee, or waterside enhancements) where possible to be incorporated as part of the project. Any outstanding losses will be mitigated through the purchase of appropriate quantities of shaded-riverine credits and mosaic wetlands (riparian) credits from Service-approved conservation banks.

While the impacts from proposed actions will be avoided and minimized where possible, it has been determined that the project actions may affect and are likely to adversely affect delta smelt, Central Valley steelhead and sDPS green sturgeon. We have proposed appropriate compensation for habitat impacts that could not be addressed through avoidance, minimization and conservation measures.

7.4 Critical Habitat

Section 7 of the Endangered Species Act requires that Federal agencies ensure, in consultation with the USFWS, that any action they authorize, fund, or carry out is not likely to result in the destruction or adverse modification of critical habitat. Effects on critical habitat are discussed for each species in Section 6.0. Based on those assessments, project actions may reduce the value of critical habitat for listed species due to alteration of river hydraulics, channel access, and reduced instream and overhead cover. Due to these potential effects the following determinations have been made:

- Are likely to adversely affect designated critical habitat for San Joaquin River Central Valley steelhead and green sturgeon;
- Are likely to adversely affect designated critical habitat for delta smelt within the Lower San Joaquin River project area.

8.0 ESSENTIAL FISH HABITAT - EFFECTS DETERMINATION

Effects on EFH have been identified and discussed in Section 6.8. Long-term project effects on the EFH for Pacific salmon include alteration of river hydraulics, channel access due to installation and operation of closure systems, and also loss of shoreline habitat value due to removal of instream and overhead vegetative cover. Project implementation will result in temporary and permanent changes to Fourteenmile Slough and Smith Canal as a result of the closure structures. Permanent removal of shrub and woody riparian vegetation along the banks eliminates key constituents of SRA habitat at the time of construction and into the future. These project actions have been determined to adversely affect EFH for Pacific Coast salmon.

To help offset the loss of habitat value from these actions, mitigation is proposed to minimize these impacts during design and provide compensation for any resultant loss through additional habitat enhancement at other sites (setback levee or construction of other shoreline features) or purchase of appropriate credits from Service-approved conservation banks. In addition, the design and operation of the closure structures will be developed in coordination with resource agencies to minimize any effects on fish species including salmon.

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United States Department of the Interior

FISH AND WILDLIFE SERVICE

Sacramento Fish and Wildlife Office
2800 Cottage Way, Room W-2605
Sacramento, California 95825

February 5, 2015

Document Number: 150205034334

David J. Colby
US Army Corps of Engineers
1325 J Street
Sacramento, CA 95814

Subject: Species List for Lower San Joaquin River BA

Dear: Mr. Colby

We are sending this official species list in response to your February 5, 2015 request for information about endangered and threatened species. The list covers the California counties and/or U.S. Geological Survey 7½ minute quad or quads you requested.

Our database was developed primarily to assist Federal agencies that are consulting with us. Therefore, our lists include all of the sensitive species that have been found in a certain area *and also ones that may be affected by projects in the area*. For example, a fish may be on the list for a quad if it lives somewhere downstream from that quad. Birds are included even if they only migrate through an area. In other words, we include all of the species we want people to consider when they do something that affects the environment.

Please read Important Information About Your Species List (below). It explains how we made the list and describes your responsibilities under the Endangered Species Act.

Our database is constantly updated as species are proposed, listed and delisted. If you address proposed and candidate species in your planning, this should not be a problem. However, we recommend that you get an updated list every 90 days. That would be May 06, 2015.

Please contact us if your project may affect endangered or threatened species or if you have any questions about the attached list or your responsibilities under the Endangered Species Act. A list of Endangered Species Program contacts can be found http://www.fws.gov/sacramento/es/Branch-Contacts/es_branch-contacts.htm.

Endangered Species Division

U.S. Fish & Wildlife Service

Sacramento Fish & Wildlife Office

Federal Endangered and Threatened Species that Occur in or may be Affected by Projects in the Counties and/or U.S.G.S. 7 1/2 Minute Quads you requested

Document Number: 150205034208

Current as of: February 5, 2015

Quad Lists

Listed Species

Invertebrates

Branchinecta lynchi
vernal pool fairy shrimp (T)

Desmocerus californicus dimorphus
valley elderberry longhorn beetle (T)

Lepidurus packardi
vernal pool tadpole shrimp (E)

Fish

Acipenser medirostris
green sturgeon (T) (NMFS)

Hypomesus transpacificus
Critical habitat, delta smelt (X)
delta smelt (T)

Oncorhynchus mykiss
Central Valley steelhead (T) (NMFS)
Critical habitat, Central Valley steelhead (X) (NMFS)

Oncorhynchus tshawytscha
Central Valley spring-run chinook salmon (T) (NMFS)
winter-run chinook salmon, Sacramento River (E) (NMFS)

Amphibians

Ambystoma californiense
California tiger salamander, central population (T)

Rana draytonii
California red-legged frog (T)

Reptiles

Thamnophis gigas
giant garter snake (T)

Mammals

Sylvilagus bachmani riparius
riparian brush rabbit (E)

Plants

Cordylanthus palmatus
palmate-bracted bird's-beak (E)

Quads Containing Listed, Proposed or Candidate Species:

STOCKTON WEST (462A)

County Lists

No county species lists requested.

Key:

(E) *Endangered* - Listed as being in danger of extinction.

(T) *Threatened* - Listed as likely to become endangered within the foreseeable future.

(P) *Proposed* - Officially proposed in the Federal Register for listing as endangered or threatened.

(NMFS) Species under the Jurisdiction of the National Oceanic & Atmospheric Administration Fisheries Service. Consult with them directly about these species.

Critical Habitat - Area essential to the conservation of a species.

(PX) *Proposed Critical Habitat* - The species is already listed. Critical habitat is being proposed for it.

(C) *Candidate* - Candidate to become a proposed species.

(V) Vacated by a court order. Not currently in effect. Being reviewed by the Service.

(X) *Critical Habitat* designated for this species

Important Information About Your Species List

How We Make Species Lists

We store information about endangered and threatened species lists by U.S. Geological Survey 7½ minute quads. The United States is divided into these quads, which are about the size of San Francisco.

The animals on your species list are ones that occur within, **or may be affected by** projects within, the quads covered by the list.

- Fish and other aquatic species appear on your list if they are in the same watershed as your quad or if water use in your quad might affect them.
- Amphibians will be on the list for a quad or county if pesticides applied in that area may be carried to their habitat by air currents.
- Birds are shown regardless of whether they are resident or migratory. Relevant birds on the county list should be considered regardless of whether they appear on a quad list.

Plants

Any plants on your list are ones that have actually been observed in the area covered by the list. Plants may exist in an area without ever having been detected there. You can find out what's in the surrounding quads through the California Native Plant Society's online Inventory of Rare and Endangered Plants.

Surveying

Some of the species on your list may not be affected by your project. A trained biologist and/or botanist, familiar with the habitat requirements of the species on your list, should determine whether they or habitats suitable for them may be affected by your project. We recommend that your surveys include any proposed and candidate species on your list. See our Protocol and Recovery Permits pages.

For plant surveys, we recommend using the Guidelines for Conducting and Reporting

U.S. Fish & Wildlife Service

Sacramento Fish & Wildlife Office

Federal Endangered and Threatened Species that Occur in or may be Affected by Projects in the Counties and/or U.S.G.S. 7 1/2 Minute Quads you requested

Document Number: 150205034232

Current as of: February 5, 2015

Quad Lists

Listed Species

Invertebrates

Branchinecta lynchi
vernal pool fairy shrimp (T)

Desmocerus californicus dimorphus
valley elderberry longhorn beetle (T)

Lepidurus packardi
vernal pool tadpole shrimp (E)

Fish

Acipenser medirostris
green sturgeon (T) (NMFS)

Hypomesus transpacificus
delta smelt (T)

Oncorhynchus mykiss
Central Valley steelhead (T) (NMFS)
Critical habitat, Central Valley steelhead (X) (NMFS)

Oncorhynchus tshawytscha
Central Valley spring-run chinook salmon (T) (NMFS)
winter-run chinook salmon, Sacramento River (E) (NMFS)

Amphibians

Ambystoma californiense
California tiger salamander, central population (T)

Rana draytonii
California red-legged frog (T)

Reptiles

Thamnophis gigas
giant garter snake (T)

Mammals

Sylvilagus bachmani riparius
riparian brush rabbit (E)

Quads Containing Listed, Proposed or Candidate Species:

STOCKTON EAST (461B)

County Lists

No county species lists requested.

Key:

(E) *Endangered* - Listed as being in danger of extinction.

(T) *Threatened* - Listed as likely to become endangered within the foreseeable future.

(P) *Proposed* - Officially proposed in the Federal Register for listing as endangered or threatened.

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(C) *Candidate* - Candidate to become a proposed species.

(V) Vacated by a court order. Not currently in effect. Being reviewed by the Service.

(X) *Critical Habitat* designated for this species

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Plants

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Surveying

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Your Responsibilities Under the Endangered Species Act

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U.S. Fish & Wildlife Service

Sacramento Fish & Wildlife Office

Federal Endangered and Threatened Species that Occur in or may be Affected by Projects in the Counties and/or U.S.G.S. 7 1/2 Minute Quads you requested

Document Number: 150205033911

Current as of: February 5, 2015

Quad Lists

Listed Species

Invertebrates

Branchinecta lynchi
vernal pool fairy shrimp (T)

Desmocerus californicus dimorphus
valley elderberry longhorn beetle (T)

Lepidurus packardi
vernal pool tadpole shrimp (E)

Fish

Acipenser medirostris
green sturgeon (T) (NMFS)

Hypomesus transpacificus
Critical habitat, delta smelt (X)
delta smelt (T)

Oncorhynchus mykiss
Central Valley steelhead (T) (NMFS)
Critical habitat, Central Valley steelhead (X) (NMFS)

Oncorhynchus tshawytscha
Central Valley spring-run chinook salmon (T) (NMFS)
winter-run chinook salmon, Sacramento River (E) (NMFS)

Amphibians

Ambystoma californiense
California tiger salamander, central population (T)

Rana draytonii
California red-legged frog (T)

Reptiles

Thamnophis gigas
giant garter snake (T)

Mammals

Sylvilagus bachmani riparius
riparian brush rabbit (E)

Plants

Castilleja campestris ssp. succulenta
succulent (=fleshy) owl's-clover (T)

Quads Containing Listed, Proposed or Candidate Species:

LODI SOUTH (479D)

County Lists

No county species lists requested.

Key:

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(T) *Threatened* - Listed as likely to become endangered within the foreseeable future.

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Sacramento Fish & Wildlife Office

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Document Number: 150205034133

Current as of: February 5, 2015

Quad Lists

Listed Species

Invertebrates

Branchinecta lynchi
vernal pool fairy shrimp (T)

Desmocerus californicus dimorphus
valley elderberry longhorn beetle (T)

Lepidurus packardi
vernal pool tadpole shrimp (E)

Fish

Hypomesus transpacificus
delta smelt (T)

Oncorhynchus mykiss
Central Valley steelhead (T) (NMFS)
Critical habitat, Central Valley steelhead (X) (NMFS)

Oncorhynchus tshawytscha
Central Valley spring-run chinook salmon (T) (NMFS)
winter-run chinook salmon, Sacramento River (E) (NMFS)

Amphibians

Ambystoma californiense
California tiger salamander, central population (T)

Rana draytonii
California red-legged frog (T)

Reptiles

Thamnophis gigas
giant garter snake (T)

Mammals

Sylvilagus bachmani riparius
riparian brush rabbit (E)

Plants

Castilleja campestris ssp. succulenta
succulent (=fleshy) owl's-clover (T)

Quads Containing Listed, Proposed or Candidate Species:

WATERLOO (478C)

Official Version

County Lists

No county species lists requested.

Key:

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(T) *Threatened* - Listed as likely to become endangered within the foreseeable future.

(P) *Proposed* - Officially proposed in the Federal Register for listing as endangered or threatened.

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U.S. Fish & Wildlife Service

Sacramento Fish & Wildlife Office

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Document Number: 150205034304

Current as of: February 5, 2015

Quad Lists

Listed Species

Invertebrates

Branchinecta lynchi
vernal pool fairy shrimp (T)

Desmocerus californicus dimorphus
valley elderberry longhorn beetle (T)

Lepidurus packardi
vernal pool tadpole shrimp (E)

Fish

Acipenser medirostris
green sturgeon (T) (NMFS)

Hypomesus transpacificus
Critical habitat, delta smelt (X)
delta smelt (T)

Oncorhynchus mykiss
Central Valley steelhead (T) (NMFS)
Critical habitat, Central Valley steelhead (X) (NMFS)

Oncorhynchus tshawytscha
Central Valley spring-run chinook salmon (T) (NMFS)
winter-run chinook salmon, Sacramento River (E) (NMFS)

Amphibians

Ambystoma californiense
California tiger salamander, central population (T)

Rana draytonii
California red-legged frog (T)

Reptiles

Thamnophis gigas
giant garter snake (T)

Birds

Coccyzus americanus occidentalis
Western yellow-billed cuckoo (T)

Mammals

Sylvilagus bachmani riparius
riparian brush rabbit (E)

Official Version

Quads Containing Listed, Proposed or Candidate Species:

LATHROP (462D)

County Lists

No county species lists requested.

Key:

(E) *Endangered* - Listed as being in danger of extinction.

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Sacramento Fish & Wildlife Office

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Document Number: 150205034334

Current as of: February 5, 2015

Quad Lists

Listed Species

Invertebrates

Branchinecta lynchi
vernal pool fairy shrimp (T)

Desmocerus californicus dimorphus
valley elderberry longhorn beetle (T)

Lepidurus packardi
vernal pool tadpole shrimp (E)

Fish

Acipenser medirostris
green sturgeon (T) (NMFS)

Hypomesus transpacificus
delta smelt (T)

Oncorhynchus mykiss
Central Valley steelhead (T) (NMFS)

Oncorhynchus tshawytscha
Central Valley spring-run chinook salmon (T) (NMFS)
winter-run chinook salmon, Sacramento River (E) (NMFS)

Amphibians

Ambystoma californiense
California tiger salamander, central population (T)

Rana draytonii
California red-legged frog (T)

Reptiles

Thamnophis gigas
giant garter snake (T)

Birds

Coccyzus americanus occidentalis
Western yellow-billed cuckoo (T)

Quads Containing Listed, Proposed or Candidate Species:

MANTECA (461C)

County Lists

No county species lists requested.

Official Version

Key:

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Your Responsibilities Under the Endangered Species Act

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United States Department of the Interior

FISH AND WILDLIFE SERVICE
Sacramento Fish and Wildlife Office
2800 Cottage Way, Room W-2605
Sacramento, California 95825

Conservation Guidelines for the
Valley Elderberry Longhorn Beetle
9 July 1999

The following guidelines have been issued by the U.S. Fish and Wildlife Service (Service) to assist Federal agencies and non-federal project applicants needing incidental take authorization through a section 7 consultation or a section 10(a)(1)(B) permit in developing measures to avoid and minimize adverse effects on the valley elderberry longhorn beetle. The Service will revise these guidelines as needed in the future. The most recently issued version of these guidelines should be used in developing all projects and habitat restoration plans. The survey and monitoring procedures described below are designed to avoid any adverse effects to the valley elderberry longhorn beetle. Thus a recovery permit is not needed to survey for the beetle or its habitat or to monitor conservation areas. If you are interested in a recovery permit for research purposes please call the Service's Regional Office at (503) 231-2063.

Background Information

The valley elderberry longhorn beetle (Desmocerus californicus dimorphus), was listed as a threatened species on August 8, 1980 (Federal Register 45: 52803-52807). This animal is fully protected under the Endangered Species Act of 1973, as amended (16 U.S.C. 1531 et seq.). The valley elderberry longhorn beetle (beetle) is completely dependent on its host plant, elderberry (Sambucus species), which is a common component of the remaining riparian forests and adjacent upland habitats of California's Central Valley. Use of the elderberry by the beetle, a wood borer, is rarely apparent. Frequently, the only exterior evidence of the elderberry's use by the beetle is an exit hole created by the larva just prior to the pupal stage. The life cycle takes one or two years to complete. The animal spends most of its life in the larval stage, living within the stems of an elderberry plant. Adult emergence is from late March through June, about the same time the elderberry produces flowers. The adult stage is short-lived. Further information on the life history, ecology, behavior, and distribution of the beetle can be found in a report by Barr (1991) and the recovery plan for the beetle (USFWS 1984).

Surveys

Proposed project sites within the range of the valley elderberry longhorn beetle should be surveyed for the presence of the beetle and its elderberry host plant by a qualified biologist. The beetle's range extends throughout California's Central Valley and associated foothills from about the 3,000-foot elevation contour on the east and the watershed of the Central Valley on the west (Figure 1). All or portions of 31 counties are included: Alameda, Amador, Butte, Calaveras, Colusa, Contra Costa, El Dorado, Fresno, Glenn, Kern, Kings, Lake, Madera, Mariposa, Merced, Napa, Nevada, Placer, Sacramento, San Benito, San Joaquin, San Luis Obispo, Shasta, Solano, Stanislaus, Sutter, Tehama, Tulare, Tuolumne, Yolo, Yuba.

If elderberry plants with one or more stems measuring 1.0 inch or greater in diameter at ground level occur on or adjacent to the proposed project site, or are otherwise located where they may be directly or indirectly affected by the proposed action, minimization measures which include planting replacement habitat (conservation planting) are required (Table 1).

All elderberry shrubs with one or more stems measuring 1.0 inch or greater in diameter at ground level that occur on or adjacent to a proposed project site must be thoroughly searched for beetle exit holes (external evidence of beetle presence). In addition, all elderberry stems one inch or greater in diameter at ground level must be tallied by diameter size class (Table 1). As outlined in Table 1, the numbers of elderberry seedlings/cuttings and associated riparian native trees/shrubs to be planted as replacement habitat are determined by stem size class of affected elderberry shrubs, presence or absence of exit holes, and whether a proposed project lies in a riparian or non-riparian area.

Elderberry plants with no stems measuring 1.0 inch or greater in diameter at ground level are unlikely to be habitat for the beetle because of their small size and/or immaturity. Therefore, no minimization measures are required for removal of elderberry plants with no stems measuring 1.0 inch or greater in diameter at ground level with no exit holes. Surveys are valid for a period of two years.

Avoid and Protect Habitat Whenever Possible

Project sites that do not contain beetle habitat are preferred. If suitable habitat for the beetle occurs on the project site, or within close proximity where beetles will be affected by the project, these areas must be designated as avoidance areas and must be protected from disturbance during the construction and operation of the project. When possible, projects should be designed such that avoidance areas are connected with adjacent habitat to prevent fragmentation and isolation of beetle populations. Any beetle habitat that cannot be avoided as described below should be considered impacted and appropriate minimization measures should be proposed as described below.

Avoidance: Establishment and Maintenance of a Buffer Zone

Complete avoidance (i.e., no adverse effects) may be assumed when a 100-foot (or wider) buffer is established and maintained around elderberry plants containing stems measuring 1.0 inch or greater in diameter at ground level. Firebreaks may not be included in the buffer zone. In buffer areas construction-related disturbance should be minimized, and any damaged area should be promptly restored following construction. The Service must be consulted before any disturbances within the buffer area are considered. In addition, the Service must be provided with a map identifying the avoidance area and written details describing avoidance measures.

Protective Measures

1. Fence and flag all areas to be avoided during construction activities. In areas where encroachment on the 100-foot buffer has been approved by the Service, provide a minimum setback of at least 20 feet from the dripline of each elderberry plant.

2. Brief contractors on the need to avoid damaging the elderberry plants and the possible penalties for not complying with these requirements.

3. Erect signs every 50 feet along the edge of the avoidance area with the following information: "This area is habitat of the valley elderberry longhorn beetle, a threatened species, and must not be disturbed. This species is protected by the Endangered Species Act of 1973, as amended. Violators are subject to prosecution, fines, and imprisonment." The signs should be clearly readable from a distance of 20 feet, and must be maintained for the duration of construction.

4. Instruct work crews about the status of the beetle and the need to protect its elderberry host plant.

Restoration and Maintenance

1. Restore any damage done to the buffer area (area within 100 feet of elderberry plants) during construction. Provide erosion control and re-vegetate with appropriate native plants.

2. Buffer areas must continue to be protected after construction from adverse effects of the project. Measures such as fencing, signs, weeding, and trash removal are usually appropriate.

3. No insecticides, herbicides, fertilizers, or other chemicals that might harm the beetle or its host plant should be used in the buffer areas, or within 100 feet of any elderberry plant with one or more stems measuring 1.0 inch or greater in diameter at ground level.

4. The applicant must provide a written description of how the buffer areas are to be restored, protected, and maintained after construction is completed.

5. Mowing of grasses/ground cover may occur from July through April to reduce fire hazard. No mowing should occur within five (5) feet of elderberry plant stems. Mowing must be done in a manner that avoids damaging plants (e.g., stripping away bark through careless use of mowing/trimming equipment).

Transplant Elderberry Plants That Cannot Be Avoided

Elderberry plants must be transplanted if they can not be avoided by the proposed project. All elderberry plants with one or more stems measuring 1.0 inch or greater in diameter at ground level must be transplanted to a conservation area (see below). At the Service's discretion, a plant that is unlikely to survive transplantation because of poor condition or location, or a plant that would be extremely difficult to move because of access problems, may be exempted from transplantation. In cases where transplantation is not possible the minimization ratios in Table 1 may be increased to offset the additional habitat loss.

Trimming of elderberry plants (e.g., pruning along roadways, bike paths, or trails) with one or more stems 1.0 inch or greater in diameter at ground level, may result in take of beetles. Therefore, trimming is subject to appropriate minimization measures as outlined in Table 1.

1. Monitor. A qualified biologist (monitor) must be on-site for the duration of the transplanting of the elderberry plants to insure that no unauthorized take of the valley elderberry longhorn beetle occurs. If unauthorized take occurs, the monitor must have the authority to stop work until corrective measures have been completed. The monitor must immediately report any unauthorized take of the beetle or its habitat to the Service and to the California Department of Fish and Game.

2. Timing. Transplant elderberry plants when the plants are dormant, approximately November through the first two weeks in February, after they have lost their leaves. Transplanting during the non-growing season will reduce shock to the plant and increase transplantation success.

3. Transplanting Procedure.

   a. Cut the plant back 3 to 6 feet from the ground or to 50 percent of its height (whichever is taller) by removing branches and stems above this height. The trunk and all stems measuring 1.0 inch or greater in diameter at ground level should be replanted. Any leaves remaining on the plant should be removed.

b. Excavate a hole of adequate size to receive the transplant.

c. Excavate the plant using a Vemeer spade, backhoe, front end loader, or other suitable equipment, taking as much of the root ball as possible, and replant immediately at the conservation area. Move the plant only by the root ball. If the plant is to be moved and transplanted off site, secure the root ball with wire and wrap it with burlap. Dampen the burlap with water, as necessary, to keep the root ball wet. Do not let the roots dry out. Care should be taken to ensure that the soil is not dislodged from around the roots of the transplant. If the site receiving the transplant does not have adequate soil moisture, pre-wet the soil a day or two before transplantation.

d. The planting area must be at least 1,800 square feet for each elderberry transplant. The root ball should be planted so that its top is level with the existing ground. Compact the soil sufficiently so that settlement does not occur. As many as five (5) additional elderberry plantings (cuttings or seedlings) and up to five (5) associated native species plantings (see below) may also be planted within the 1,800 square foot area with the transplant. The transplant and each new planting should have its own watering basin measuring at least three (3) feet in diameter. Watering basins should have a continuous berm measuring approximately eight (8) inches wide at the base and six (6) inches high.

e. Saturate the soil with water. Do not use fertilizers or other supplements or paint the tips of stems with pruning substances, as the effects of these compounds on the beetle are unknown.

f. Monitor to ascertain if additional watering is necessary. If the soil is sandy and well-drained, plants may need to be watered weekly or twice monthly. If the soil is clayey and poorly-drained, it may not be necessary to water after the initial saturation. However, most transplants require watering through the first summer. A drip watering system and timer is ideal. However, in situations where this is not possible, a water truck or other apparatus may be used.

Plant Additional Seedlings or Cuttings

Each elderberry stem measuring 1.0 inch or greater in diameter at ground level that is adversely affected (i.e., transplanted or destroyed) must be replaced, in the conservation area, with elderberry seedlings or cuttings at a ratio ranging from 1:1 to 8:1 (new plantings to affected stems). Minimization ratios are listed and explained in Table 1. Stock of either seedlings or cuttings should be obtained from local sources. Cuttings may be obtained from the plants to be transplanted if the project site is in the vicinity of the conservation area. If the Service determines that the elderberry plants on the proposed project site are unsuitable candidates for transplanting, the Service may allow the applicant to plant seedlings or cuttings at higher than the stated ratios in Table 1 for each elderberry plant that cannot be transplanted.

Plant Associated Native Species

Studies have found that the beetle is more abundant in dense native plant communities with a mature overstory and a mixed understory. Therefore, a mix of native plants associated with the elderberry plants at the project site or similar sites will be planted at ratios ranging from 1:1 to 2:1 [native tree/plant species to each elderberry seedling or cutting (see Table 1)]. These native plantings must be monitored with the same survival criteria used for the elderberry seedlings (see below). Stock of saplings, cuttings, and seedlings should be obtained from local sources. If the parent stock is obtained from a distance greater than one mile from the conservation area, approval by the Service of the native plant donor sites must be obtained prior to initiation of the revegetation work. Planting or seeding the conservation area with native herbaceous species is encouraged. Establishing native grasses and forbs may discourage unwanted non-native species from becoming established or persisting at the conservation area. Only stock from local sources should be used.

Examples

Example 1
The project will adversely affect beetle habitat on a vacant lot on the land side of a river levee. This levee now separates beetle habitat on the vacant lot from extant Great Valley Mixed Riparian Forest (Holland 1986) adjacent to the river. However, it is clear that the beetle habitat located on the vacant lot was part of a more extensive mixed riparian forest ecosystem extending farther from the river's edge prior to agricultural development and levee construction. Therefore, the beetle habitat on site is considered riparian. A total of two elderberry plants with at least one stem measuring 1.0 inch or greater in diameter at ground level will be affected by the proposed action. The two plants have a total of 15 stems measuring over 1.0 inch. No exit holes were found on either plant. Ten of the stems are between 1.0 and 3.0 inches in diameter and five of the stems are greater than 5.0 inches in diameter. The conservation area is suited for riparian forest habitat. Associated natives adjacent to the conservation area are box elder (Acer negundo californica), walnut (Juglans californica var. hindsii), sycamore (Platanus racemosa), cottonwood (Populus fremontii), willow (Salix gooddingii and S. laevigata), white alder (Alnus rhombifolia), ash (Fraxinus latifolia), button willow (Cephalanthus occidentalis), and wild grape (Vitis californica).

Minimization (based on ratios in Table 1):

- Transplant the two elderberry plants that will be affected to the conservation area.

- Plant 40 elderberry rooted cuttings (10 affected stems compensated at 2:1 ratio and 5 affected stems compensated at 4:1 ratio, cuttings planted:stems affected)

- Plant 40 associated native species (ratio of associated natives to elderberry plantings is 1:1 in areas with no exit holes):

  5 saplings each of box elder, sycamore, and cottonwood
  5 willow seedlings
  5 white alder seedlings
  5 saplings each of walnut and ash
  3 California button willow
  2 wild grape vines
  Total: 40 associated native species

- Total area required is a minimum of 1,800 sq. ft. for one to five elderberry seedlings and up to 5 associated natives. Since, a total of 80 plants must be planted (40 elderberries and 40 associated natives), a total of 0.33 acre (14,400 square feet) will be required for conservation plantings. The conservation area will be seeded and planted with native grasses and forbs, and closely monitored and maintained throughout the monitoring period.

Example 2
The project will adversely affect beetle habitat in Blue Oak Woodland (Holland 1986). One elderberry plant with at least one stem measuring 1.0 inch or greater in diameter at ground level will be affected by the proposed action. The plant has a total of 10 stems measuring over 1.0 inch. Exit holes were found on the plant. Five of the stems are between 1.0 and 3.0 inches in diameter and five of the stems are between 3.0 and 5.0 inches in diameter. The conservation area is suited for elderberry savanna (non-riparian habitat). Associated natives adjacent to the conservation area are willow (Salix species), blue oak (Quercus douglasii), interior live oak (Q. wislizenii), sycamore, poison oak (Toxicodendron diversilobum), and wild grape.

Minimization (based on ratios in Table 1):

- Transplant the one elderberry plant that will be affected to the conservation area.

- Plant 30 elderberry seedlings (5 affected stems compensated at 2:1 ratio and 5 affected stems compensated at 4:1 ratio, cuttings planted:stems affected)

• Plant 60 associated native species (ratio of associated natives to elderberry plantings is 2:1 in areas with exit holes):

20 saplings of blue oak, 20 saplings of sycamore, and 20 saplings of willow, and seed and plant with a mixture of native grasses and forbs

• Total area required is a minimum of 1,800 sq. ft. for one to five elderberry seedlings and up to 5 associated natives. Since, a total of 90 plants must be planted (30 elderberries and 60 associated natives), a total of 0.37 acre (16,200 square feet) will be required for conservation plantings. The conservation area will be seeded and planted with native grasses and forbs, and closely monitored and maintained throughout the monitoring period.

Conservation Area—Provide Habitat for the Beetle in Perpetuity

The conservation area is distinct from the avoidance area (though the two may adjoin), and serves to receive and protect the transplanted elderberry plants and the elderberry and other native plantings. The Service may accept proposals for off-site conservation areas where appropriate.

1. Size. The conservation area must provide at least 1,800 square feet for each transplanted elderberry plant. As many as 10 conservation plantings (i.e., elderberry cuttings or seedlings and/or associated native plants) may be planted within the 1800 square foot area with each transplanted elderberry. An additional 1,800 square feet shall be provided for every additional 10 conservation plants. Each planting should have its own watering basin measuring approximately three feet in diameter. Watering basins should be constructed with a continuous berm measuring approximately eight inches wide at the base and six inches high.

   The planting density specified above is primarily for riparian forest habitats or other habitats with naturally dense cover. If the conservation area is an open habitat (i.e., elderberry savanna, oak woodland) more area may be needed for the required plantings. Contact the Service for assistance if the above planting recommendations are not appropriate for the proposed conservation area.

   No area to be maintained as a firebreak may be counted as conservation area. Like the avoidance area, the conservation area should connect with adjacent habitat wherever possible, to prevent isolation of beetle populations.

   Depending on adjacent land use, a buffer area may also be needed between the conservation area and the adjacent lands. For example, herbicides and pesticides are often used on orchards or vineyards. These chemicals may drift or runoff onto the conservation area if an adequate buffer area is not provided.

2. Long-Term Protection. The conservation area must be protected in perpetuity as habitat for the valley elderberry longhorn beetle. A conservation easement or deed restrictions to protect the conservation area must be arranged. Conservation areas may be transferred to a resource agency or appropriate private organization for long-term management. The Service must be provided with a map and written details identifying the conservation area; and the applicant must receive approval from the Service that the conservation area is acceptable prior to initiating the conservation program. A true, recorded copy of the deed transfer, conservation easement, or deed restrictions protecting the conservation area in perpetuity must be provided to the Service before project implementation.

   Adequate funds must be provided to ensure that the conservation area is managed in perpetuity. The applicant must dedicate an endowment fund for this purpose, and designate the party or entity that will be responsible for long-term management of the conservation area. The Service must be provided with written documentation that funding and management of the conservation area (items 3-8 above) will be provided in perpetuity.

3. Weed Control. Weeds and other plants that are not native to the conservation area must be removed at least once a year, or at the discretion of the Service and the California Department of Fish and Game. Mechanical means should be used; herbicides are prohibited unless approved by the Service.

4. Pesticide and Toxicant Control. Measures must be taken to insure that no pesticides, herbicides, fertilizers, or other chemical agents enter the conservation area. No spraying of these agents must be done within one 100 feet of the area, or if they have the potential to drift, flow, or be washed into the area in the opinion of biologists or law enforcement personnel from the Service or the California Department of Fish and Game.

5. Litter Control. No dumping of trash or other material may occur within the conservation area. Any trash or other foreign material found deposited within the conservation area must be removed within 10 working days of discovery.

6. Fencing. Permanent fencing must be placed completely around the conservation area to prevent unauthorized entry by off-road vehicles, equestrians, and other parties that might damage or destroy the habitat of the beetle, unless approved by the Service. The applicant must receive written approval from the Service that the fencing is acceptable prior to initiation of the conservation program. The fence must be maintained in perpetuity, and must be repaired/replaced within 10 working days if it is found to be damaged. Some conservation areas may be made available to the public for appropriate recreational and educational opportunities with written approval from the Service. In

these cases appropriate fencing and signs informing the public of the beetle’s threatened status and its natural history and ecology should be used and maintained in perpetuity.

7. Signs. A minimum of two prominent signs must be placed and maintained in perpetuity at the conservation area, unless otherwise approved by the Service. The signs should note that the site is habitat of the federally threatened valley elderberry longhorn beetle and, if appropriate, include information on the beetle's natural history and ecology. The signs must be approved by the Service. The signs must be repaired or replaced within 10 working days if they are found to be damaged or destroyed.

Monitoring

The population of valley elderberry longhorn beetles, the general condition of the conservation area, and the condition of the elderberry and associated native plantings in the conservation area must be monitored over a period of either ten (10) consecutive years or for seven (7) years over a 15-year period. The applicant may elect either 10 years of monitoring, with surveys and reports every year; or 15 years of monitoring, with surveys and reports on years 1, 2, 3, 5, 7, 10, and 15. The conservation plan provided by the applicant must state which monitoring schedule will be followed. No change in monitoring schedule will be accepted after the project is initiated. If conservation planting is done in stages (i.e., not all planting is implemented in the same time period), each stage of conservation planting will have a different start date for the required monitoring time.

Surveys. In any survey year, a minimum of two site visits between February 14 and June 30 of each year must be made by a qualified biologist. Surveys must include:

1. A population census of the adult beetles, including the number of beetles observed, their condition, behavior, and their precise locations. Visual counts must be used; mark-recapture or other methods involving handling or harassment must not be used.

2. A census of beetle exit holes in elderberry stems, noting their precise locations and estimated ages.

3. An evaluation of the elderberry plants and associated native plants on the site, and on the conservation area, if disjunct, including the number of plants, their size and condition.

4. An evaluation of the adequacy of the fencing, signs, and weed control efforts in the avoidance and conservation areas.

5. A general assessment of the habitat, including any real or potential threats to the beetle and its host plants, such as erosion, fire, excessive grazing, off-road vehicle use, vandalism, excessive weed growth, etc.

The materials and methods to be used in the monitoring studies must be reviewed and approved by the Service. All appropriate Federal permits must be obtained prior to initiating the field studies.

Reports. A written report, presenting and analyzing the data from the project monitoring, must be prepared by a qualified biologist in each of the years in which a monitoring survey is required. Copies of the report must be submitted by December 31 of the same year to the Service (Chief of Endangered Species, Sacramento Fish and Wildlife Office), and the Department of Fish and Game (Supervisor, Environmental Services, Department of Fish and Game, 1416 Ninth Street, Sacramento, California 95814; and Staff Zoologist, California Natural Diversity Data Base, Department of Fish and Game, 1220 S Street, Sacramento, California 95814). The report must explicitly address the status and progress of the transplanted and planted elderberry and associated native plants and trees, as well as any failings of the conservation plan and the steps taken to correct them. Any observations of beetles or fresh exit holes must be noted. Copies of original field notes, raw data, and photographs of the conservation area must be included with the report. A vicinity map of the site and maps showing where the individual adult beetles and exit holes were observed must be included. For the elderberry and associated native plants, the survival rate, condition, and size of the plants must be analyzed. Real and likely future threats must be addressed along with suggested remedies and preventative measures (e.g. limiting public access, more frequent removal of invasive non-native vegetation, etc.).

A copy of each monitoring report, along with the original field notes, photographs, correspondence, and all other pertinent material, should be deposited at the California Academy of Sciences (Librarian, California Academy of Sciences, Golden Gate Park, San Francisco, CA 94118) by December 31 of the year that monitoring is done and the report is prepared. The Service's Sacramento Fish and Wildlife Office should be provided with a copy of the receipt from the Academy library acknowledging receipt of the material, or the library catalog number assigned to it.

Access. Biologists and law enforcement personnel from the California Department of Fish and Game and the Service must be given complete access to the project site to monitor transplanting activities. Personnel from both these agencies must be given complete access to the project and the conservation area to monitor the beetle and its habitat in perpetuity.

Success Criteria

A minimum survival rate of at least 60 percent of the elderberry plants and 60 percent of the associated native plants must be maintained throughout the monitoring period. Within one year of discovery that survival has dropped below 60 percent, the applicant must replace failed plantings to bring survival above this level. The Service will make any determination as to the applicant's replacement responsibilities arising from circumstances beyond its control, such as plants damaged or killed as a result of severe flooding or vandalism.

Service Contact

These guidelines were prepared by the Endangered Species Division of the Service's Sacramento Fish and Wildlife Office. If you have questions regarding these guidelines or to request a copy of the most recent guidelines, telephone (916) 414-6600, or write to:

U.S. Fish and Wildlife Service
Ecological Services
2800 Cottage Way, W-2605
Sacramento, CA 95825

Figure 1: Range of the Valley Elderberry Longhorn Beetle

Literature Cited

Barr, C. B. 1991. The distribution, habitat, and status of the valley elderberry longhorn beetle Desmocerus californicus dimorphus. U.S. Fish and Wildlife Service; Sacramento, California.

Holland, R.F. 1986. Preliminary descriptions of the terrestrial natural communities of California. Unpublished Report. State of California, The Resources Agency, Department of Fish and Game, Natural Heritage Division, Sacramento, California.

USFWS. 1980. Listing the valley elderberry longhorn beetle as a threatened species with critical habitat. Federal Register 45:52803-52807.

USFWS. 1984. Recovery plan for the valley elderberry longhorn beetle. U.S. Fish and Wildlife Service, Endangered Species Program; Portland, Oregon.

Table 1: Minimization ratios based on location (riparian vs. non-riparian), stem diameter of affected elderberry plants at ground level, and presence or absence of exit holes.

Location	Stems (maximum diameter at ground level)	Exit Holes on Shrub Y/N (quantify)[1]	Elderberry Seedling Ratio[2]	Associated Native Plant Ratio[3]
non-riparian	stems > = 1" & = < 3"	No:	1:1	1:1
		Yes:	2:1	2:1
non-riparian	stems > 3" & < 5"	No:	2:1	1:1
		Yes:	4:1	2:1
non-riparian	stems >= 5"	No:	3:1	1:1
		Yes:	6:1	2:1
riparian	stems > = 1" & = < 3"	No:	2:1	1:1
		Yes:	4:1	2:1
riparian	stems > 3" & < 5"	No:	3:1	1:1
		Yes:	6:1	2:1
riparian	stems > = 5"	No:	4:1	1:1
		Yes:	8:1	2:1

[1] All stems measuring one inch or greater in diameter at ground level on a single shrub are considered occupied when exit holes are present anywhere on the shrub.

[2] Ratios in the *Elderberry Seedling Ratio* column correspond to the number of cuttings or seedlings to be planted per elderberry stem (one inch or greater in diameter at ground level) affected by a project.

[3] Ratios in the *Associated Native Plant Ratio* column correspond to the number of associated native species to be planted per elderberry (seedling or cutting) planted.

Appendix D

Mapbooks

D-1 Project Footprint Mapbook

D-2 Elderberry Location Mapbook

Appendix D

D-1 Project Footprint Mapbook

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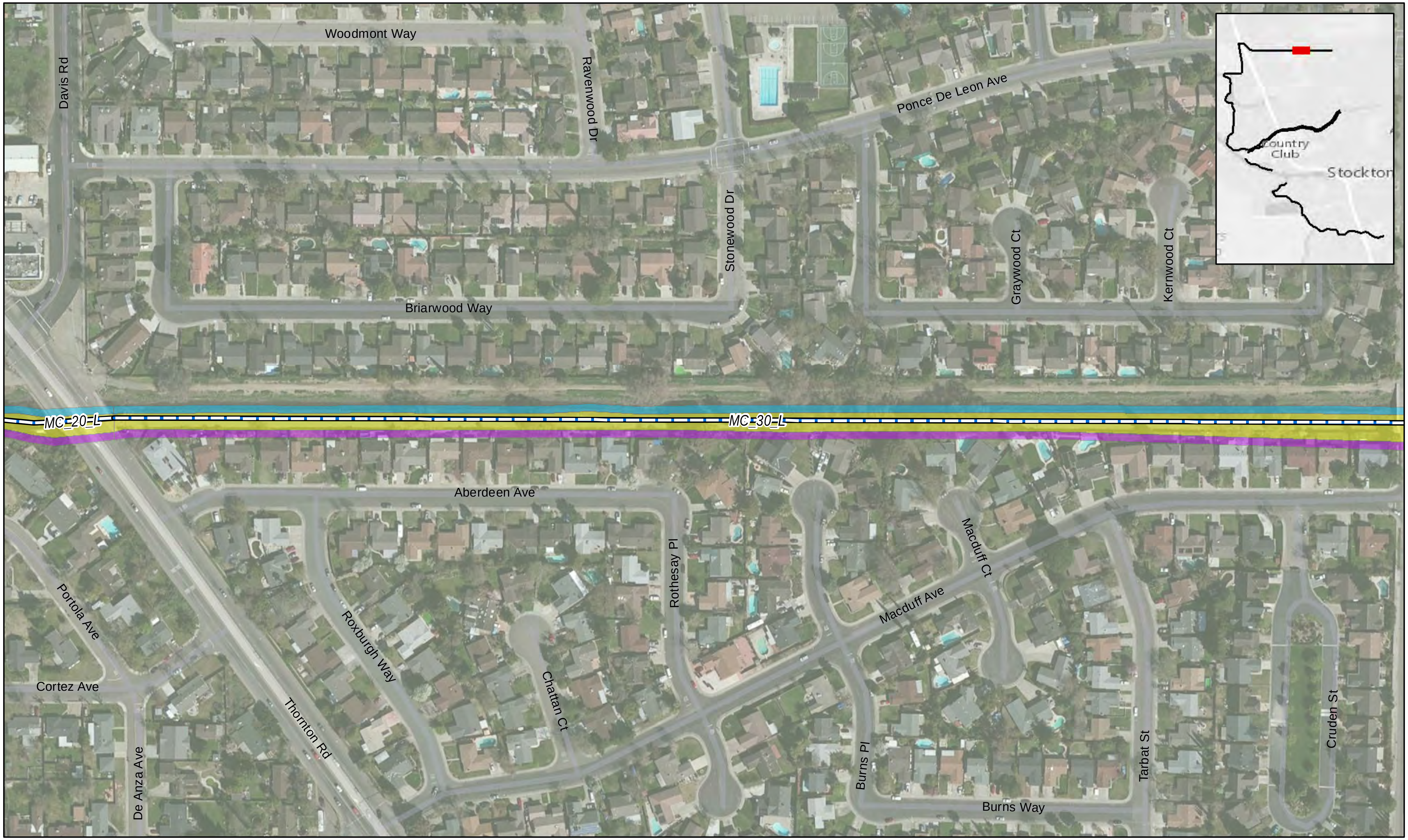

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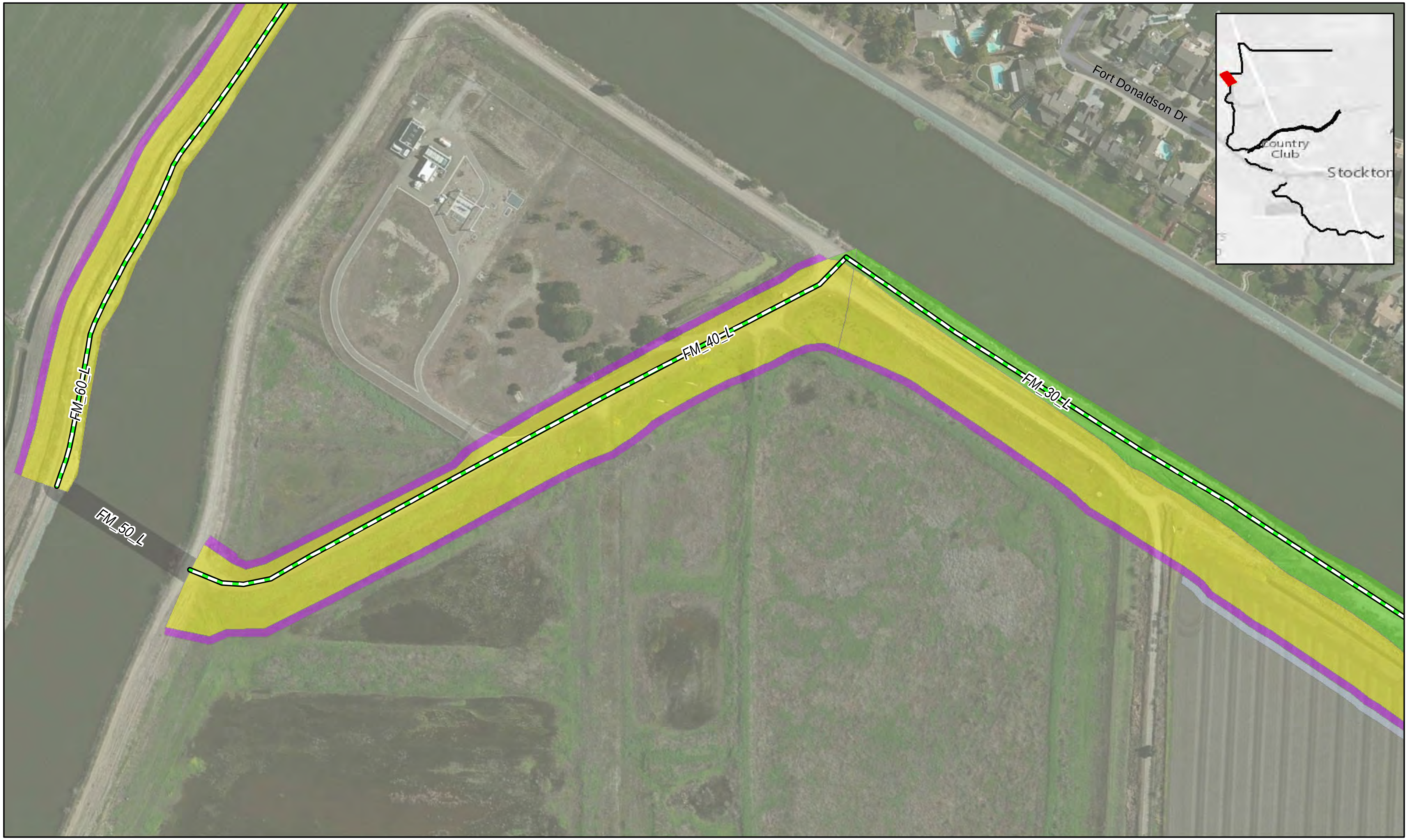

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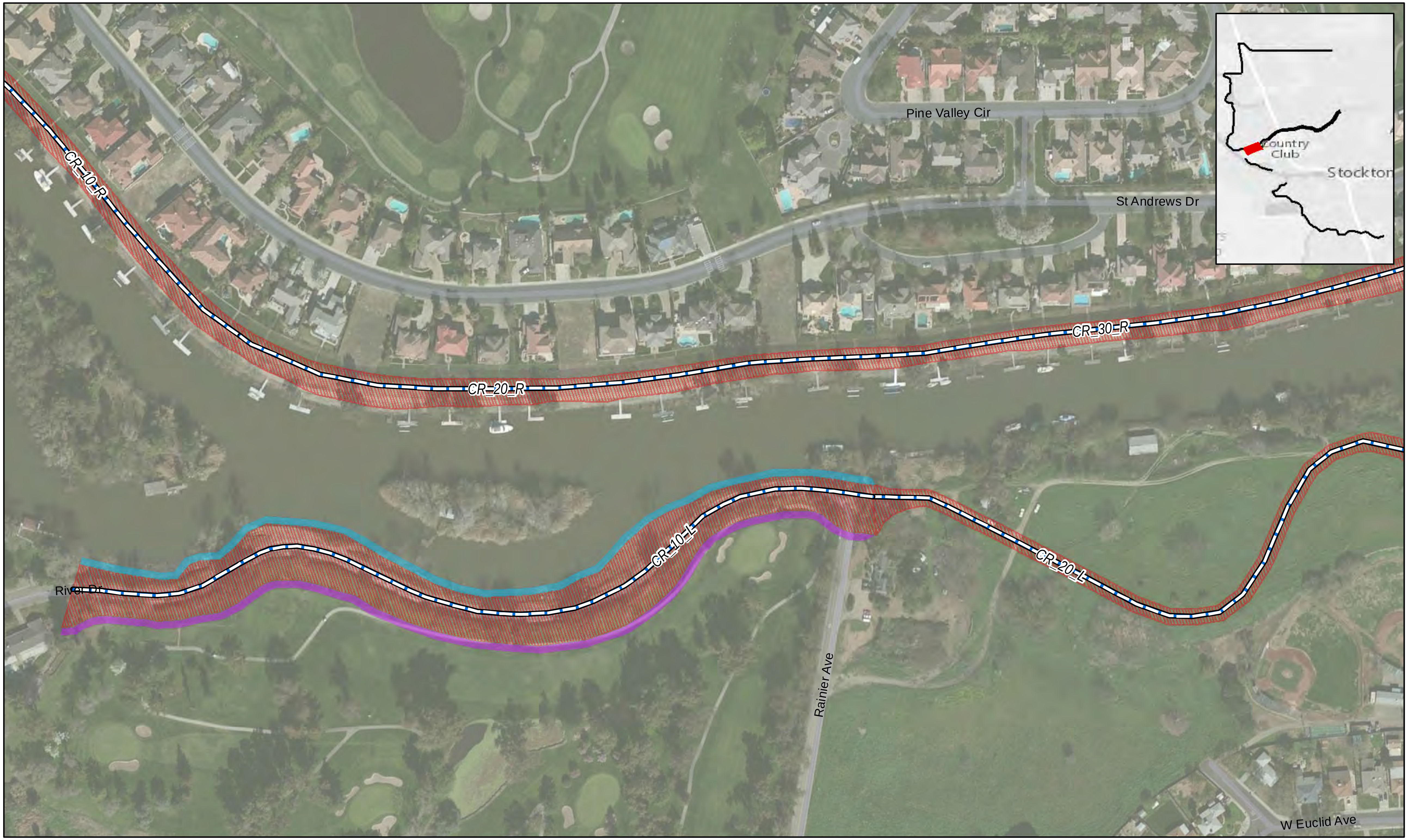

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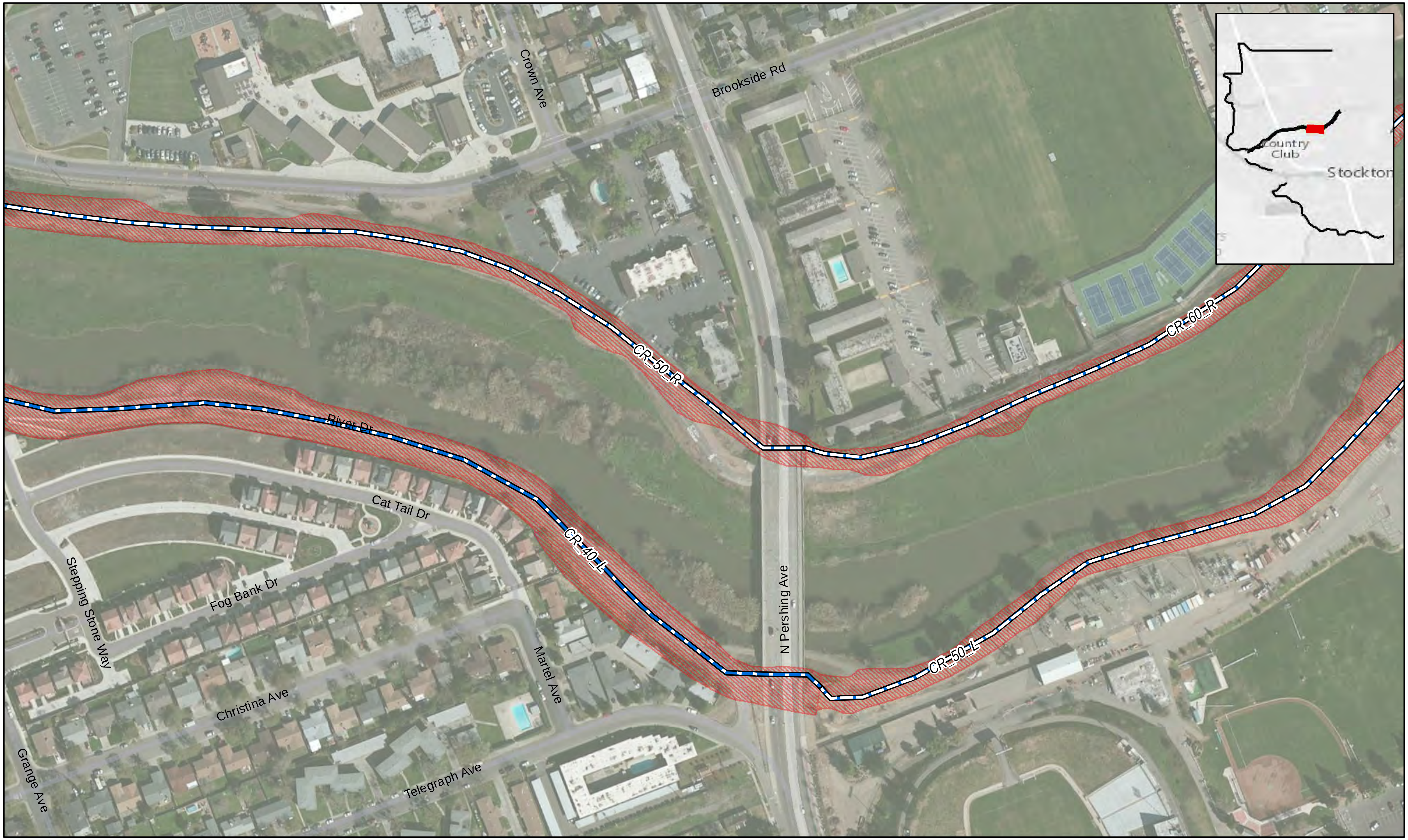

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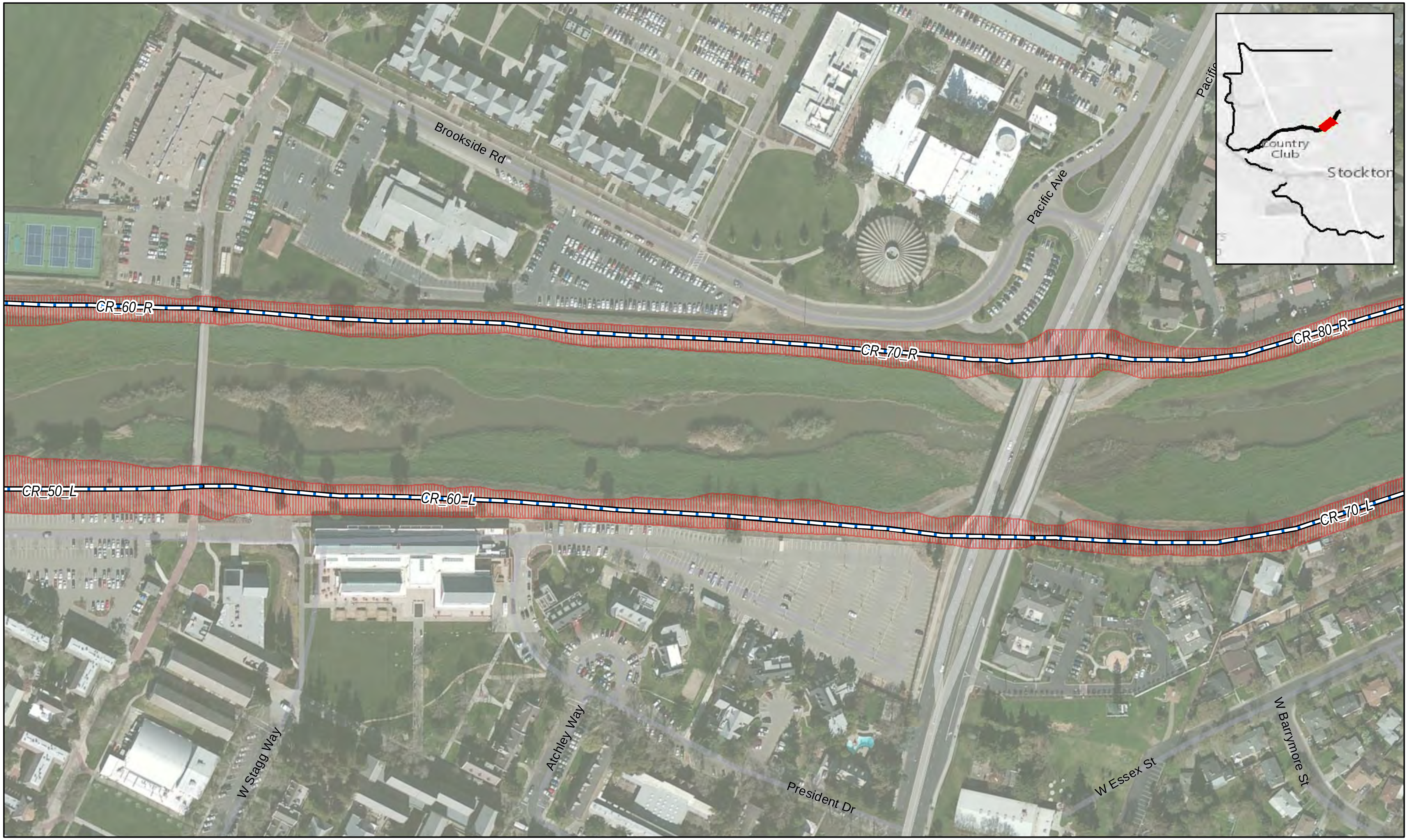

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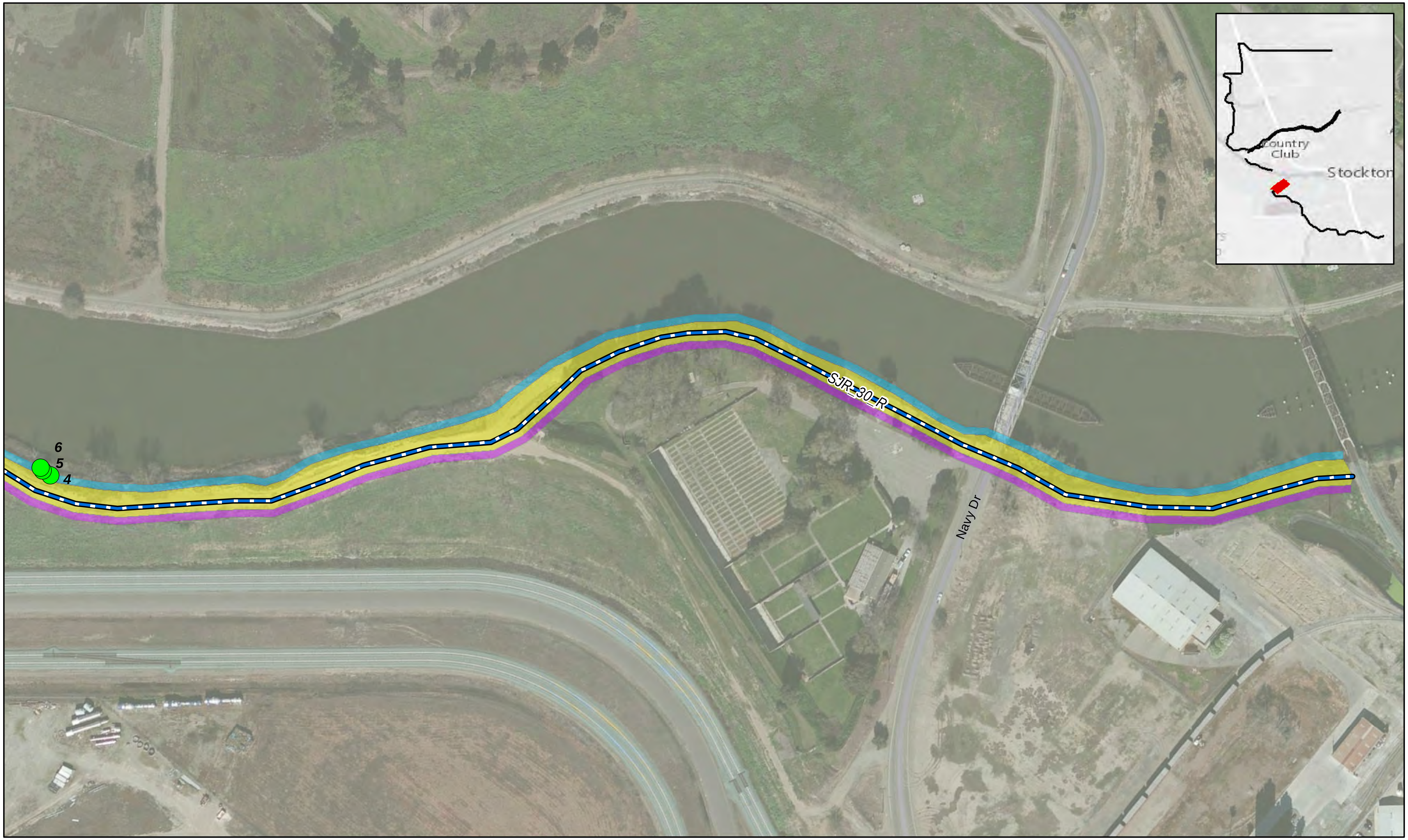

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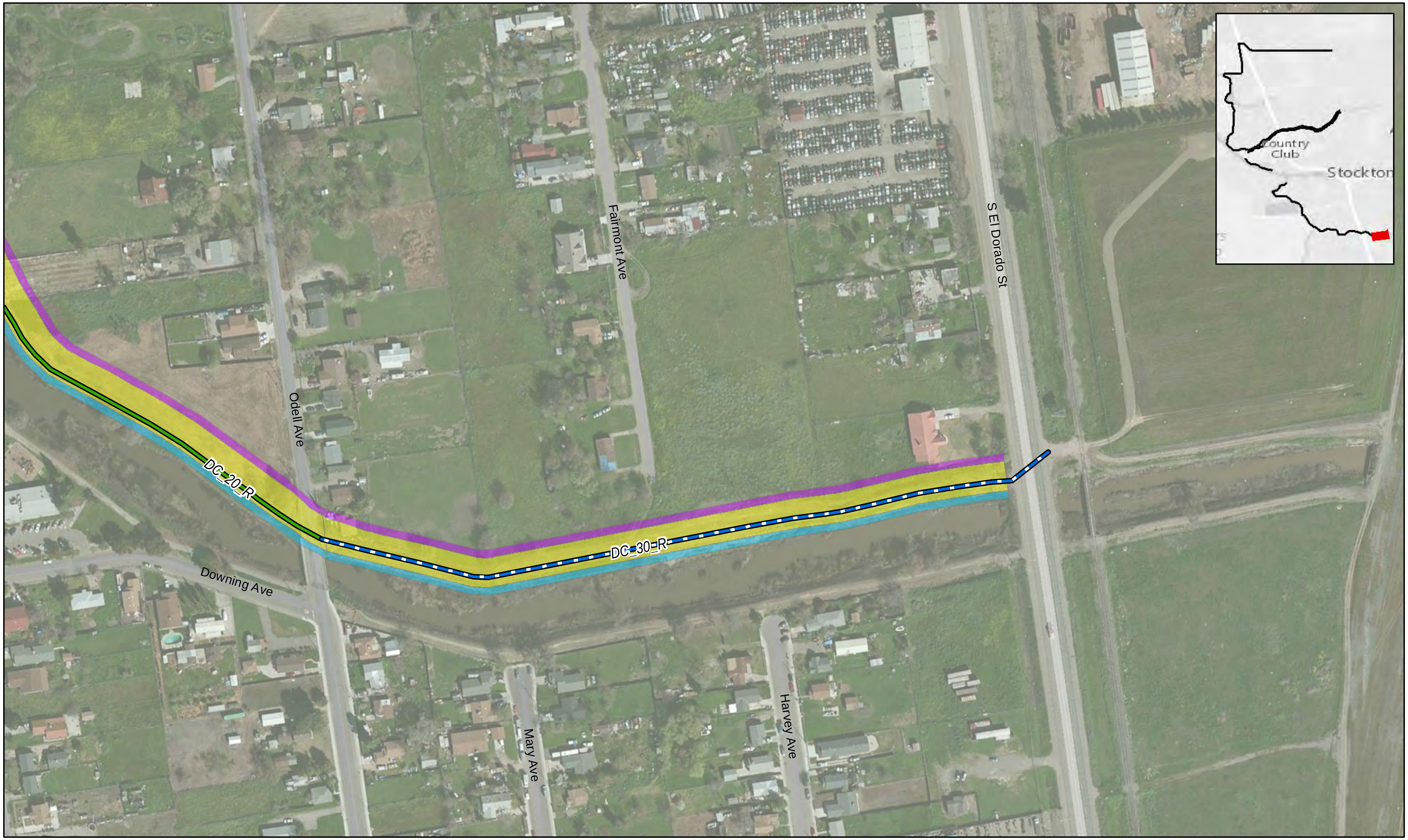

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D-2 Elderberry Location Mapbook

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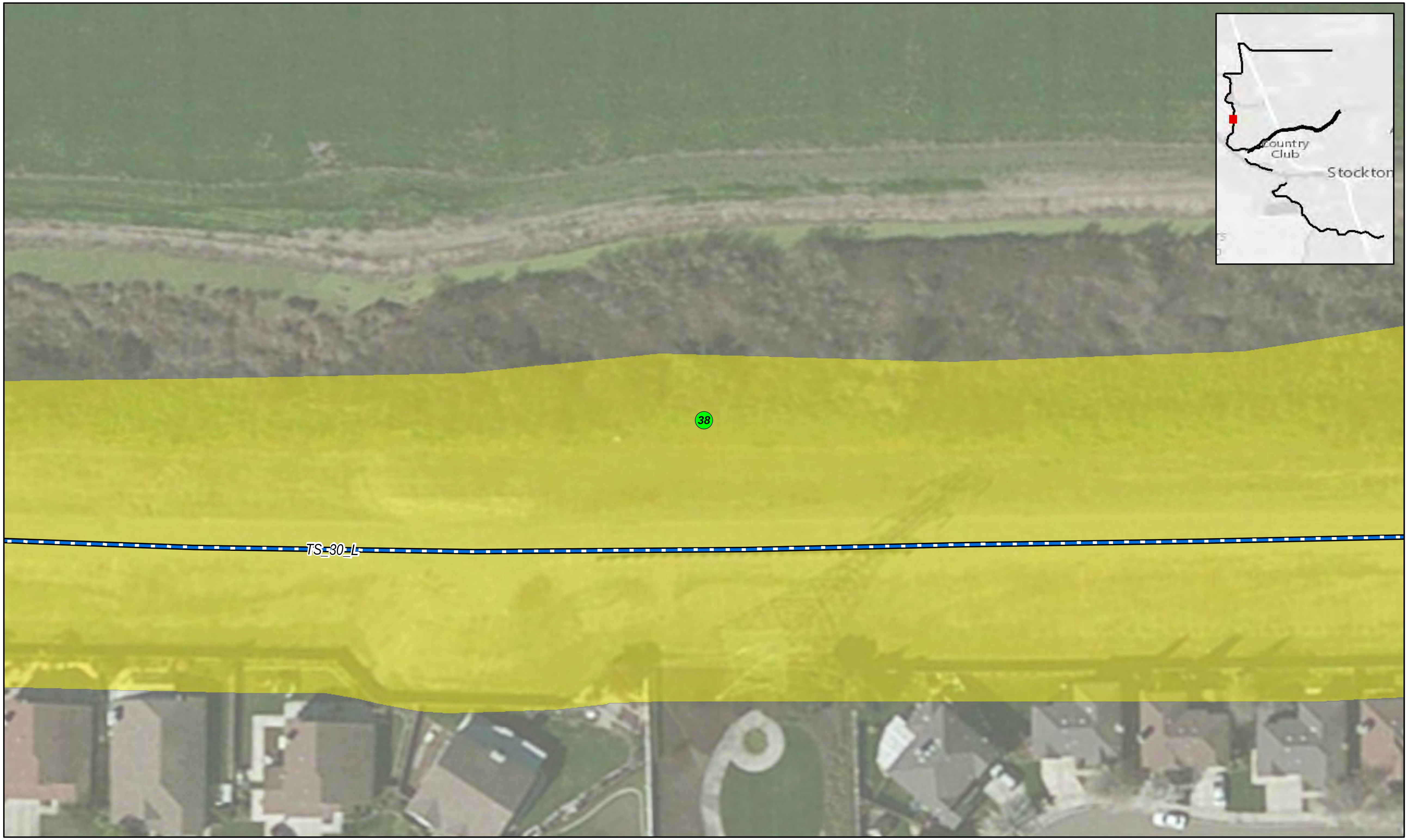

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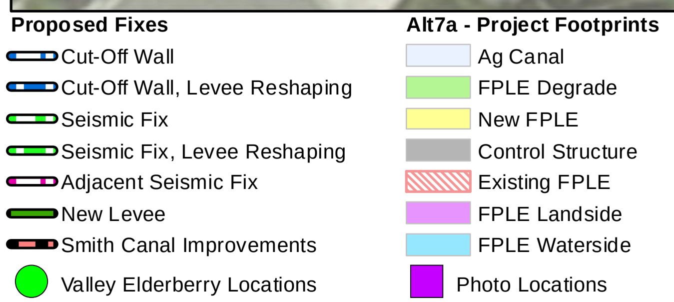

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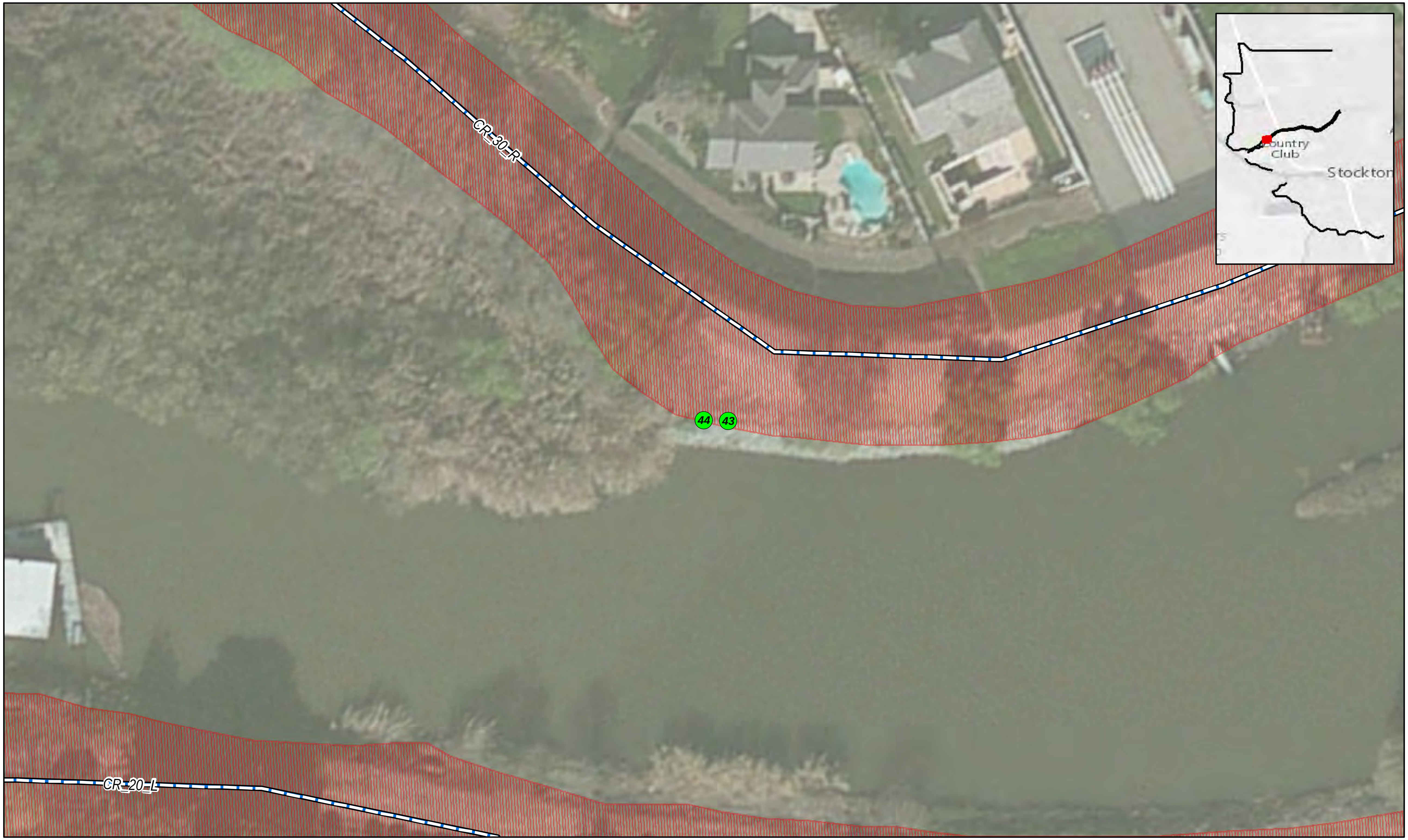

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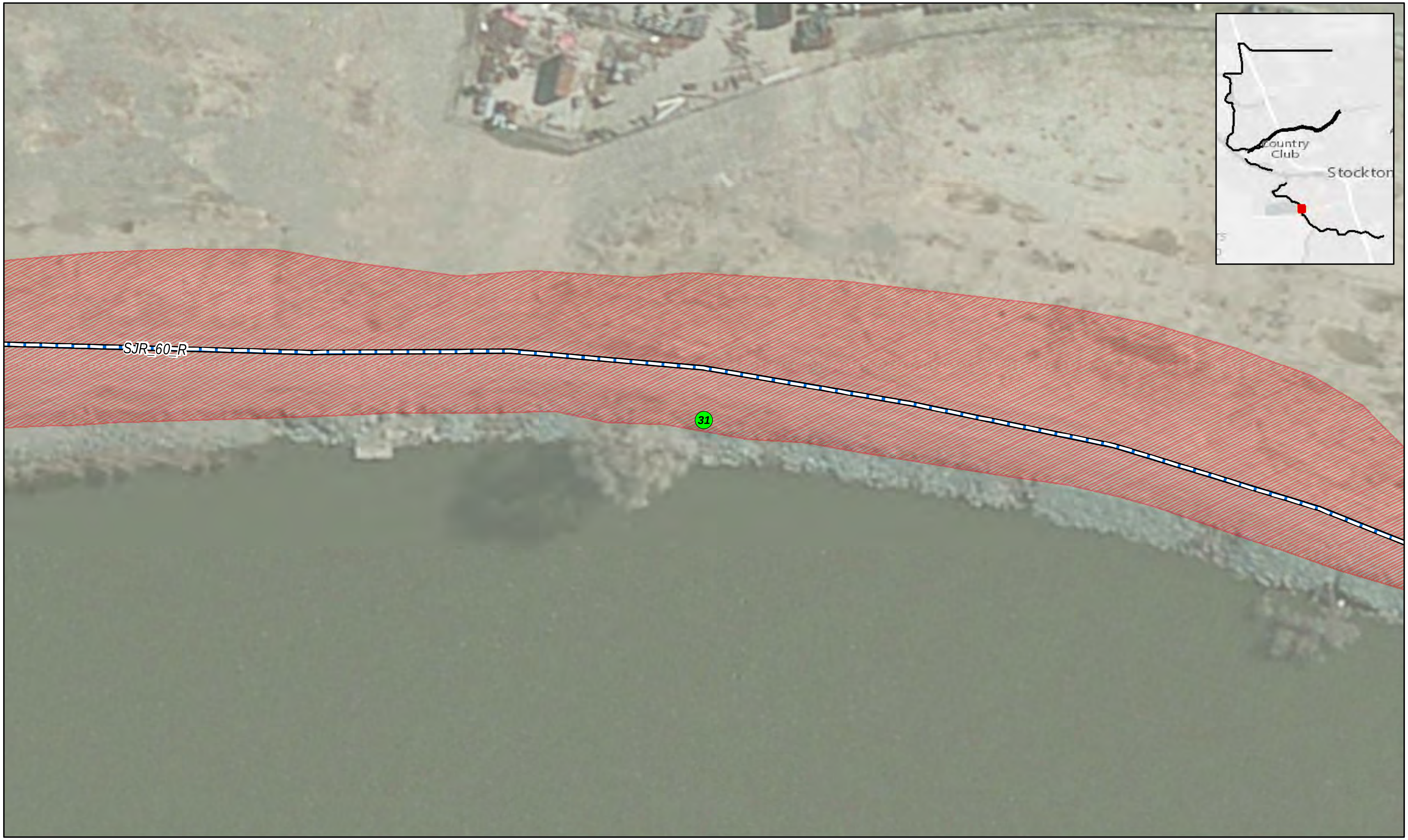

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APPENDIX C

Table C-1. LSJRFS: Reaches & Fixes for the Recommended Plan (Alternative 7a)

Table C-1. LSJR FS: Reaches & Fixes for the Proposed Action (Recommended Plan/ Alternative 7a

Environ Reach	Cost Reaches[1]	Project Levee?[2]	Waterway	NEPA/CEQA Reach	Proposed Measure(s)	Percent of Land Surface that Must be Cleared of Vegetation In Order to Construct Structural FRM Features: Landside Levee Slope	Landside Easement	Waterside[3] Levee Slope	Waterside[3] Easement
NORTH STOCKTON									
NS-E-1 (17,300 ft)	MC_30L (6,600 ft)	No	Mosher Slough	Thornton Road to railroad tracks	Cutoff wall	100% Upper half of levee. 0% of lower half of levee.	0%	100% Upper half of levee. 0% of lower half of levee.	0%
	MC_10L, MC_20L, 10,700 ft	No	Mosher Slough	Shima Tract to Thornton Road	Cutoff wall Levee height fix (sea level rise)	100%	100%	100% Upper half of levee. 0% of lower half of levee.	0%
NS-E-2 (6,700 ft)	ST_10R, ST_20R, (6,700 ft)	No	Shima Tract	Mosher Slough to Fivemile Slough	Cutoff wall Erosion protection (landside)[4]	100%	100%	100% upper half of levee. 0% of lower half of levee	0%
NS-E-3 (1,700 ft)	FS_10R (1,700 ft)	No	Fivemile Slough	Shima Tract to Fourteenmile Slough	Cutoff wall Erosion protection (landside)[4]	100%	100%	100% upper half of levee. 0% of lower half of levee	0%
NS-E-4 (10,400 ft)	FM_60_L (1,600 ft)	No	Fourteenmile Slough	Fivemile Slough to Proposed Closure Structure	Seismic Fix Slope Reshaping Levee height fix (sea level rise) Erosion protection (landside)[4]	100% upper half of levee. 100% of lower half of levee	100%	100% upper half of levee. 0% of lower half of levee	0%[1]
	FM_50_L, (300 ft)	No	Fourteenmile Slough	Approximately 1,500 feet west of Fivemile Slough	Closure Structure	100%	100%	100%	100%
	FM_40_L, (1,500 ft)	No	Fourteenmile Slough	Approximately 1,250 feet southeast setback out from proposed closure structure	Seismic Fix Levee height fix (sea level rise) Erosion protection (landside)[4]	100% upper half of levee. 100% of lower half of levee	100%	100% upper half of levee. 0% of lower half of levee	0%[1]
	FM_30_L (7,000 ft),	No	Fourteenmile Slough	From setback cut south to Tenmile Slough	Seismic Fix (adjacent levee) Erosion protection (landside)[4] Setback levee	100% upper half of levee. 100% of lower half of levee	100%	100% upper half of levee. 0% of lower half of levee	0%[1]
NS-E-5 (11,500 ft)	TS_30_L (5,900 ft)	No	Tenmile Slough	Fourteenmile Slough to March Lane	Cutoff wall Slope Reshaping Erosion protection (waterside)[4]	100%	100%	100% upper half of levee. 0% of lower half of levee	0%[1]
	TS_20_L (1,600 ft),	No	Tenmile Slough	March Lane to West March Lane/Buckley Cove Way	Seismic Fix Slope Reshaping Erosion protection (waterside)	100% upper half of levee. 100% of lower half of levee	100%	100% upper half of levee. 0% of lower half of levee	0%[1]
	TS_10_L (4,000 ft)	Yes	Tenmile Slough/Buckley Cove	West March Lane/Buckley Cove Way to Calaveras River	Seismic Fix Slope Reshaping	100% upper half of levee.	100%	100% upper half of levee.	0%[1]

Environ Reach	Cost Reaches[1]	Project Levee?[2]	Waterway	NEPA/CEQA Reach	Proposed Measure(s)	Percent of Land Surface that Must be Cleared of Vegetation In Order to Construct Structural FRM Features			
						Landside		Waterside[3]	
						Levee Slope	Easement	Levee Slope	Easement
			Marina/San Joaquin River			0% of lower half of levee		0% of lower half of levee	
NS-E-6 (23,000 ft)	CR_10_R, CR_20_R, CR_30_R CR_40_R, CR_50_R, CR_60_R, CR_70_R, CR_80_R (23,000 ft)	Yes (except CR_10_R)	Calaveras River – Right/North Bank	San Joaquin River to North El Dorado Street	Cutoff wall	100% Upper half of levee. 0% of lower half of levee.	0%	100% Upper half of levee. 0% of lower half of levee.	0%
CENTRAL STOCKTON									
CS-E-1 (8,300 ft)	CR_10_L, CR_20_L, CR_30_L (8,300 ft)	Yes	Calaveras River – Left/South Bank	San Joaquin River to approximately I-5	Cutoff wall	100% Upper half of levee. 0% of lower half of levee.	0%	100% Upper half of levee. 0% of lower half of levee.	0%
CS-E-1 (6,900 ft)	CR_40_L (6,900 ft)	Yes	Calaveras River – Left/South Bank	Approximately I-5 to approximately North Pershing Avenue	Cutoff wall Slope Reshaping	100%	100%	100% Upper half of levee 0% of lower half of levee	0%
CS-E-1 (3,300 ft)	CR_50_L, CR_60_L (3,300 ft)	Yes	Calaveras River – Left/South Bank	Approximately North Pershing Avenue to approximately North Pacific Street	Cutoff wall	100% Upper half of levee. 0% of lower half of levee.	0%	100% Upper half of levee. 0% of lower half of levee.	0%
CS-E-2 “a”	CR_70_L	Yes	Calaveras River – Left/South Bank	Approximately North Pacific Avenue to El Dorado Street	Cutoff wall	100% Upper half of levee. 0% of lower half of levee.	0%	100% Upper half of levee. 0% of lower half of levee.	0%
CS-E-4 (800 ft)	SC_30 (800 ft)	No	Smith Canal	At the mouth of the canal between Brown’s Island and Dad’s Point	Closure Structure	100%	100%	100%	100%
CS-E-5 (5,000 ft)	SJR_10_R, (8,600 ft)	No	San Joaquin River	From approximately 2,100 feet upstream of the Calaveras River to the proposed Smith Canal Closure Structure	Cutoff wall Levee height fix (sea level rise)	100%	100%	100% Upper half of levee 0% lower half of levee	0%
	SJR_20_R (600 ft)	No	Smith Canal	Dad’s Point from the Closure Structure to approximately 375 feet down Monte Diablo Avenue	Floodwall	100%	100%	100%	100%
CS-E-7 (16,100 ft)	SJR_30_R (3,500 ft)	No	San Joaquin River	Railroad bridge just upstream of the Port of Stockton to Burns Cutoff	Cutoff wall Slope Reshaping	100%	100%	100% upper half of levee 0% of lower half of levee	0%
	SJR_40_R,	Yes	San Joaquin River	Burns Cutoff to French Camp Slough	Cutoff wall	100% Upper half of levee.	0%	100% Upper half of levee.	0%

Environ Reach	Cost Reaches[1]	Project Levee?[2]	Waterway	NEPA/CEQA Reach	Proposed Measure(s)	Percent of Land Surface that Must be Cleared of Vegetation In Order to Construct Structural FRM Features: Landside – Levee Slope	Landside – Easement	Waterside[3] – Levee Slope	Waterside[3] – Easement
	SJR_50_R, SJR_60_R, SJR_70_R (12,600 ft)					0% of lower half of levee.		0% of lower half of levee.	
CS-E-8 (9,800 ft)	FCS_10_R (9,000 ft)	Yes		Part of CS-E-9 “a” and “b” NEPA Reaches	Cutoff wall	100% Upper half of levee. 0% of lower half of levee	0%	100% Upper half of levee. 0% of lower half of levee	0%
CS-E-9 “a” (450 ft)	DC_10_R	Yeso	Duck Creek (“a” only)	French Camp Slough to 500 ft past I-5 crossing	Cutoff wall	100% Upper half of levee 0% of lower half of levee-	0%	100% Upper half of levee 0% of lower half of levee	0%
CS-E-9 “b” (4,000 ft)	DC_20_R	No	Duck Creek	500 feet past I-5 crossing to approximately Odell Avenue	New Levee	--	100%	--	100%
	DC_30_R	No	Duck Creek	Approximately Odell Avenue to McKinley Avenue	Fix in-place Cutoff wall Levee Reshaping Levee height fix	100% Upper half of levee. 0% of lower half of levee	0%	100% Upper half of levee. 0% of lower half of levee	0%

[1] The Cost Reaches are shown on Figures C-1 and C-6.

[2] “Project levee” refers to those existing levees that are currently part of the Federal flood risk management system.

[3] “Waterside” refers to the ecological waterside (i.e., towards any proximate canal, slough, river or stream channel). Toe drains and agricultural ditches are not considered.

[4] The new erosion protection included in the Recommended Plan will be placed either on the waterside of the levee or on the landside of the levee. All of this new erosion protection is placed above the waterline. The purpose of the North Stockton erosion protection is protect the project levee from wind and wave run-up erosion which could occur if Delta levees to the west of the project levee were to fail allowing flooding of land immediately west of the project levee. The purpose of the Central Stockton erosion protection on Duck Creek is to protect the backside (landside) of the levee from erosion that could occur if floodwaters moving from the south to the northeast were to wrap the end of the project levee and back up against it.

Note: New levees = 20 feet O&M easement (each side); existing non-Federal levees newly brought into the Federal system = 10 to 15 feet O&M easements.

Appendix E

Vegetation Photos by Waterway

E-1 Mosher Slough Vegetation Photos

E-2 Delta Front Vegetation Photos

E-3 Calaveras River Vegetation Photos

E-4 San Joaquin River Vegetation Photos

E-5 French Camp Slough Vegetation Photos

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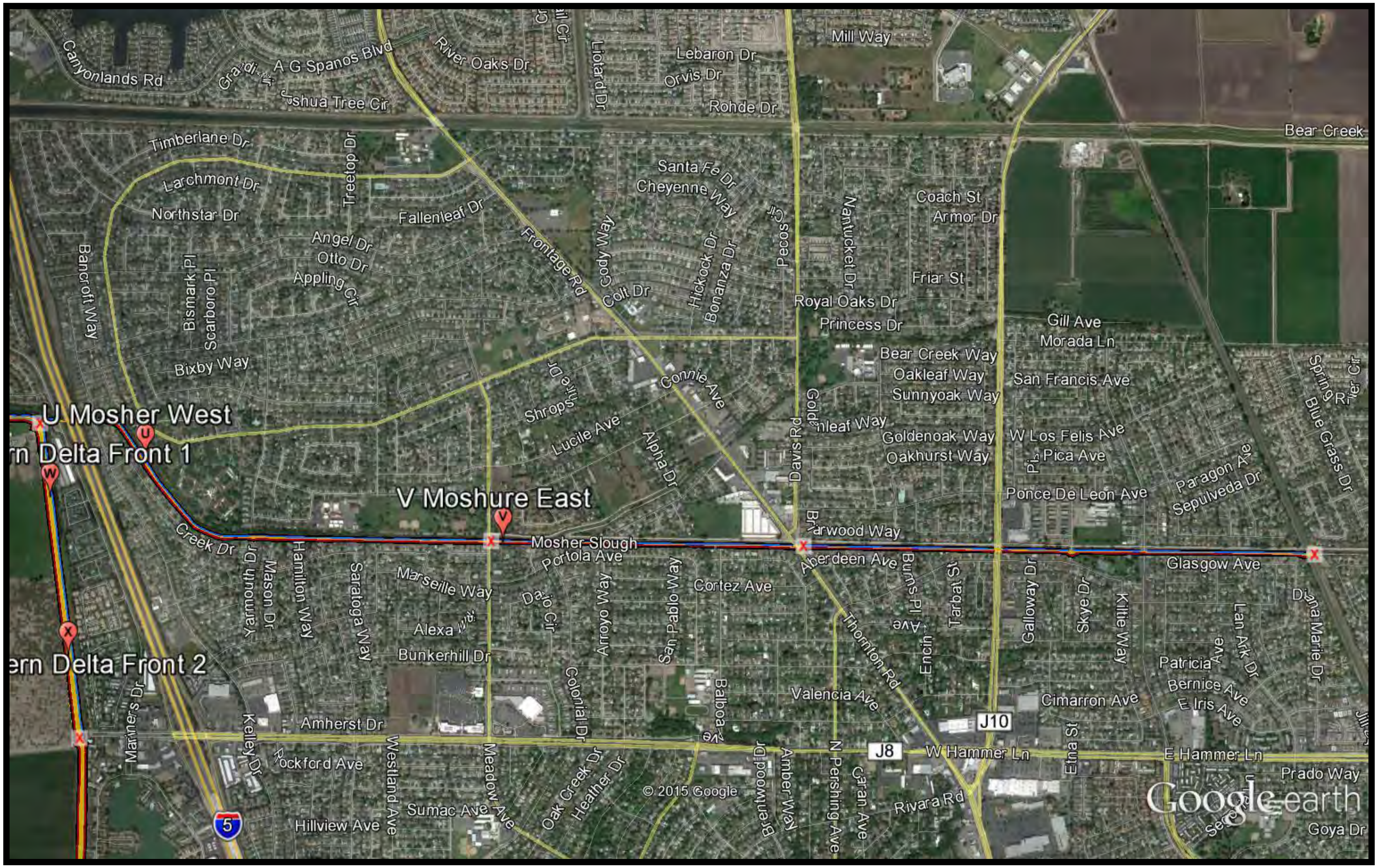
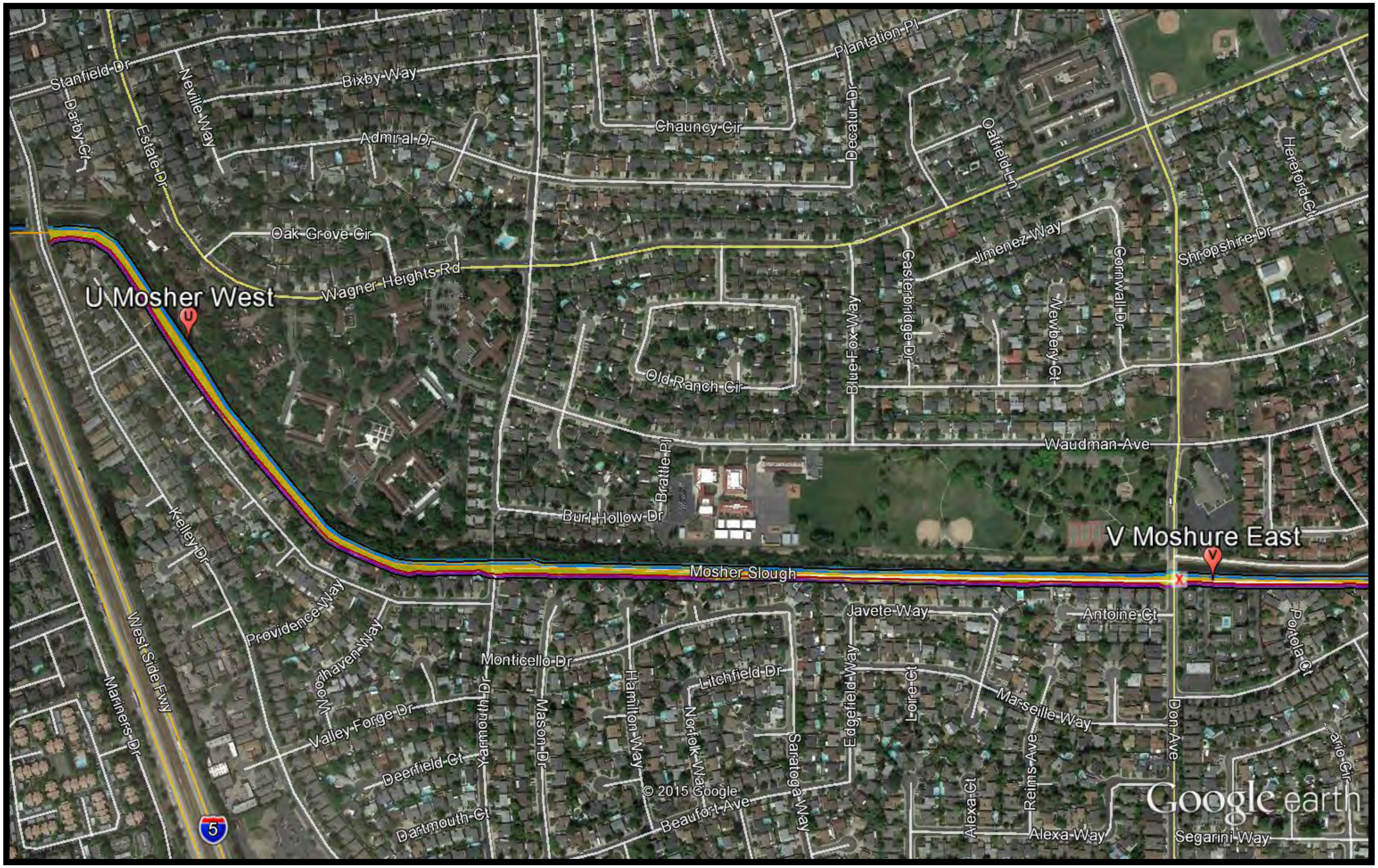
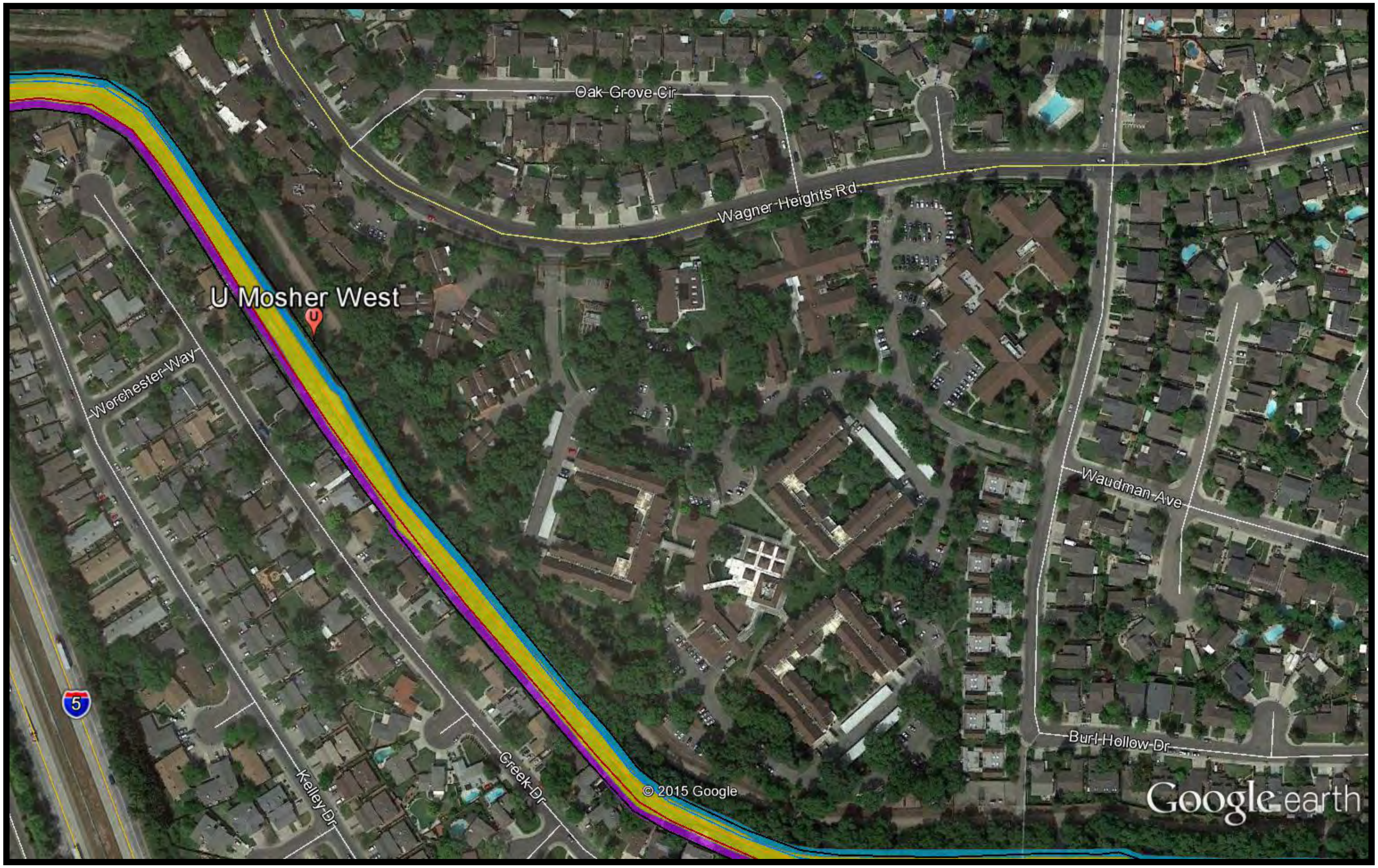
Mosher Slough – Showing Photo Points



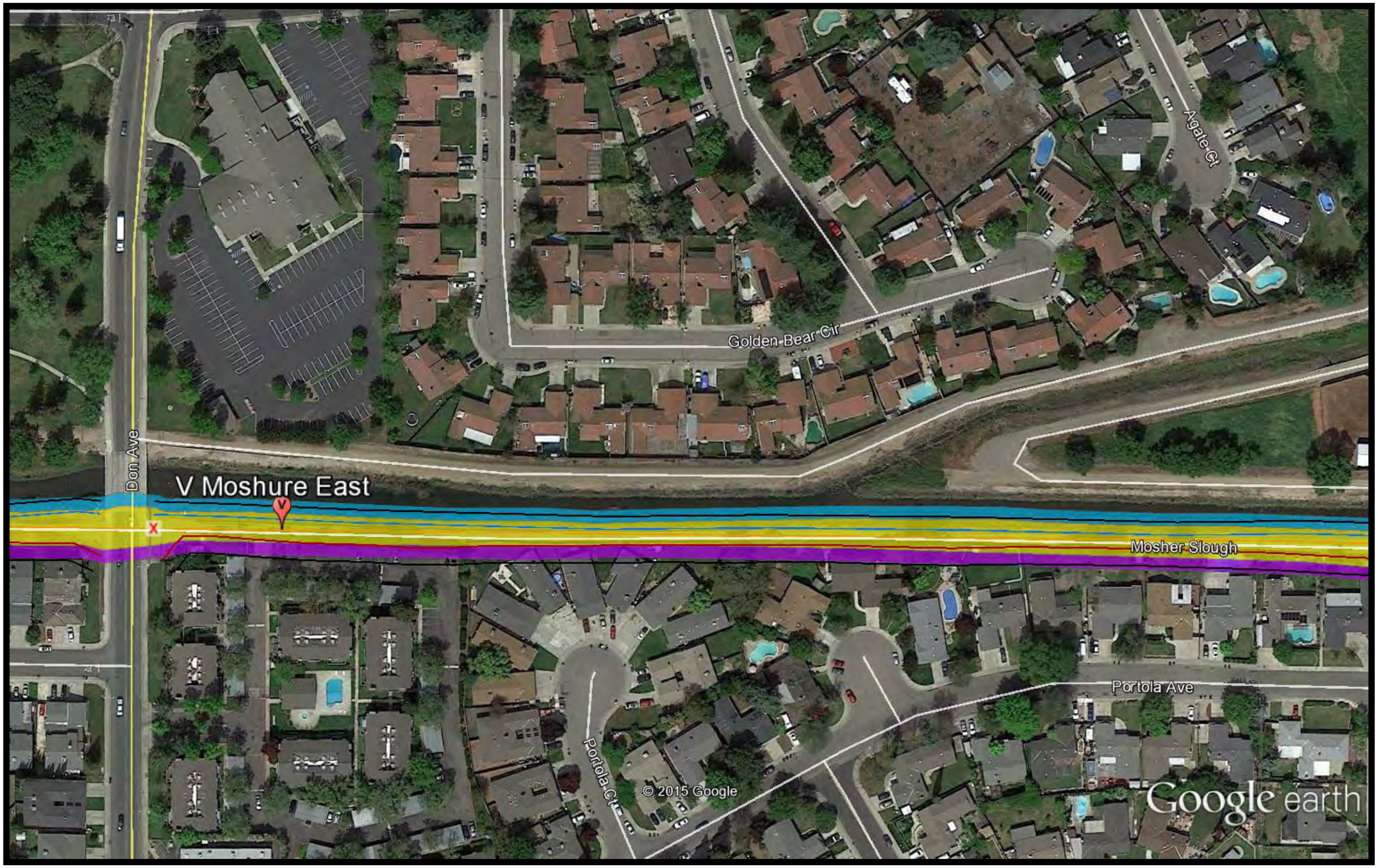
Mosher Slough – Showing two photo points.



Mosher Slough – Showing the west-most photo point ("U")



Mosher Slough – Showing Photo point "V" on the eastern portion of Mosher Slough (6/23/15)

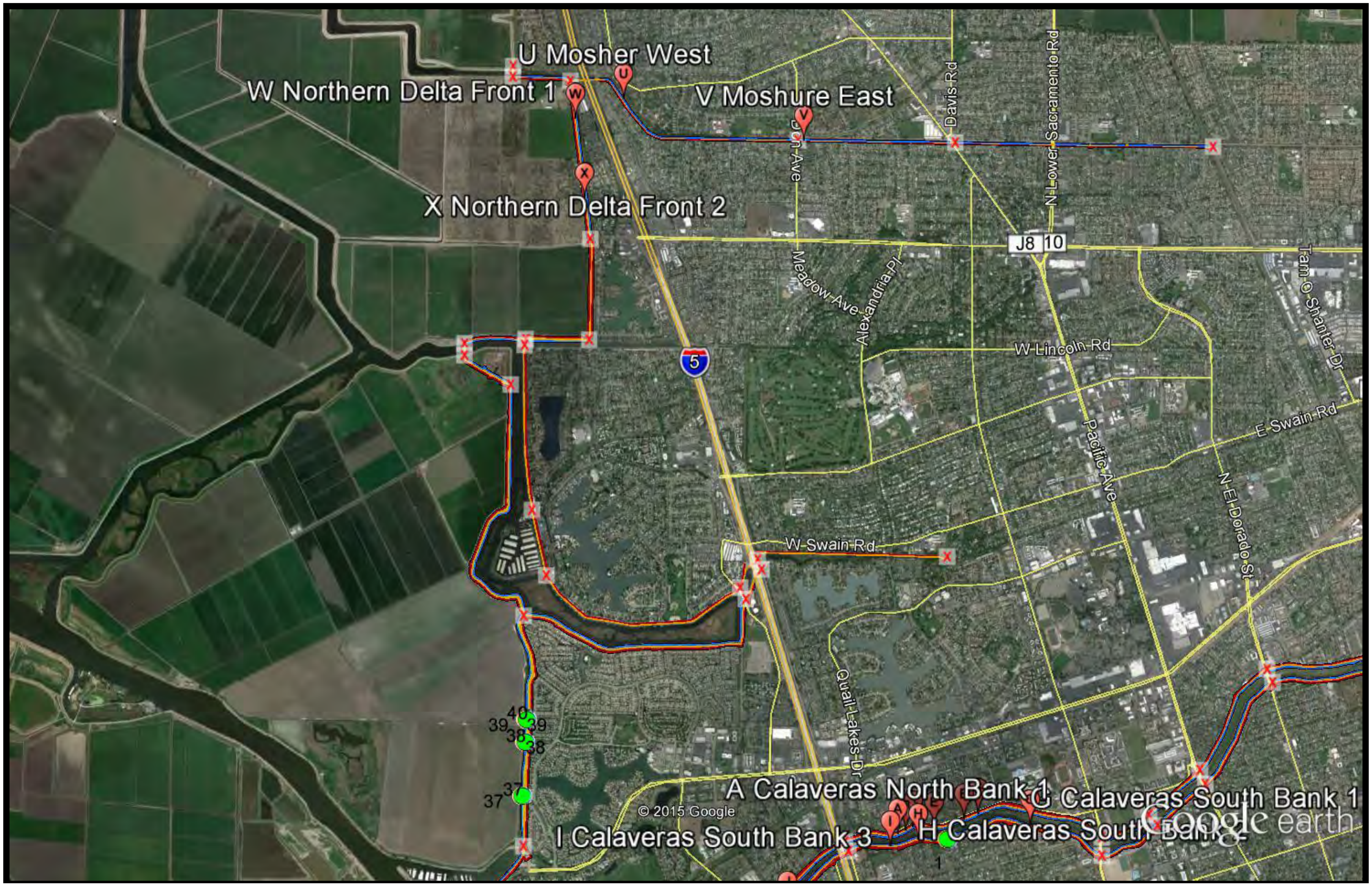


Mosher Slough – Photo "U" which Characterizes the western portion of Mosher Slough (6/23/15)

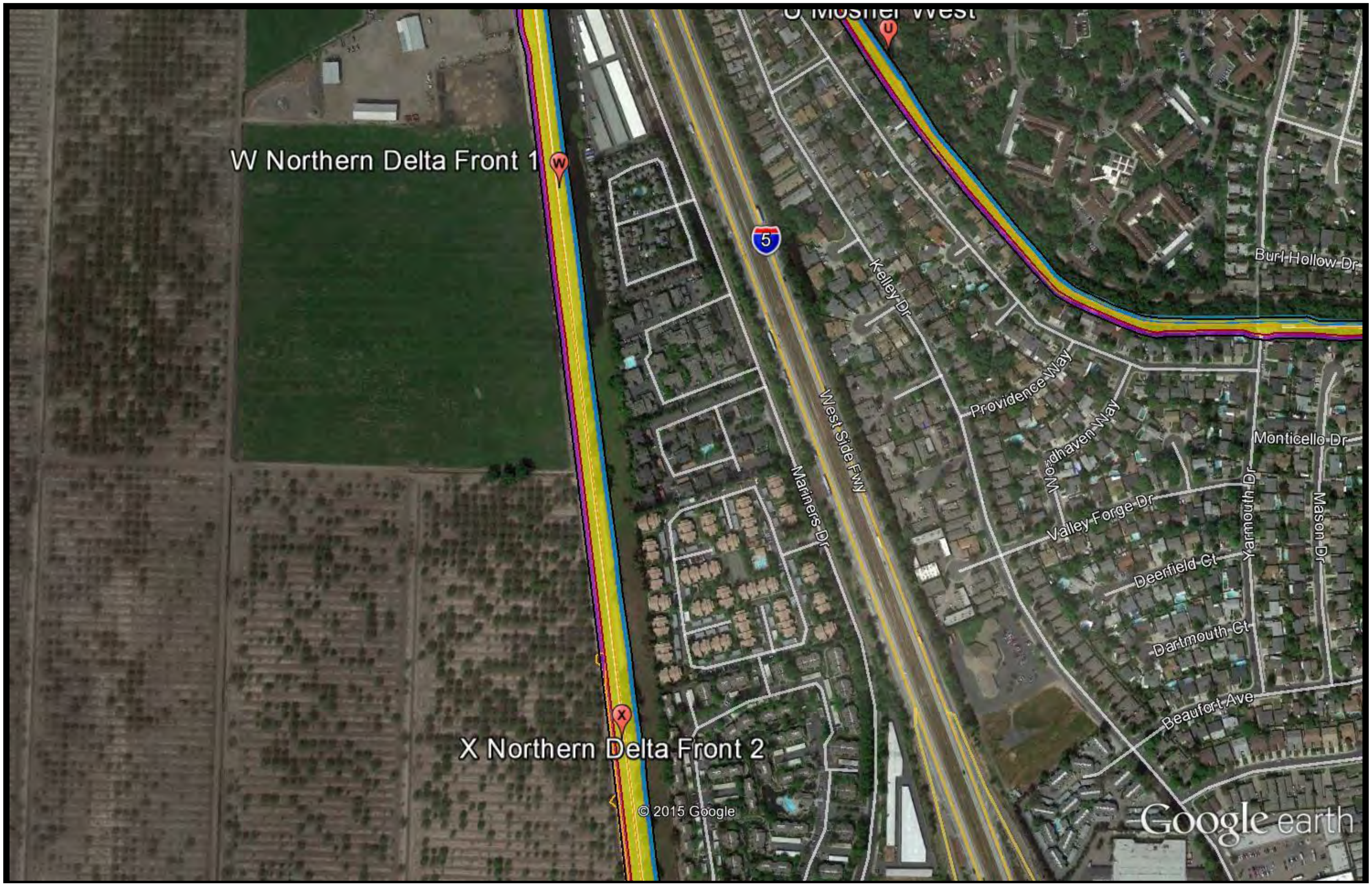
Mosher Slough – Photo "V" which characterizes the eastern portion of Mosher Slough (6/23/15)

*

Delta Front – Photo locations



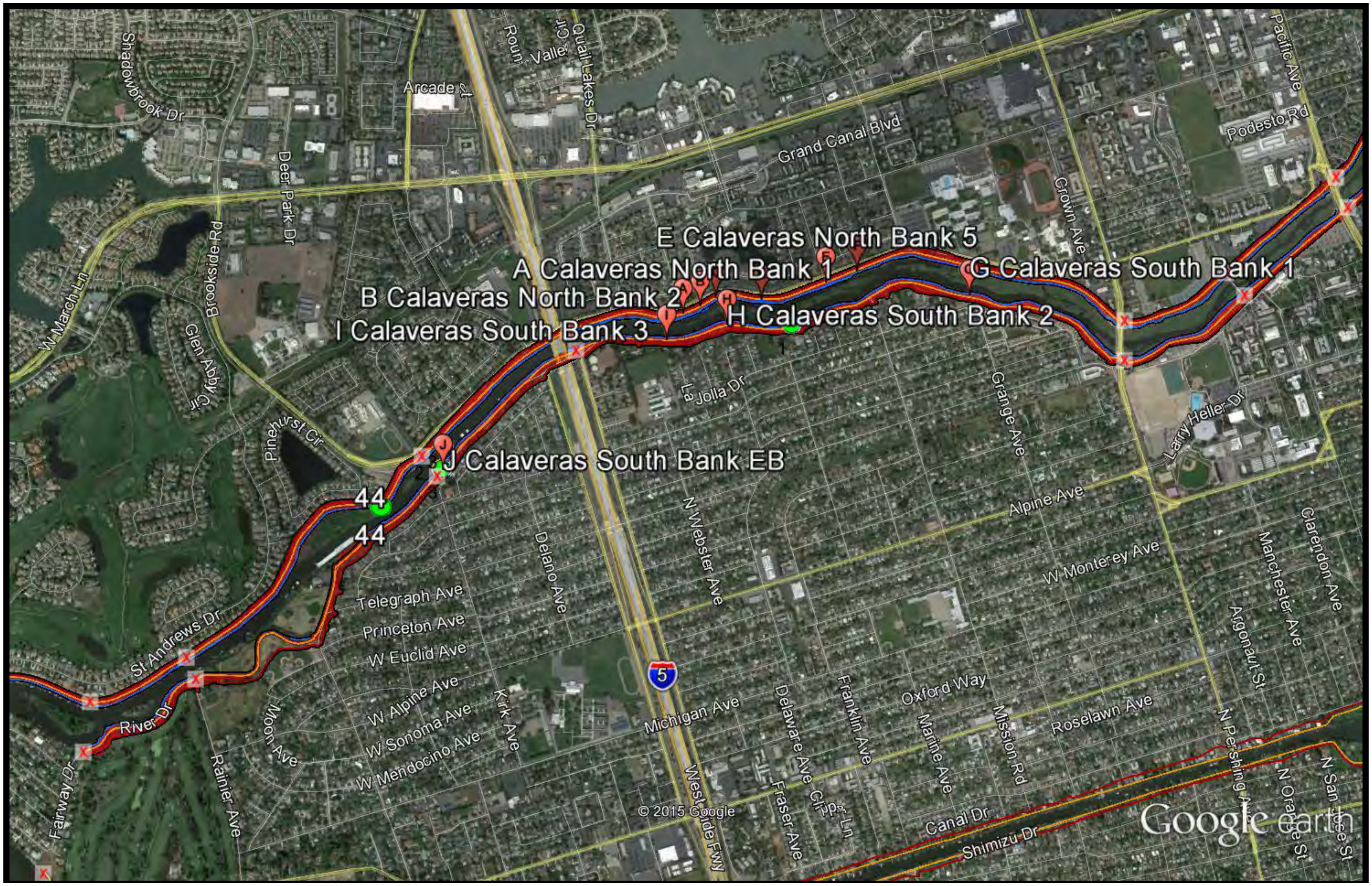
Shima Tract – Photo Locations



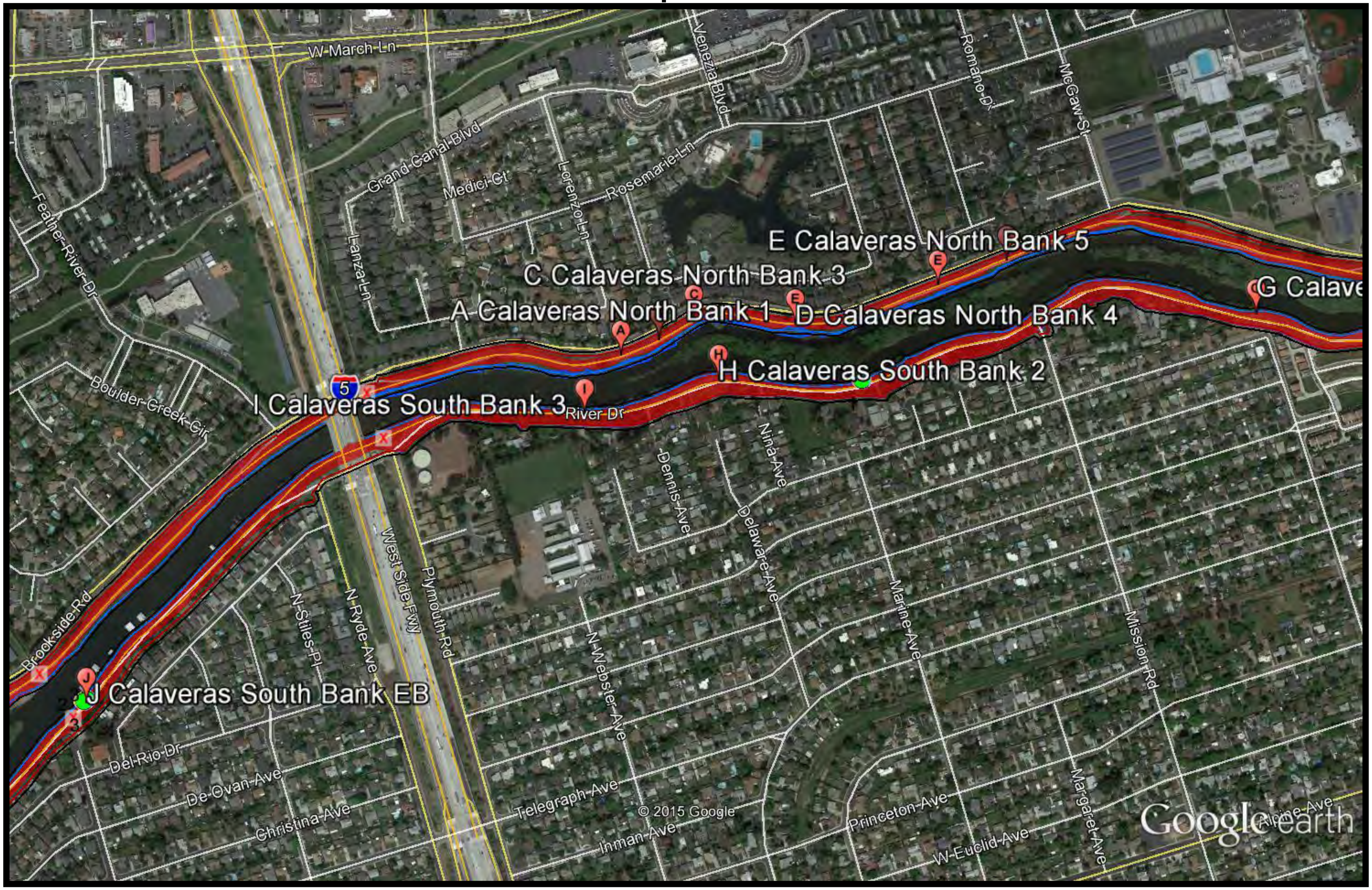
Shima Tract – Photo point "W" - North end of Shima Tract near Mosher Slough

Shima Tract – Photo Point "X"

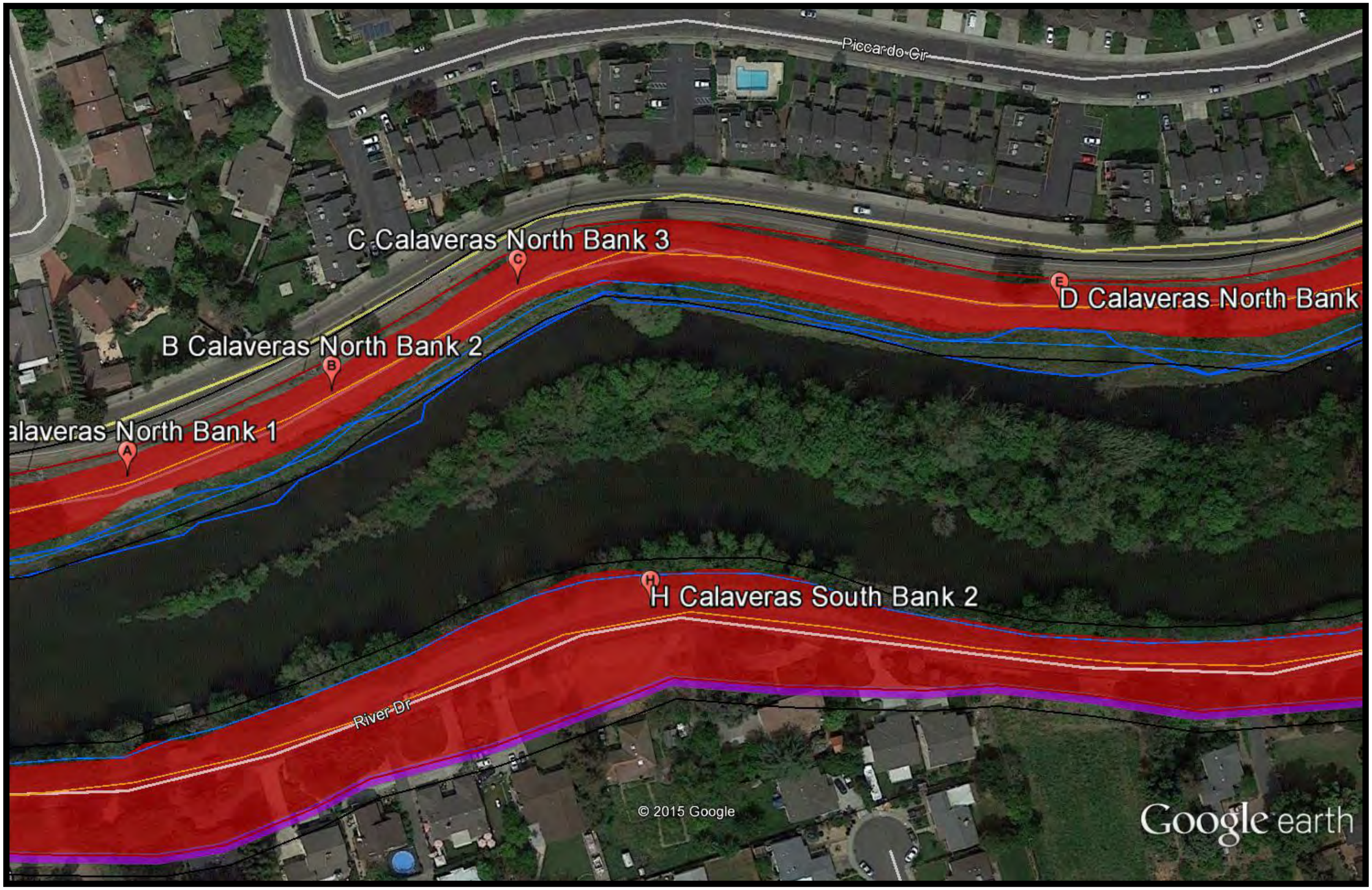
Calaveras River North and South Banks – Photo Points



Calaveras River North and South Bank – Photo points



Calaveras River North Bank – Photo Points



Calaveras River North Bank – Photo Point "A"

Calaveras River North Bank – Photo point "B"

Calaveras River North Bank – Photo Point "C"

Calaveras River North Bank – Photo Point "D"

Calaveras River North Bank – Photo Point "E"

Calaveras River North Bank – Photo Point "F"

Calaveras River South Bank – Photo Point “G”

Calaveras River South Bank – Photo Point “H”

Calaveras River South Bank – Photo Point "I"