Meeting of the Central Valley Flood Protection Board
May 20, 2016

Staff Report

Sutter Butte Flood Control Agency, Feather River West Levee Project
Amendment of Permit 18793-1 for Cutoff Wall Gap Closures, Project Area C, Sutter County

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1.0 – ITEM

Consider Central Valley Flood Protection Board (Board) approval of Resolution 2016-11 (Attachment A) to approve amending Permit18793-1 (Attachment B) to include cutoff wall gap (gap) closure work required to complete the Project Area C segment of the Feather River West Levee Project (FRWLP), which includes additional requested variances to California Code of Regulations, Title 23, Division 1, Article 8 (Title 23 Standards).

2.0 – APPLICANT

Sutter Butte Flood Control Agency (SBFCA)

SBFCA is a Joint Powers Agency formed in 2007 by Butte and Sutter Counties, the cities of Biggs, Gridley, Live Oak and Yuba City, and Levee Districts 1 and 9 of Sutter County (LD 1 and LD 9). SBFCA has the authority to finance and construct regional levee improvements, and is governed by a 13-member board comprised of elected officials from the cities, counties, and levee districts.

3.0 – PROJECT LOCATION

The FRWLP extends from Thermalito Afterbay in Butte County downstream approximately 41 miles to a point approximately 3.5 miles north of the Feather River's confluence with the Sutter Bypass in Sutter County. Project Area C (Attachment C), covered under previously issued Permit18793-1, extends north from Shanghai Bend (Reach 13) in Sutter County to approximately one quarter-mile north of Campbell Road in the City of Live Oak (Reach 24). The proposed amendments to the issued permit include the work proposed at several gap locations within Project Area C, Reaches 16, 17 and 18. The proposed extents of construction for the gap closures are as follows:

- 5th Street Bridge Gap Closure in Reach 16 from Station 1003+50 to Station 1010+19 (669 linear-feet)

- Union Pacific Railroad (UPRR) and Yuba City Raw Water (YCRW) Gap Closures: Reach 16 from Station 971+50 to Station 973+00 (150 linear-feet); Reach 17 from Station 1094+87 to Station 1100+00 (513 linear-feet); and in Reaches 17 and 18 from Station 1127+00 to Station 1140+50 (1,350 linear-feet)
- UPRR Closure Structure in Reach 17 from Station 1129+50 to 1130+50 (100 linear-feet)

4.0 – PROJECT DESCRIPTION

SBFCA is proposing to construct the following gap closures (Attachment D) within the project extents described in Section 3.0:

- 5th Street Bridge Gap Closure includes construction of a cutoff wall from Station 1005+74 to Station 1008+20 to an elevation of 40.0 feet (NAVD 88).
- UPRR and YCRW Gap Closure, which includes; the installation of approximately eight (8) relief wells; three (3) monitoring wells with a telemetry system; construction of approximately 760 feet of concrete lined ditch; construction of a stability berm between Station 1096+00 and 1100+00; utility modifications near Station 972+29, 1096+62 to 1096+81, and 1127+48; and approximately 2,500 feet of storm drain is also proposed as part of the UPRR and YCRW Gap Project (located outside of Board jurisdiction and not part of the permit amendment).
- UPRR Closure Structure (near UPRR crossing at approximately Station 1130+10), which includes the construction of permanent and temporary features for the installation of a removable closure structure across the railroad tracks.

Attachment E includes the July and September 2013 Staff Reports for completed Project Area C construction.

5.0 – AUTHORITY OF THE BOARD

California Water Code § 8534, 8590 – 8610.5, and 8700 - 8710

California Code of Regulations, Title 23, Division 1 (Title 23):

- § 6, Need for a Permit
- § 11, Variances
- § 13, Evidentiary Hearings
- § 108, Existing Encroachments
- § 112, Streams Regulated and Nonpermissible Work Periods

- § 116, Borrow and Excavation Activities – Land and Channel
- § 120, Levees
- § 121, Erosion Control
- § 123, Pipelines, Conduits and Utility Lines
- § 124, Abandonment of Pipelines
- § 128, Bridges
- § 130, Patrol Roads and Access Ramps

Rivers and Harbors Act of 1899, Title 33 United States Code, § 408, hereafter referred to as Section 408

Memorandum of Understanding Respecting the Sacramento River Flood Control Project, November 30, 1953 (between USACE South Pacific Division and the State of California, acting by and through The Reclamation Board), and November 29, 1958 Supplement

6.0 – AGENCY COMMENTS AND ENDORSEMENTS

The comments and endorsements associated with the projects are as follows and shall be incorporated into the draft amended permit by reference as an Exhibit:

- **U.S. Army Corps of Engineers (USACE) Sacramento District Letter of Permission (LOP)** has not yet been received for this application. Staff anticipates receipt of the LOP in May or early June indicating that the Director of Civil Works for the USACE has approved the request to alter the Federal flood risk reduction project, subject to conditions. When received, the staff will review the LOP for conformity with the draft amended permit conditions and will incorporate it into the permit as Exhibit A. This LOP shall supersede those previously issued on July 22, 2013 (Reach 13 only) and September 19, 2013 (all other Project Area C reaches).
- **USACE Headquarters Record of Decision (ROD)** dated September 13, 2013 (incorporated into the draft amended permit as Exhibit B) covers all of Project Area C including the proposed gap closures, with the exception of Reach 13. A separate ROD dated July 19, 2013 (draft amended permit Exhibit C) approved Reach 13.
- **Maintenance Area 16** previously endorsed the project on May 16, 2013 (incorporated into the amended permit as Exhibit D) as part of the original Project Area C permit hearing held on May 24, 2013. No proposed gap closure work will be done within this maintenance area.

- **Levee Districts (LD) 1 and 9** have re-endorsed the project with the proposed gap closure work considered (incorporated into the amended permit as Exhibits E and F, respectively). Gap closure work within the levee districts are as follows:
  - 5th Street Bridge Gap Closure – LD 1
  - UPRR and Yuba City Raw Water Gap Closure – LD 1 and LD 9
  - UPRR Closure Structure – LD 1
- **Department of Water Resources (DWR)** has partnered with SBFCA to achieve the goal of 200-year protection for the urban area protected by the FRWL system for approximately $223.1 million in State funding. Construction is anticipated to be completed in 2016.

7.0 – PROJECT ANALYSIS

7.1– Project Background

The Sutter-Butte Basin includes the communities of Yuba City, Live Oak, Gridley, and Biggs and has experienced numerous flood events since the 1800's. In order to reduce flood risks in the urban areas and within the basin, SBFCA is implementing the FRWLP (Projects 1 and 2), which includes rehabilitating over 41 miles of the FRWL between Thermalito Afterbay Dam to the Sutter Bypass.

Due to the flood risk in the area, SBFCA is pursuing the FRWL Project in parallel and coordinated with a separate effort by the USACE, Board, DWR and SBFCA, to determine the Federal interest in the Sutter Basin Project. The Sutter Basin Project was evaluated under a Feasibility Study, the Chief's Report was completed, and the project was authorized by Congress in 2014. The FRWL Construction Project C is being advanced by SBFCA ahead of the USACE project to more quickly address flood risks.

Each reach has been evaluated for susceptibility to through seepage, underseepage, slope stability, encroachments, and geometry deficiencies. The primary deficiencies determined by the analyses are levee through seepage and underseepage. Accordingly, Project Area C (Permit 18793-1) includes construction of approximately 12 miles of soil-bentonite cutoff wall installation, 400 lineal feet of seepage berm, and removal, relocation, and modification of a large number of levee encroachments.

During the design of Project Area C, special design areas were identified. SBFCA decided to address these areas with supplemental plan sets due to the increased complexity and coordination required with different parties. This allowed construction on Project Area C to commence while the details of the special design areas were

developed. SBFCA has finished preparing construction documents for these special gap design areas and is now seeking an updated LOP (to supersede previously issued LOP's) from USACE and an amended Board Permit 18793-1 (to supersede the previously issued permit from 2013).

Project 1 (Project Areas C, B, and D) extends from the Thermalito Afterbay Dam to South Star Bend and was approved under separate Board permits (18793-1, 18793-2, and 18793-3, respectively). Construction began in 2013 on the Project 1 and is currently anticipated to be completed in 2016.

Project 2 (Laurel Avenue Repair Project) is the predominantly rural area in the southern and southwestern portion of the Sutter-Butte basin that is protected by levees along the FRWL south of Star Bend, by levees on the west along the Sutter Bypass, and by levees on the northwest along Wadsworth Canal.

The proposed project is designed to close the Project Area C gaps in order to accomplish the objective to provide 200-year protection to the surrounding urban areas. The proposed gap closures would conclude all remaining Project Area C construction.

7.2– Project Benefits

The proposed project is expected to provide the following benefits:

- Address major geotechnical concerns such as through- and under-seepage, slope stability, and the condition and impact of existing encroachments
- Reduce the risk of flooding for existing urban areas, agricultural commodities, infrastructure, and other properties
- Increase the level of flood protection to a targeted 200-year level for Yuba City and Live Oak consistent with the adopted Central Valley Flood Protection Plan (CVFPP) and Senate Bill 5 (Statutes of 2008) to provide 200-year flood protection for urban and urbanizing areas

7.3– Hydraulic Summary

The overall FRWL hydraulics (from Thermalito Afterbay Dam to the Sutter Bypass) was approved as part of Project 1 for the FRWL, Project Area C Permit 18793-1 in May 2013. The proposed gap closures in Project Area C do not alter the 2013 approved hydraulics. Therefore, Board staff has determined that no further hydraulic analysis is needed.

7.4– Geotechnical Summary

The proposed gap closures have been evaluated for susceptibility to through- and under-seepage, slope stability, and geometry deficiencies (such as levee side slopes). At the location of the bridge and pipe crossings the gap closures were analyzed for the referenced geotechnical deficiencies and remediated as follows:

- 5th Street Bridge Gap Closure – The predominant deficiencies determined by the geotechnical analyses are levee through- and under-seepage. Project Area C includes construction of approximately 246 linear-feet of a cutoff wall across the 5th Street Bridge. The recommended depth for the cutoff wall is approximately 48 feet at this location.
- UPRR and Yuba City Raw Water Gap Closure – The predominant deficiencies determined by the geotechnical analyses are levee through- and under-seepage. The project will include construction of eight (8) relief wells and a stability berm. The proposed relief wells range in depth from approximately 30 feet to 40 feet.

Board staff has reviewed the geotechnical information provided by SBFCA for the proposed gap closures and has determined that the proposed project is expected to result in no adverse geotechnical impacts to the Sacramento River Flood Control Project (SRFCP) or the FRWL. The overall geotechnical analyses for Project Area C were approved by the Board in May 2013.

The current design is consistent with the previously approved geotechnical analyses and complies with applicable Title 23 Standards, with the exception of the requested variances outlined in Section 7.5 below. The proposed gap closures would remediate levee deficiencies by providing continuous 200-year protection throughout the project area.

7.5– Project Variances

SBFCA is requesting two variances to Title 23 Standards, § 123 Pipelines, Conduits, and Utility Lines based on the proposed gap closure designs. In accordance with Title 23, § 11(b), Variances, SBFCA is requesting the variances to Title 23 Standards because they would be infeasible due to project field conditions as outlined below, and as requested in their Variance Request Letter (incorporated into the amended permit as Exhibit H).

Variance to Title 23 Standards, § 123(d)(20) – *"Within the levee or within ten (10) feet of levee toes, any excavation for the installation of a pipeline, conduit, or utility line must be backfilled in four (4) to six – (6) inch layers with approved material and compacted to a relative compaction of not less than ninety (90) percent, per ASTM*

D1557-91, dated 1991, which is incorporated by reference and at or above optimum moisture content or ninety-seven (97) percent, per ASTM-D698-91, dated 1991, which is incorporated by reference and at or above optimum moisture content. Compaction tests by a certified soils laboratory will be required to verify compaction of backfill within a levee."

- SBFCA is requesting the use of Controlled Low Strength Material (CLSM) for backfill of pipes for the gap closures, which requires a variance to the above standard because the approved material in this standard is written for compaction of soils and not for materials that produce the suitable strengths and permeability's without compaction. Compaction around large diameter pipes can be infeasible under certain field conditions and has proved problematic in many cases, specifically during construction of the FRWLP. CLSM has been used in order to avoid compaction issues and meet or exceed current strength and permeability standards as a needed field construction variance for Project Areas B and D. CLSM is a commonly used construction material. It has been approved by the USACE for Project Areas B and D and also meets current Yuba City requirements as well.
- SBFCA's Independent panel of experts, USACE, DWR and Board staff has previously reviewed a similar request for other reaches of the FRWLP, and concur that the anticipated CLSM permeability of $1x10^{-5}$ cm/sec would behave in a manner similar to Type 2 Levee Embankment. Therefore, Board staff concurs with SBFCA's requested variance to Title 23 Standards, § 123(d)(20) because current standards are infeasible for this project.

Variance to Title 23 Standards, § 123(g)(7)(D) – *"Unless a continuous internal lining of cement, mortar, or equivalent is provided, as appropriate for the fluid to be conveyed, new steel pipe installations may convey only non-corrosive material, and waters is considered corrosive."*

- SBFCA is requesting the use of epoxy lined pipe as an "equivalent" to cement or mortar lined pipes for pipes with diameter's less than eighteen inches. For pipes with small diameters it is infeasible to provide continuous cement or mortar lining based on those materials, which is why the standard allows for an equivalent internal lining. Since the pipe lining standard is intended to prohibit corrosion of steel pipes, and epoxy lined pipes are an industry standard for small diameter domestic water lines, epoxy lined pipes can be used as an approved "equivalent" for this standard.

Board staff concurs with SBFCA's requested variance to Title 23 Standards, § 123(g)(7)(D) because the listed lining materials are infeasible for small diameter pipes, and epoxy lined pipes are an accepted industry standard and "equivalent" as

referenced in the standard for small diameter water pipes. Board staff has determined that the proposed project, including the requested variances to Title 23 Standards, will result in an improved levee system, ensure continuity with Project Area C (construction completed), and is not expected to pose a threat to levee stability.

7.6 – Draft Amendments to Permit 18793-1

Board staff has made the following amendments to previously issued Permit 18793-1 (Attachment B):

- added Special Conditions NINETY-FIVE through ONE-HUNDRED-TWO
- superseded Special Conditions THIRTEEN, TWENTY-ONE through TWENTY-THREE, THIRTY-THREE, THIRTY-SEVEN, FIFTY, FIFTY-FIVE, and FIFTY-EIGHT
- made selected non-substantive editorial changes for readability and to incorporate the proposed gap closures
- removed (by strikeout) Special Conditions NINETY through NINETY-THREE as they are included in the USACE LOP and ROD (Exhibits A and B, respectively)

8.0 – CEQA ANALYSIS

Board staff has prepared the following California Environmental Quality Act (CEQA) Determination:

The Board, acting as a responsible agency under CEQA, has independently reviewed the Feather River West Levee Project Draft Environmental Impact Report (DEIR) (SCH No. 2011052062, December 2012) the Final Environmental Impact Report (FEIR) (SCH No. 2011052062, April 2013) and the Mitigation Monitoring and Reporting Plan (MMRP) submitted by SBFCA. These documents consider the environmental impacts and required mitigation measures for the entire Feather River West Levee Project including Project Area C. SBFCA as lead agency determined the project would have a significant effect on the environment and adopted Resolutions 2013-05 and 2013-06 on April 10, 2013 (including Statement of Facts, Findings, Impacts and Mitigation Measures, Statement of Overriding Considerations, and Mitigation Monitoring and Reporting Program) and subsequently filed a Notice of Determination with the State Clearinghouse on April 12, 2013. These documents including project design may be viewed or downloaded from the Board website at http://www.cvfpb.ca.gov/meetings/2016/05-20-2016.cfm under a link for this agenda item. The documents are also available for review in hard copy at the Board and SBFCA offices.

On May 24, 2013 the Board approved Project Area C of the Feather River West Levee Project and issued Board Flood System Improvement Permit 18793-1. The Board, as a Responsible Agency, also made appropriate Agency CEQA findings for unavoidable environmental impacts for the entire Feather River West Levee Project (approximately 41 miles of project works inclusive of Project Areas A, B, C and D). The Board now finds that the proposed amended design for Permit 18793-1 to add proposed gap closures to Project Area C of the FRWLP is within the scope of the previously adopted FEIR including Statement of Facts, Findings, Impacts and Mitigation Measures, Statement of Overriding Considerations, and Mitigation Monitoring and Reporting Program.

The Board also now finds that construction of the proposed gap closures described herein would result in no new adverse environmental impacts, and no new mitigation measures are required pursuant to CEQA Guidelines Section 15162. Therefore no new environmental document is required pursuant to CEQA Guidelines Section 15168. The Board's findings on the significant environmental effects of the project are further described in its previously adopted Resolution 2013-07 (Attachment F).

The documents and other materials which constitute the record of the Central Valley Flood Board's proceedings in this matter are in the custody of the Executive Officer, Central Valley Flood Protection Board, 3310 El Camino Ave., Suite 170, Sacramento, California 95821.

9.0 – CALIFORNIA WATER CODE SECTION 8610.5 CONSIDERATIONS

Refer to Resolution 2016-11 (Attachment A) for Water Code 8610.5 considerations.

10.0 – STAFF RECOMMENDATION

Board staff has determined that the proposed gap closures are consistent with the adopted CVFPP, are not injurious to the SRFCP, and will provide an overall betterment to reduce the risk of flooding in the protected areas. Staff therefore recommends that the Board:

Adopt (in substantially the form provided):

- The CEQA findings and Resolution 2016-11 (Attachment A);

Approve:

- Requested construction variances to Title 23 Standards, § 123 pursuant to § 11(a) and (b) per SBFCA's Variance Request Letter (Exhibit H to Draft Amended Permit);

- Draft Amended Flood System Alteration Permit 18793-1, in substantially the form provided, and conditioned upon receipt and incorporation of the anticipated USACE Sacramento District Letter of Permission, to supersede the previously issued permit; and

Delegate Authority to the Executive Officer to:

- Make non-substantive changes to the draft amended permit if needed to incorporate the anticipated USACE decision;
- Issue technical construction variances as needed to incorporate requested design changes due to unanticipated field conditions that may be encountered during construction;

Direct the Executive Officer to:

- Take the necessary actions to issue Amended Permit 18793-1;
- Prepare and file a Notice of Determination pursuant to CEQA with the State Clearinghouse;

11.0 – LIST OF ATTACHMENTS

A – Board Resolution 2016-11

B – Draft Amended Permit 18793-1

- Exhibit A – USACE LOP (expected May/early June) to supersede previous
- Exhibit B – USACE ROD for Project Area C, excluding Reach 13
- Exhibit C – USACE ROD for Project Area C, Reach 13 only
- Exhibit D – MA 16 Endorsement (not applicable to proposed gap amendment)
- Exhibit E – LD 1 Endorsements
- Exhibit F – LD 9 Endorsements
- Exhibit G – 2013 Approved Variance Request Table
- Exhibit H – SBFCA Gap Amendment Variance Request Letter
- Exhibit I – USACE Field Material Change Approval

C– Project Maps

D – Gap Closure Design Plans

E – Previous Staff Reports (May and September 2013, without attachments)

F – Board Resolution 2013-07

Prepared By:	Nancy Moricz, PE, Senior Engineer, Plan Implementation and Compliance Branch
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Staff Report:	Eric Butler, PE, Supervising Engineer, Plan Implementation and Compliance Branch Chief Jit Dua, Legal Counsel Leslie Gallagher, Executive Officer

STATE OF CALIFORNIA
NATURAL RESOURCES AGENCY
CENTRAL VALLEY FLOOD PROTECTION BOARD

DRAFT RESOLUTION NO. 2016-11

FINDINGS AND DECISION AUTHORIZING ISSUANCE OF
FLOOD SYSTEM ALTERATION PROJECT
PERMIT 18793-1 AMENDMENT

SUTTER BUTTE FLOOD CONTROL AGENCY
FEATHER RIVER WEST LEVEE PROJECT
PROJECT AREA C (REACHES 13 THROUGH 24)
SUTTER COUNTY

WHEREAS, the Central Valley Flood Protection Board (Board), in support of the Sutter Butte Flood Control Agency (SBFCA), approved on October 26, 2012 a request to the U.S. Army Corps of Engineers (USACE) for 33 U.S.C. Section 408 (Section 408) approval to alter 41 miles of federal Sacramento River Flood Control Project (SRFCP) levee for the Feather River West Levee Project (FRWLP), located on the west side (right bank) of the Feather River from Thermalito Afterbay in Butte County downstream to approximately 3.5 miles north of the Feather River's confluence with Sutter Bypass in Sutter County; and

WHEREAS, SBFCA submitted an application and supporting documentation to the Board in March 2013 to construct Project Area C, the first phase of the FRWLP, including approximately 14.8 miles of levee improvements in Reaches 13 to 24 within Sutter County; and

WHEREAS, SBFCA released a Notice of Preparation initiating a 30-day public comment period on May 20, 2011 and extended the comment period to July 8, 2011; and

WHEREAS, SBFCA as lead agency pursuant to the California Environmental Quality Act, Public Resources Code sections 21000 *et seq*. ("CEQA") prepared a Draft Environmental Impact Report (DEIR) (SCH No. 2011052062, December 2012), and Final Environmental Impact Report (FEIR) (SCH No. 2011052062, April 2013), and Mitigation Monitoring and Reporting Plan (MMRP) for the FRWLP (incorporated herein by reference and available at Board or SBFCA offices); and

WHEREAS, the SBFCA Board approved the FRWLP (SBFCA Resolutions 2013-05 and 2013-06), the FEIR, and MMRP, and approved findings and a Statement of Overriding Considerations pursuant to the CEQA Guidelines (incorporated herein by reference), and filed a Notice of Determination with the State Clearinghouse on April 12, 2013; and

WHEREAS, the Board, as a responsible agency pursuant to CEQA, has independently reviewed the analyses in the Feather River West Levee Project Draft Environmental Impact Report (DEIR) (SCH No. 2011052062, December 2012), the Final Environmental Impact Report (FEIR) (SCH

No. 2011052062, April 2013), and the Mitigation Monitoring and Reporting Plan (MMRP) submitted by SBFCA, and has reached its own conclusions regarding them; and

WHEREAS, the Department of Water Resources (DWR) Maintenance Area 16 endorsed the Project Area C application on May 16, 2013; and

WHEREAS, the Board of Levee District 1 (Sutter County) endorsed the Project Area C application on April 16, 2013; and

WHEREAS, the Board of Levee District 9 (Sutter County) endorsed the Project Area C application on April 16, 2013; and

WHEREAS, Board staff completed a comprehensive technical review of SBFCA's Project Area C permit application including 100 percent design plans, specifications, and supporting documentation; and

WHEREAS, in accordance with California Code of Regulations, Title 23, Division 1 (Title 23), § 11(a), the Board may grant variances to its standards for uses that are not consistent with the Board's standards; and § 11(b), when approval of a permit requires variances, the applicant must clearly state in its application why compliance with the Board's standards is infeasible or not appropriate; and

WHEREAS, Board, SBFCA, DWR, and USACE staffs have developed a strategy to: (1) update existing pipeline crossing encroachment permits to ensure that they conform to current Title 23, Article 8 (Standards) and USACE policies, and (2) issue new encroachment permits to owners of currently unpermitted encroachments to ensure that all regulatory parties, levee maintainers, and owners will be able to accurately and efficiently track and inspect future operations and maintenance of these encroachments; and

WHEREAS, SBFCA has agreed to act on each owner's behalf to prepare all required encroachment permit application documents, obtain owner signatures, and support the Board staff's application review and permitting activities; and

WHEREAS, The Board conducted a public hearing on May 24, 2013 for Permit Application18793-1 and has reviewed the Staff Report and Attachments, the documents and correspondence in its file, and the environmental documents prepared by SBFCA; and

WHEREAS, the Board at the public hearing on May 24, 2013, adopted Resolution 2013-07 for Project Area C, which adopted CEQA Findings, approved Permit 18793-1 with variances to Title 23 Standards pursuant to Title 23, § 11(b) and delegated authorities to the Board's Executive Officer; and

WHEREAS, the Board received USACE Headquarters Section 408 Record of Decision (ROD) to construct Reach 13 of Project Area C of the FRWLP on July 13, 2013; and

WHEREAS, the Board received USACE Sacramento District Letter of Permission (LOP) to construct Reach 13 of Project Area C of the FRWLP on July 22, 2013; and

WHEREAS, Board staff added or modified Special Conditions THIRTY-THREE, FIFTY, FIFTY-FIVE, FIFTY-SIX, and FIFTY-NINE of Permit18793-1in order to incorporate the above referenced variances to Title 23 Standards into the permit; and

WHEREAS, the Board issued Permit18793-1 for only Reach 13 of the FRWLP Area C on July 23, 2013; and

WHEREAS, the Board subsequently received a USACE Headquarters Section 408 approval ROD to construct the remaining reaches of Project Area C of the FRWLP on September 13, 2013; and

WHEREAS, the Board subsequently received a USACE Sacramento District LOP to construct the remaining reaches of Project Area C of the FRWLP on September 19, 2013; and

WHEREAS, Board staff added or modified Special Conditions EIGHTY-FOUR through EIGHTY-NINE of Permit18793-1 in order to incorporate additional design variances to Title 23 Standards into the permit; and

WHEREAS, the Board conducted a public hearing on September 27, 2013, and approved sending a letter to USACE Sacramento District to request project design changes based on field conditions and delegate authority to the Board's Executive Officer to make modifications to Permit18793-1, subject to USACE Sacramento District approval, to deviate from the approved plans based on field conditions; and

WHEREAS, the Board issued Permit18793-1 for Project Area C of the FRWLP on October 4, 2013, which superseded previously issued Permit18793-1; and

WHEREAS, SBFCA submitted an application and supporting documentation to the Board in April 2015 to construct the Project Area C gap closures as an amendment to Permit No. 18793-1 in Reaches 16, 17, and 18 within Sutter County; and

WHEREAS, the Board of Levee District 1 (Sutter County) conditionally endorsed the Project Area C gap closure amendments on April 16, 2016; and

WHEREAS, the Board of Levee District 9 (Sutter County) conditionally endorsed the Project Area C gap closure amendments on May 19, 2015; and

WHEREAS, the USACE Headquarters Section 408 ROD was received on September 13, 2013 to construct the remaining reaches of Project Area C of the FRWLP and included approval for the gap closures; and

WHEREAS, Board staff anticipates receipt of a revised USACE Sacramento District LOP for Project Area C, including the gap closure amendments, in June 2016, which will supersede both previously issued LOP's for Project Area C; and

WHEREAS, upon receipt of the USACE Sacramento District LOP , Board staff will review and incorporate all USACE conditions into the draft amended Permit 18793-1 as Exhibit A prior to issuance; and

WHEREAS, Board staff completed a comprehensive technical review of SBFCA's Project Area C gap closure amendments including 100 percent design plans, specifications, and supporting documentation; and

WHEREAS, amended Permit18793-1 shall supersede previously issued Permit18793-1; and

WHEREAS, in accordance with Title 23, § 11(b) SBFCA has requested, by letter dated April 28, 2016, the Board to grant additional variances to Title 23 Standards as summarized in Exhibit H of draft amended Permit18793-1; and

WHEREAS, Board staff has added Special Conditions NINETY-FIVE through ONE-HUNDRED-TWO to draft amended Permit18793-1 to incorporate the referenced requested variances to Title 23 Standards; and

WHEREAS, Board staff has made selected non-substantive changes for readability and to incorporate the proposed gap closures; removed (by strikeout); or superseded Special Conditions to amended Permit 18793-1, as reflected in Attachment B to the Staff Report; and

WHEREAS, the SBFCA Project Area C construction project will:

- Address major geotechnical concerns such as through- and under-seepage and related slope stability, and the condition and impact of existing encroachments;
- Reduce the risk of flooding for existing urban areas, agricultural commodities, infrastructure, and other properties;
- Increase the level of flood protection to a targeted 200-year level of protection, consistent with the adopted CVFPP and pursuant to the legislative mandates of the Central Valley Flood Protection Act of 2008 (Water Code § 9600 – 9625) for Yuba City and Live Oak to provide 200-year flood protection for urban and urbanizing areas;
- Bring encroachments surveyed by SBFCA into Title 23 Standards' compliance, while addressing 100 percent of the encroachment issues categorized by the USACE in their 2010 periodic inspections as "Unacceptable – likely to prevent performance in the next flood event".

WHEREAS, DWR has partnered with SBFCA to achieve the goal of 200-year protection for the urban area protected by the FRWL system for approximately $223.1 million in State funding, has funded other projects along the Feather River that provide protection to the basin, and SBFCA anticipates construction completion in 2016; and

WHEREAS, The Board has conducted a public hearing to consider amending previously issued Permit18793-1 to incorporate the proposed gap closures, and has reviewed the Staff Report and Attachments, the documents and correspondence in its file, and the environmental documents prepared by SBFCA.

NOW, THEREFORE, BE IT RESOLVED THAT,

Findings of Fact.

1. The Board hereby adopts as findings the facts set forth in the accompanying Staff Report.

2. The Board has reviewed all Attachments, Exhibits, Figures, and References listed in the Staff Report.

CEQA Findings.

3. The Board finds that its prior CEQA findings made on May 24, 2013 regarding the proposed amended design for Permit18793-1 to construct Project Area C with gap closures of the FRWLP are still valid and the proposed projects are within the scope of the previously adopted FEIR including Statement of Facts, Findings, Impacts and Mitigation Measures, Statement of Overriding Considerations, and Mitigation Monitoring and Reporting Program.

4. The Board finds that construction of the proposed projects described herein would result in no new adverse environmental impacts, and no new mitigation measures are required pursuant to CEQA Guidelines Section 15162. Therefore, no new environmental document is required pursuant to CEQA Guidelines Section 15168.

5. **Custodian of Record**. The custodian of the CEQA record for the Board is its Executive Officer, at the Board offices of 3310 El Camino Avenue, Suite 170, Sacramento, California 95821. These documents may be viewed or downloaded from the Board website at http://cvfpb.ca.gov/meetings/2016/05-20-2016.cfm on the May 20, 2016 Board meeting page. The documents are also available for review in hard copy at the Board and SBFCA offices.

Considerations pursuant to California Water Code Section 8610.5

6. **Evidence Admitted into the Record**. The Board has considered all new evidence presented in this matter, including the gap closure design submittal to support the proposed amendment to Permit No. 18793-1, and all supporting technical documentation provided by SBFCA, as well as all evidence submitted up through the hearing on this matter.

   The custodian of the file is the Executive Officer, Central Valley Flood Protection Board, 3310 El Camino Avenue, Suite 170, Sacramento, California 95821.

7. **Best Available Science**. In making its findings, the applicant has used the best available science relating to the issues presented by all parties. On the important issue of hydraulic impacts, SBFCA used the HEC-RAS one-dimensional modeling software for the

development of their overall FRWLP hydraulics model that was previously approved at the May 24, 2013 Board meeting. This model is considered as one of the best available scientific tools for the purpose of evaluating potential hydraulic impacts on water surface elevation and velocity at a sufficient level of analytical detail for the proposed project. The project does not propose any modifications to the 2013 approved hydraulics.

8. **Effects of the Decision on the State Plan of Flood Control**. The proposed project is expected to result in no significant adverse hydraulic or geotechnical impacts on the facilities of the State Plan of Flood Control (SPFC) and is consistent with the 2012 Adopted Central Valley Flood Protection Plan (CVFPP) and current applicable and feasible Title 23 Standards because the project is anticipated to produce no increases in water surface elevation, significant increases in channel velocities, or adverse geotechnical impacts on SPFC facilities. In addition, existing, proposed, and future phases of the FRWLP are included in the Feather River Regional Flood Management Plan, Basin-wide Feasibility Study, and the Federal Sutter Basin Project.

   The Board further finds that the proposed project alterations can be constructed in a manner not injurious to the public interest, and that will not impair the usefulness of the SRFCP.

9. **Effects of Reasonably Projected Future Events**. The proposed project provides compliance with Federal and State regulations and guidance and is consistent with the goal to provide 200-year protection to urban areas. The project area results in no significant adverse hydraulic or geotechnical impacts; therefore this project is not anticipated to create any adverse impacts to surrounding projects.

Other Findings/Conclusions regarding Issuance of the Permit.

10. Based on the foregoing the Board finds that the proposed gap closure amendments to Permit18793-1 to construct Project Area C of the FRWLP:
    - Will result in an overall betterment to the SRFCP and SPFC
    - Are consistent with the CVFPP and California Water Action Plan
    - Will not be injurious to the public interest, and
    - Will not impair the usefulness of the SRFCP

11. This resolution shall constitute the written decision of the Board in the matter of amending Permit18793-1.

Approval of Amending Permit No. 18793-1.

12. Based on the foregoing, the Board adopts the CEQA findings and Resolution 2016-11.

13. The Board hereby approves variances to Title 23 Standards, § 123 pursuant to Title 23, § 11(a) and (b) with regard to Variances to Board Standards, summarized in Section 7.5 of the Staff Report and Exhibit H to draft amended Permit18793-1.

14. The Board hereby approves amended flood system alteration Permit18793-1, in substantially the form provided by the Board Staff at the May 20, 2016 meeting of the Board, subject to receipt, review and incorporation of conditions required by the USACE in their Letter of Permission anticipated to be received in June 2016, and

15. The Board delegates authority to the Executive Officer to make non-substantive changes to the draft amended permit if needed to incorporate the anticipated USACE decision, and to issue technical construction variances as needed to incorporate requested design changes due to unanticipated field conditions that may be encountered during construction, and

16. The Board directs the Executive Officer to take the necessary actions to issue Amended Permit 18793-, and to prepare and file a Notice of Determination pursuant to the California Environmental Quality Act for the Feather River West Levee, Project Area C with gap closure amendment project, and

PASSED AND ADOPTED by vote of the Board on _____, 2016

_____	_____
William H. Edgar	Jane Dolan
President	Secretary

DRAFT

STATE OF CALIFORNIA
THE RESOURCES AGENCY

THE CENTRAL VALLEY FLOOD PROTECTION BOARD

PERMIT NO. 18793-1 BD

This Permit is issued to:

Sutter Butte Flood Control Agency
1227 Bridge Street, Suite C
Yuba City, California 95991

This flood system improvement permit is granted to the Sutter Butte Flood Control Agency (SBFCA) to construct Project Area C, including gap closure work, as part of the Feather River West Levee Project (FRWLP). The project includes: construction of cut-off walls and seepage berms; removal, relocation, and modification of several existing levee encroachments to bring them into compliance with federal and State standards (through revised or new Board encroachment permits); including relocation or removal of other existing encroachments that may require additional or modified encroachment permits be issued to the individual encroachment owners; and gap closure work in Reaches 16, 17, and 18 which include cutoff wall construction, installation of relief and monitoring wells with telemetry, construction of a concrete lined ditch and stability berm, utility modifications, and installation of temporary and permanent features for the Union Pacific Railroad crossing closure.

This Permit is valid for all of Project Area C (Reached 13-24), including gap closure construction.

FRWLP Area C extends upstream from Shanghai Bend (Project Reach 13 in Sutter County) for a distance of approximately 14.83 miles to approximately a quarter-mile north of Campbell Road in the City of Live Oak (Project Reach 24 in Butte County). (Section 3, T14N, R3E, MDB&M, Levee Districts 1 and 9 (Sutter County) and Department of Water Resources Maintenance Area 16, Feather River, Sutter County).

NOTE: Special Conditions have been incorporated herein which may place limitations on and/or require modification of your proposed project as described above.

(SEAL)

Dated: _____

_____
Executive Officer

GENERAL CONDITIONS:

ONE: This permit is issued under the provisions of Sections 8700 – 8723 of the Water Code.

TWO: Only work described in the subject application is authorized hereby.

THREE: This permit does not grant a right to use or construct works on land owned by the Sacramento and San Joaquin Drainage District or on any other land.

FOUR: The approved work shall be accomplished under the direction and supervision of the State Department of Water Resources, and the permittee shall conform to all requirements of the Department and The Central Valley Flood Protection Board.

FIVE: Unless the work herein contemplated shall have been commenced within one year after issuance of this permit, the Board reserves the right to change any conditions in this permit as may be consistent with current flood control standards and policies of The Central Valley Flood Protection Board.

SIX: This permit shall remain in effect until revoked. In the event any conditions in this permit are not complied with, it may be revoked on 15 days' notice.

SEVEN: It is understood and agreed to by the permittee that the start of any work under this permit shall constitute an acceptance of the conditions in this permit and an agreement to perform work in accordance therewith.

EIGHT: This permit does not establish any precedent with respect to any other application received by The Central Valley Flood Protection Board.

NINE: The permittee shall, when required by law, secure the written order or consent from all other public agencies having jurisdiction.

TEN: The permittee is responsible for all personal liability and property damage which may arise out of failure on the permittee's part to perform the obligations under this permit. If any claim of liability is made against the State of California, or any departments thereof, the United States of America, a local district or other maintaining agencies and the officers, agents or employees thereof, the permittee shall defend and shall hold each of them harmless from each claim.

ELEVEN: The permittee shall exercise reasonable care to operate and maintain any work authorized herein to preclude injury to or damage to any works necessary to any plan of flood control adopted by the Board or the Legislature, or interfere with the successful execution, functioning or operation of any plan of flood control adopted by the Board or the Legislature.

TWELVE: Should any of the work not conform to the conditions of this permit, the permittee, upon order of The Central Valley Flood Protection Board, shall in the manner prescribed by the Board be responsible for the cost and expense to remove, alter, relocate, or reconstruct all or any part of the work herein approved.

SPECIAL CONDITIONS FOR PERMIT NO. 18793-1 BD

THIRTEEN: (Superseded by Special Condition NINETY-FIVE) ~~This permit conditions construction of Project Area C, Reaches 13 to 24 of the Feather River West Levee Project, which includes the area from Plan Station 844+75 (Shanghai Bend) to Station 1628+00 (1,700 feet north of Campbell Road) and equals 7,900 feet (14.83 miles) of refurbished levee development. This permit is issued subject to the approvals and conditions as specified in (1) the U.S. Army Corps of Engineers (USACE) Letter of Permission (LOP) dated July 22, 2013 and Record of Decision (ROD) dated July 19, 2013 (Exhibits A1 and A2) which approved alterations to Reach 13, and (2) the USACE LOP dated September 19, 2013 and ROD dated September 13, 2013 (Exhibits A3 and A4) which approved alterations to Reaches 14 to 24.~~

LIABILITIES / IMDEMNIFICATION

FOURTEEN: The permittee is responsible for all personal liability and property damage which may arise out of failure on the permittee's part to perform the obligations under this permit. If any claim of liability is made against the Central Valley Flood Protection Board (Board), the Department of Water Resources (DWR), the United States of America, a local district or other maintaining agencies and the officers, agents or employees thereof, arising out of failure on the permittee's part to perform the obligations under this permit, the permittee shall defend and shall hold each of them harmless from each claim. This condition shall supersede condition TEN~~, above~~.

FIFTEEN: The permittee shall defend, indemnify, and hold the ~~Central Valley Flood Protection~~ Board and the State of California, including its agencies, departments, boards, commissions, and their respective officers, agents, employees, successors and assigns (collectively, the "State"), safe and harmless, of and from all claims and damages related to the ~~Central Valley Flood Protection~~ Board's approval of this permit, including but not limited to claims filed pursuant to the California Environmental Quality Act. The State expressly reserves the right to supplement or take over its defense, in its sole discretion.

SIXTEEN: The permittee is responsible for all liability and shall defend, indemnify, and hold the Central Valley Flood Protection Board and the State of California; including its agencies, departments, boards, commissions, and their respective officers, agents, employees, successors and assigns (collectively, the "State"), safe and harmless, of and from all such claims and damages arising from construction of the project undertaken pursuant to this permit, all to the extent allowed by law. The State expressly reserves the right to supplement or take over its defense, in its sole discretion.

SEVENTEEN: The ~~Central Valley Flood Protection~~ Board, ~~Department of Water Resources~~DWR, and Levee Districts 1 and 9 (Sutter County) shall not be held liable for damages to the permitted alterations resulting from releases of water from reservoirs, flood fight, operation, maintenance, inspection, or emergency repair.

EASEMENT, LICENSE OR TEMPORARY ENTRY PERMIT

EIGHTEEN: If the construction project extends onto land owned in fee and / or easement by the Sacramento and San Joaquin Drainage District acting by and through the ~~Central Valley Flood Protection~~ Board ~~(hereafter Board)~~, the permittee should secure an easement, license, or temporary entry permit from the Board prior to commencement of work. Contact ~~Angelica Aguilar~~Tom O'Neil at (916) 653-7654 ~~at (916) 653-5782~~.

BOARD CONTACTS

NINETEEN: The permittee shall contact the Board by telephone at (916) 574-0609~~, and the Board's Construction Supervisor at (916) 651-1299~~ to schedule a preconstruction conference. Failure to do so at least 20 working days prior to start of work may result in delay of the project.

PERMITTING AND AGENCY CONDITIONS

TWENTY: Project Area C ~~in its entirety is the first phase~~is a portion of ~~the Sutter Butte Flood Control Agency's~~SBFCA~~'s~~ ~~Feather River West Levee Project~~FRWLP, permitted pursuant to 33 U.S.C. Section 408 authority of the U.S. Army Corps of Engineers (USACE). The Feather River west levee is a facility of the Sacramento River Flood Control Project (SRFCP) and State Plan of Flood Control (SPFC) regulated by the Board. By acceptance of this permit, the permittee acknowledges the authority of the Board to regulate all future flood system improvement projects and encroachments along the project levee reach.

TWENTY-ONE: (Superseded by Special Condition NINETY-FIVE) ~~The permittee shall comply with all conditions set forth in the Letters of Permission dated July 22, 2013 (Exhibit A1) and September 19, 2013 (Exhibit A3), and Records of Decision dated July 19, 2013 (Exhibit A2) and September 13, 2013 (Exhibit A4) from the Department of the Army (U.S. Army Corps of Engineers, Sacramento District), which are attached to this permit and are incorporated by reference.~~

TWENTY-TWO: (Superseded by Special Condition NINETY-SIX) ~~The permittee shall address all concerns expressed by the Department of Water Resources (Maintenance Area 16) in its letter dated May 16, 2013, which is attached to the permit as Exhibit B and is incorporated by reference.~~

TWENTY-THREE: (Superseded by Special Condition NINETY-SIX) ~~The endorsements of Levee Districts 1 and 9 (Sutter), dated April 13, 2013, are attached to this permit as Exhibit C and are incorporated by reference.~~

TWENTY-FOUR: (not required for construction of gap closures). The permittee should contact the U.S. Army Corps of Engineers, Sacramento District, Regulatory Branch, 1325 J Street, Sacramento, California 95814, telephone (916) 557-5250, as compliance with Section 10 of the Rivers and Harbors Act and/or Section 404 of the Clean Water Act may be required.

TWENTY-FIVE: The permittee agrees to incur all costs for compliance with local, State, and federal permitting and resolve conflicts between any of the terms and conditions that agencies might impose under the laws and regulations they administer and enforce.

TWENTY-SIX: The permittee shall cooperate with the Board such that any encroachment that must be relocated, modified or otherwise altered to accommodate construction of flood system improvements permitted herein is relocated, modified or otherwise altered in a manner that complies with current applicable State and federal standards. If the affected encroachment has an existing Board permit or is subject to some other applicable Board authorization, the permittee shall cooperate with the Board such that the permit or other authorization is appropriately amended to reflect the changed condition as shown on as-built drawings for the encroachment and overall project. If the encroachment does not have a Board permit or other Board authorization, the permittee shall cooperate with the Board to determine whether a Board permit is required. If so, the permittee shall cooperate with the Board to ensure that the required permit application is made and, if granted, the permit reflects the changed condition as shown on as-built drawings for the encroachment and the overall project.

TWENTY-SEVEN: If the permittee or successor does not comply with the conditions of the permit and

enforcement by the Board is required, the permittee or successor shall be responsible for bearing all costs associated with the enforcement action, including reasonable attorney's fees.

TWENTY-EIGHT: Upon completion of this flood system improvement project, the permittee will cooperate with the Board to update the applicable project Operations and Maintenance Manual covering the project area, and to cooperate with the Board to obtain federal acceptance of the project works into the ~~Sacramento River Flood Control Project~~SRFCP by the ~~U.S. Army Corps of Engineers~~USACE, followed by federal turnover to the State for Operations and Maintenance through existing assurance agreements.

TWENTY-NINE: The permittee may be required, at permittee's cost and expense, to remove, alter, relocate, or reconstruct all or any part of the permitted project works if removal, alteration, relocation, or reconstruction is necessary as part of or in conjunction with implementation of the Central Valley Flood Protection Plan or other future flood control plan or project, or if damaged by any cause. If the permittee does not comply, the Board may perform this work at the permittee's expense.

PRE-CONSTRUCTION

THIRTY: The permittee shall provide construction supervision and inspection services acceptable to the Board.

THIRTY-ONE: The permittee shall contact the U. S. Army Corps of Engineers regarding inspection of the project during construction as the proposed work is an alteration to an existing federal flood control project that will be incorporated into the Sacramento River Flood Control Project, a facility of the State Plan of Flood Control.

THIRTY-TWO: Prior to commencement of excavation, the permittee shall create a photo record, including associated descriptions, of the levee conditions. The photo record shall be certified (signed and stamped) by a licensed land surveyor or professional engineer registered in the State of California and submitted to the Board within 30 days of beginning the project.

THIRTY-THREE: No construction work of any kind shall be done during the flood season from November 1 to April 15 without prior written approval of the Board. (Superseded by Special Condition NINETY-SEVEN) ~~This condition excludes removal and replacement of four pipeline crossings approved by the Board pursuant to Title 23, Section 11 under variance to Title 23, Section 112 to perform work during the flood season, at stations 1430+40, 1430+47, 1430+55, and 1610+92. Board Staff Report Attachment K describes these variances and is attached to this permit as Exhibit D and is incorporated by reference. Other construction time variances may be requested by the permittee and approved by the Board's Chief Engineer for two- week periods dependent on weather forecasts. Such time variances may be revoked at any time if inclement weather is pending.~~

THIRTY-FOUR: Thirty (30) calendar days prior to the start of any demolition and / or construction activities within the floodway or within the existing levee prism, the permittee shall submit to the Board's Chief Engineer two sets of detailed plans and specifications and supporting geotechnical and / or hydraulic impact analyses, for any and all temporary, in channel, or levee prism work that may have an impact during the flood season from November 1 through April 15. The Board may request additional information as needed and will seek comment from ~~the U.S. Army Corps of Engineers~~USACE and / or the local maintaining agenc~~y~~ies when necessary. The Board will provide

written notification to the permittee if the review period is likely to exceed thirty (30) working days.

THIRTY-FIVE: A profile of the existing levee crown roadway and access ramps that will be utilized for access to and from the borrow area shall be submitted to the Board prior to commencement of excavation.

THIRTY-SIX: Keys shall be provided to local levee maintenance agencies and the Department of Water Resources for all locks on gates providing access to the floodway, levee ramp, levee toe, and along the levee crown.

CONSTRUCTION

THIRTY-SEVEN: (Superseded by Special Condition NINETY-SEVEN) ~~All work approved by this permit shall be in accordance with the final (100% "Issued For Bid" set) of submitted drawings and specifications dated March 13, 2013, and including Addenda Nos. 1, 2, and 3 except as modified by special permit conditions herein. No further work, other than that approved by this permit, shall be done in the area without prior approval of the Board.~~

THIRTY-EIGHT: All addenda and contract change orders made to the submitted documents by the permittee after Board approval of this permit shall be submitted to the Board's Chief Engineer for review and approval prior to incorporation into the permitted project. The submittal shall include all supplemental plans, specifications, and necessary supporting geotechnical, hydrology and hydraulics, or other technical analyses. The Board shall acknowledge receipt of the addendum or change submittal in writing within ten (10) working days of receipt, and shall work with the permittee to review and respond to the request as quickly as possible. Time is of the essence. The Board may request additional information as needed and will seek comment from the ~~U.S. Army Corps of Engineers~~USACE and / or local maintaining agencies when necessary. The Board will provide written notification to the permittee if the review period is likely to exceed forty five (45) calendar days. Upon approval of submitted documents the permit shall be revised, if needed, prior to construction related to the proposed changes.

THIRTY-NINE: Any additional project features proposed by the permittee in the floodway, on or in the levee section, and within 15 and ~~thirty (~~30~~)~~ feet respectively of the landward and waterward levee toes will require either incorporation by amendment to this permit, or will require issuance of a separate encroachment permit to the encroachment owner from the Board.

FORTY: Existing or proposed utility poles and guy anchors shall be relocated or installed a minimum distance of 10 feet landward of the landward levee toe.

FORTY-ONE: All debris generated by this project shall be disposed of outside the floodway, levee prism and proposed right-of-way.

FORTY-TWO: No material stockpiles, temporary buildings, or equipment shall remain in the floodway during the flood season from November 1 to April 15 without prior approval from the ~~Central Valley Flood Protection~~ Board.

FORTY-THREE: During construction of the project, any and all anticipated or unanticipated conditions encountered which may impact levee integrity or flood control shall be brought to the

attention of the Board inspector immediately and prior to continuation of construction. Any encountered abandoned encroachments shall be completely removed or properly abandoned under the direction of the Board inspector.

FORTY-FOUR: The stability of the levee shall be maintained at all times during construction.

FORTY-FIVE: Excavations below the design flood plain and within the levee section or within fifty (50) feet of the projected waterward and landward levee slopes shall have side slopes no steeper than 1 horizontal to 1 vertical. Flatter slopes may be required to ensure stability of the excavation.

FORTY-SIX: Any damage to the levee crown roadway or access ramps that will be utilized for access for this project shall be promptly repaired to the condition that existed prior to this project.

FORTY-SEVEN: Equipment used in the construction of the cutoff wall shall not exceed the live-load surcharge to a level that causes or contributes to the instability of the levee during construction operations.

FORTY-EIGHT: The permittee shall be responsible for all damages due to settlement, consolidation, or heave from any construction-induced activities.

FORTY-NINE: All fencing, gates and signs removed during construction of this project shall be replaced in kind and at the original locations. If it is necessary to relocate any fence, gate or sign, the permittee is required to obtain written approval from the Board prior to installation at a new location if not shown on the ~~submitted~~ approved drawings.

FIFTY: (Superseded by Special Condition NINETY-EIGHT) ~~Any pipe or conduit being reinstalled by permittee in the levee section or within fifteen (15) feet and thirty (30) feet of the waterward and landward levee toes, respectively, shall meet CCR 23 standards or have a Board variance approval per CCR 23 Sections 11(a) and (b). Board Staff Report Attachment K describes these variances and is attached to this permit as Exhibit D and is incorporated by reference.~~

FIFTY-ONE: Fill on the levee slopes shall be keyed into the existing levee section with each lift or as specified in the approved contract plans and specifications.

FIFTY-TWO: The fill surface areas shall be graded to direct drainage away from the toe of the levee.

FIFTY-THREE: Some existing levee slopes are less than 2 horizontal to 1 vertical on the land side, or less than 3 horizontal to 1 vertical on the water side, and will remain so after the work permitted herein. This permit approves these steeper slopes by a variance to Board standards.

FIFTY-FOUR: A pipeline or conduit to be filled with concrete must have a minimum cover of (3) three feet below the waterward levee slope and (1) foot below the landward levee slope.

CONSTRUCTION MATERIALS

FIFTY-FIVE: (Superseded by Special Condition NINETY-NINE) ~~All fill material shall be as stated in the Project Area C contract specifications Division 31 - Earthwork (amended, September 27, 2013) and free of lumps or stones exceeding 8 inches in greatest dimension, vegetative matter, or other unsatisfactory~~

~~material.~~

FIFTY-SIX: Backfill material for excavations within the existing and to be constructed levee sections and within fifty (50) feet of the levee toes shall be placed in 12-inch layers, moisture conditioned ranging from 3 above to 1 below optimum moisture content, and compacted to a minimum of 95 percent relative compaction as measured by ASTM Method D698, or as provided for in the approved contract specifications ~~Division 31 - Earthwork, and utilizing a method specification~~ (refer to Special Conditions EIGHTY SIX and EIGHTY SEVEN) for newly defined Type-3 soils within the levee prism and imported top soil.

FIFTY-SEVEN: Earthen material meeting the requirements designated in this permit and included Project Area C or gap closure specifications shall be used when constructing or reconstructing the waterside levee slope and levee crown fill areas, and no cuts shall remain in the levee section upon completion.

FIFTY-EIGHT: (Superseded by Special Condition ONE-HUNDRED) ~~Fill material shall be placed only within the area indicated in the 100% "Issued For Bid" approved plans and specifications including Addenda Nos. 1, 2, 3, and Exhibit A5 to this permit. Placement of additional fill in excess of 500 cubic yards beyond what is specified in these plans shall require written authorization from the Board's Chief Engineer.~~

FIFTY-NINE: Density tests by a certified materials laboratory will be required to verify compaction of backfill within the levee section and within fifty (50) feet of the levee toes. A method specification will be utilized in Type-3 zone fills for the upper waterside surficial zone and the imported topsoil layer to be placed on the upper landside slope.

SIXTY: The reconstructed levee crown roadway and access ramps shall be surfaced with a minimum of 4 inches of compacted, Class 2, aggregate base (Caltrans Specification 26-1.02A).

SIXTY-ONE: Fluid pressures in the cutoff wall construction zone shall be monitored and controlled to minimize the potential for hydrofracturing.

SIXTY-TWO: Excess bentonite or other cutoff wall fluids shall be properly disposed of outside of the floodway. The bentonite or other cutoff wall fluids can be used as Type-1 or Type-2 backfill material for levee reconstruction if properly mixed within borrow or stockpile sites, and per the requirements within the contract specification for gradation, moisture and compaction.

SIXTY-THREE: Aggregate base material shall be compacted to a relative compaction of not less than 95 percent per ASTM Method D1557-91, with a moisture content sufficient to obtain the required compaction, or per the approved Project Area C or gap closure contract specifications ~~Division 32 - Exterior Improvements, Aggregate base course~~.

VEGETATION / ENVIRONMENTAL MITIGATION

SIXTY-FOUR: Cleared trees and brush shall be completely burned or removed from the floodway, and downed trees or brush shall not remain in the floodway during the flood season from November 1

to April 15.

SIXTY-FIVE: The permittee shall replant or re-seed the levee slopes to restore sod, grass, or other non-woody ground covers if damaged during project work.

SIXTY-SIX: The mitigation measures approved by the permittee and found in its Mitigation and Monitoring Reporting Program (MMRP) are made a condition of this permit. The permittee shall implement all such mitigation measures. The measures in the MMRP may be modified without triggering the need for subsequent or supplemental analysis under CEQA Guidelines section 15162(c). The permittee shall notify the Board's Environmental Section staff in advance of any proposed changes and shall submit supporting documentation for staff review and comment.

SIXTY-SEVEN: In the event existing revetment on the channel bank or levee slope is disturbed or displaced, it shall be restored to its original condition upon completion of the proposed installation.

SIXTY-EIGHT: In the event that levee or bank erosion injurious to facilities of the ~~State Plan of Flood Control~~SPFC occurs at or adjacent to and as a result of the permitted flood system improvement project or related encroachment work, the permittee shall repair the eroded area and propose measures, to be approved by the Board, to prevent further erosion.

CONSTRUCTION COMPLETION

SIXTY-NINE: All temporary fencing, gates and signs shall be removed upon completion of project.

SEVENTY: The project site including the levee section and access ramps shall be restored to at least the condition that existed prior to commencement of work.

SEVENTY-ONE: Upon completion of the project, the permittee shall perform a levee crown profile survey and create a photo record, including associated descriptions, of "as-built" levee conditions. The levee crown profile survey and photo record shall be certified (signed and stamped) by a licensed land surveyor or professional engineer registered in the State of California and submitted to the Board within 120 days of project completion.

SEVENTY-TWO: The permittee acknowledges that some portions of the levee improvements may be overbuilt to account for settlement. At least twelve (12) months after completion the permittee shall perform a third levee crown profile survey of the completed Project Area C and provide it and a comparison against the pre-construction levee crown profile. The permittee shall ensure that the final levee crown profile does not exceed the pre-construction profile, as this permit does not authorize any levee raises.

SEVENTY-THREE: When DWR releases the completed Central Valley Floodplain Evaluation and Delineation Program (CVFED) data the permittee will recalculate freeboard using only that data for both cross section and top of levee elevations. The permittee will develop a plan for Board approval to correct any freeboard deficiencies under this or a future phase of construction.

SEVENTY-FOUR: The potential for earthquake-induced levee damage and displacement along the

~~Feather River West Levee Project~~FRWLP will be incorporated into an Emergency Action Plan (EAP) in accordance with DWR Urban Levee Design Criteria (ULDC) requirements. The permittee shall submit the EAP to the Board staff for review and comment 180 days after completion of Project Area C construction.

SEVENTY-FIVE: Upon completion of the construction contract for Project Area C and the gaps closures the permittee will conduct a Final Construction Walk-through for Board, Department of Water Resources, and U.S. Army Corps of Engineers staff. The walk-through is a condition for Board project acceptance, State funding, and as predecessor to U.S. Army Corps of Engineers system wide acceptance and eligibility for Public Law 84-99 rehabilitation and inspection program. This walk-through is critical to successful permit and project close-out.

POST-CONSTRUCTION

SEVENTY-SIX: Within 120 days of completion of the project, the permittee shall submit to the Board a certification report, stamped and signed by a professional civil engineer registered in the State of California, certifying the work was performed and inspected in accordance with Board permit conditions and the permittee's submitted drawings and specifications, addenda and contract change orders.

SEVENTY-SEVEN: Within three years from completion of the construction of the work authorized under this permit, the permittee shall provide the Sacramento and San Joaquin Drainage District, acting by and through the Board, a permanent easement or joint use agreement granting all flood control rights upon, over and across the property to be occupied by the existing or to-be-reconstructed levee, including the area of the cutoff wall and levee raise and realignment fill areas. The easement must include the levee section, the area ten (10) feet from the waterward levee toe adjacent to waterside berms which may be used for staging flood protection activities, and the area thirty (30) feet in width adjacent to the existing landward levee toe if the area is not presently encumbered by a Board easement. For information regarding Board easements please contact Angelica Aguilar at (916) 653-5782.

SEVENTY-EIGHT: If the project, or any portion thereof, is to be abandoned in the future, the permittee or successor(s) shall abandon the project under direction of the Board and ~~Department of Water Resources~~DWR, at the permittee's or successor's cost and expense.

OPERATIONS AND MAINTENANCE

SEVENTY-NINE: The permittee shall maintain the permitted project works in the manner required and as requested by the authorized representative of the ~~Department of Water Resources~~DWR~~,~~ Maintenance Area 16, Levee District Nos. 1 and 9 (Sutter County), or any other agency responsible for maintenance while under contract to do so.

EIGHTY: Haul ramps and utilized levee crown roadway shall be maintained during construction in a manner prescribed by authorized representatives of the Board, ~~Department of Water Resources~~DWR, ~~Levee District~~ or any other agency responsible for maintenance.

EIGHTY-ONE: Within 180 days of completion of the project, the permittee shall submit to the Board proposed revisions to ~~the U. S. Army Corps of Engineers~~USACE, Supplement to Standard Operation and Maintenance Manual, Sacramento River Flood Control Project, and the associated "as-built" drawings for system alterations approved by Exhibits A~~1~~ through ~~A5~~C that are to be incorporated into the federal ~~Sacramento River Flood Control Project~~SRFCP.

EIGHTY-TWO: The improvements permitted herein are designed to manage flows from a storm with a probability of occurrence of .005 in any year (200-year protection). Permittee's design assumed that non-urban existing upstream levees will not be raised above the design for the ~~Sacramento River Flood Control Project~~SRFCP as shown on the 1957 profile. Permittee's design flow and calculations assumed no upstream levee overtopping where permittee's design storm water surface elevation exceeds the 1957 profile top of levee elevation. Permittee acknowledges that the adopted 2012 Central Valley Flood Protection Plan (CVFPP) will be regularly updated by the State and that the plan and future updates could include improvements that would change the flow and water surface elevation associated with permittee's design storm, possibly reducing the level of protection provided by the permitted improvements. Permittee agrees to participate in future modifications to these levees as may be required by the ~~Central Valley Flood Protection Plan~~CVFPP and its subsequent updates. Permittee's level of participation shall be equivalent to the level required of other local jurisdictions by the ~~Plan~~CVFPP. Permittee further agrees that should the ~~Plan~~ CVFPP include measures that reduce the level of protection provided by the permitted improvements, permittee shall have no basis for a claim of hydraulic impacts.

EIGHTY-THREE: The Sutter Butte Main Canal District (SBMCD) is in close proximity to the federal levee and in some cases the east bank of the canal and the landside of the Feather River west levee are one and the same. ~~The Sutter Butte Flood Control Agency~~SBFCA has agreed to help coordinate and develop an agreement between ~~the Department of Water Resources~~DWR (Maintenance Area 16), levee districts(s), and SBMCD regarding the distinction and separation of maintenance responsibilities between the LMAs and SBMCD prior to the Board's acceptance of the ~~Feather River West Levee Project~~FRWLP Area C. The Board shall have up to 30 days after receipt of the agreement for comment. The Board and / or ~~the Department of Water Resources~~DWR may extend this review period up to 45 days by written notification.

ADDITIONAL CONDITIONS FOR APPROVAL TO CONSTRUCT PROJECT AREA C (2013)

EIGHTY-FOUR: Construction Drawing No. C-102, Note-6 indicates the removal and replacement of existing cobble rip-rap from the waterside levee slope from Stations 850+00 to 855+60. The replaced cobble rip-rap shall meet current ~~CCR~~ California Code of Regulations, Title 23, Division 1, Article 8 (Title 23 Standards) requirements of Section 121(a),(1),(6),(12), and Figure 8.02 of that section. The code specifically requires a bedding material under the rip-rap, a 15-inch graded cobblestone gradation, a minimum 18-inch revetment thickness, and a toe key trench.

EIGHTY-FIVE: Potholing will be required in Project Area C, Reaches 14 to 24, to determine whether the proposed levee degrade material meets current specifications. Potholes shall be performed perpendicular to the levee centerline at a minimal spacing of 2,500 LF. If the investigation results reveal deviations in soil materials from the current specifications, the permittee shall notify the Board in writing, shall describe the nature and extent of the deviations, and shall propose a detailed solution and path forward for Board consideration.

EIGHTY-SIX: Pursuant to USACE approval dated October 2, 2013 (attached to this permit as Exhibit A5I and incorporated by reference,) to deviate from the final plans and specifications due to changes in field conditions during construction, this approval includes revisions to Special Conditions FIFTY FIVE, FIFTY SIX, AND FIFTY NINE.

EIGHTY-SEVEN: This permit now allows for a method specification to be utilized for placement of Type-3 soils in the upper waterside surficial zone and the imported topsoil. To achieve desired relative density of levee backfill under the method specification the permittee shall make three passes with selected compaction equipment at specified speed and moisture content. The imported top soil will only require two passes.

EIGHTY-EIGHT: Placement of reconstructed levee fill shall be limited to the existing levee footprint and shall be done so as to not result in unstable outer levee slopes. All excess soil materials shall be hauled off site.

EIGHTY-NINE: All cobbles greater than eight (8) inches in size shall be utilized in approved waterside slope protection areas or hauled off site.

NINETY: Removed (by strikeout) for redundancy with attached Exhibit A. Pursuant to Exhibit A3, USACE Letter of Permission, September 19, 2013, Special Condition "d", the permittee shall, if any cultural artifact or an unusal amount of bone, shell, or nonnative stone is uncovered during construction, halt work in that area so that a professionally qualified archaeologist approved by the USACE can determine the significance of the find. If human bone is uncovered the coroner and California Native American Heritage Commission shall be contacted immediately. Refer to Exhibit A3 for complete requirements.

NINETY-ONE: Removed (by strikeout) for redundancy with attached Exhibit A. Pursuant to Exhibit A3, USACE Letter of Permission, September 19, 2013, Special Condition "m", the permittee shall develop and submit a Floodplain Mangement Plan by September 19, 2014. Refer to Exhibit A3 for complete requirements.

NINETY-TWO: Removed (by strikeout) for redundancy with attached Exhibit A. Pursuant to Exhibit A3, USACE Letter of Permission, September 19, 2013, "Further Information, paragraph c", page 3, the USACE may reevaluate its decision to approve the work permitted herein at any time the circumstances warrant. Should field conditions or future investigations require a deviation from the Final Plans, this deviation must be approved by the USACE through a request from the Board. Refer to Exhibit A3 for complete requirements.

NINETY-THREE: Removed (by strikeout) for redundancy with attached Exhibit B. Pursuant to Exhibit A4, USACE Record of Decision, September 13, 2013, Item III, Section B "Mitigation for Significant Effects", the permittee shall abide by all terms and conditions, and shall ensure that all conservation measures and long-term management and maintenance are implemented in perpetuity. Refer to Exhibt A4 for complete requirements.

NINETY-FOUR: The permittee shall develop a Stormwater Water Pollution and Prevention Plan and shall make a copy readily available for review at the project site during construction.

GAP CLOSURES

NINETY-FIVE: This Special Condition shall supersede Special Conditions THIRTEEN and TWENTY-ONE. This permit conditions construction of the FRWL, Project Area C (Reaches 13 through 24). The permittee shall comply with all conditions set forth in the U.S. Army Corps of Engineers (USACE) Letter of Permission from the Sacramento District dated June XX, 2016 that supersedes those previously issued on July 22, 2013 and September 19, 2013; the USACE Washington D.C. Headquarters Record of Decision (ROD) dated September 13, 2013 (Project Area C, excluding Reach 13); and the USACE ROD dated July 19, 2013 (Project Area C, Reach 13 only); which are attached to this permit as Exhibits A, B and C, respectively, and incorporated by reference.

NINETY-SIX: This Special Condition shall supersede Special Conditions TWENTY-TWO and TWENTY-THREE. The permittee shall comply with all conditions set forth in the endorsements for DWR Maintenance Area 16 dated May 16, 2013, Levee District 1 dated April 16, 2013 and April 16, 2016, and Levee District 9 dated April 16, 2013 and May 19, 2015, which are attached to this permit as Exhibits D, E, and F, respectively.

NINETY-SEVEN: This Special Condition shall supersede a portion of Special Condition THIRTY-THREE and all of Special Condition THIRTY-SEVEN. All work approved by this permit shall be in accordance with the approved drawings and specifications, except as modified by Special Conditions herein. Project Area C includes construction variances to Title 23 Standards pursuant to California Code of Regulations Title 23, Division 1 (Title 23), Sections 11(a) and 11(b). The construction variances approved at the May 24, 2013 Board meeting include those described in Exhibit G and incorporated by reference. In addition to the previously approved construction variances, the gap closure work approved at the May 20, 2016 Board meeting is described in the Exhibit H and incorporated by reference.

NINETY-EIGHT: This Special Condition shall supersede Special Condition FIFTY. Any pipe, conduit, or other construction within the project right of way shall meet Title 23 Standards, have an approved construction variance per Title 23, Sections 11(a) and (b), or be included in either Exhibit G or H of this permit.

NINETY-NINE: This Special Condition shall supersede Special Condition FIFTY-FIVE. All fill material shall be as stated in the approved Project Area C or gap closure contract specifications and free from lumps or stones exceeding eight (8) inches in its greatest dimension, vegetative matter, or other unsatisfactory material, with the exception of materials and locations approved under Board variance per Title 23, Sections 11(a) and (b).

ONE-HUNDRED: This Special Condition shall supersede Special Condition FIFTY-EIGHT. Fill material shall be placed only within the areas indicated in the approved plans or specifications, with the exception of approved construction variances per Title 23, Sections 11(a) and (b). Placement of additional fill in excess of 500 cubic yards beyond what is specified in the approved plans or specifications shall require written authorization from the Board's Chief Engineer.

ONE-HUNDRED-ONE: Permittee shall pay to the Board, an inspection fee to cover inspection cost(s),

including staff and/or consultant time and expenses, for any inspections before, during, post-construction, and regularly thereafter as deemed necessary by the Board.

ONE-HUNDRED-TWO: This permit shall supersede previously issued versions of Permit No. 18793-1 issued on July 23, 2013 and October 4, 2013.

END OF CONDITIONS

ATTACHMENT B – Exhibit A: USACE LOP

This letter has not yet been received by Board staff; however, it is expected to arrive in early June 2016

DEPARTMENT OF THE ARMY
U. S. ARMY CORPS OF ENGINEERS
441 G STREET, NW
WASHINGTON, DC 20314-1000

JUL 19 2013

CECW-SPD

MEMORANDUM FOR Commander, COL C. David Turner, South Pacific Division, 1455 (ATTN: Clark Frentzen, CESPD-PDS-P) Market Street, San Francisco, California 94103-1398

SUBJECT: Record of Decision – Feather River West Levee Project (FRWLP), Reach 13 Contract C (Shanghai Bend), Sutter and Butte counties, California

1. References:

a. Memorandum, CESPK-CO-OR, 16 July 2013, subject: Draft Record of Decision (ROD) for Section 408 Approval of a Flood Risk Reduction Project Alteration: Feather River West Levee Project (Sutter 408), Sutter & Butte Counties, California (Enclosure 2).

b. Memorandum, CESPD-PDC, 17 July 2013, subject: Request for Section 408 Approval of a Flood Risk Reduction Project Alteration: Feather River West Levee Project (Sutter 408), Sutter and Butte Counties, California (Enclosure 3).

2. The Record of Decision (ROD) for subject project was signed by the approving official on 19 July 2013 (Enclosure 1).

3. The comments received during the Environmental Impact Statement (EIS) public review period did not require any changes to the Shanghai Bend portion of the project.

4. The Feather River West Levee Project (FRWLP) is a flood risk management project, proposed by the Central Valley Flood Protection Board (CVFPB) and to be constructed by the Sutter Butte Flood Control Agency (SBFCA). The ROD covers Reach 13 of Contract C, consisting solely of cutoff walls for approximately 2 miles of the FRWLP, to be constructed in 2013. If and when it would be appropriate, an additional ROD will be prepared for the remaining reaches of the FRWLP, which consists of an additional 12 reaches for Contract C and various reaches for Contracts A, B, and D.

5. In order to ensure that the proposed action does not impair the usefulness of the existing Federal project and that it will not be injurious to the public interest, the following conditions shall be imposed:

a. 33 U.S.C. §408 approval is conditional on compliance with all of the mandatory terms and conditions, as well as conservation measures, in the BO (incorporated herein by reference). Failure to comply with these terms and conditions, and conservation measures associated with the incidental take statement in the BO, where the take of a listed species occurs, would constitute an unauthorized take and noncompliance with USACE's approval to proceed. The

USFWS is the appropriate authority to determine compliance with the terms and conditions, as well as conservation measures, of the USFWS BO and with the ESA.

b. The SBFCA is required to submit revisions to the Operations and Maintenance (O&M) Manuals for review and approval by the USACE, Sacramento District, within 180 days of construction completion. As-built drawings and permanent maintenance easement boundaries must be submitted in conjunction with the draft O&M manual. Upon receipt of the draft O&M manual, this office will schedule a transfer inspection with CVFPB to verify that all construction has been completed in accordance with the permission. Any features found to be deficient during that inspection will require CVFPB's correction prior to USACE accepting the alterations as part of the Federal project. Within 180 days of construction completion, CVFPB must furnish a certification report that the work has been completed in accordance with the conditions of this permission.

c. To ensure that there is mitigation for residual flood risk, CVFPB and SBFCA are required to update the Floodplain Management Plan that includes proactive elements for flood information dissemination, public awareness, notification and training, flood warning and evacuation plans, emergency flood operations plan with annual exercise, dedicated evacuation resources, and post-flood recovery plans. In accordance with items of local cooperation, this plan must be submitted within 1 year of the issuance of the 33 U.S.C. §408 letter of permission for Reach 13 Contract C. The CVFPB and SBFCA are required to participate in and comply with applicable Federal flood plain management and flood insurance programs.

6. My point of contact for this project is Bradd Schwichtenberg, Civil Deputy, South Pacific Division Regional Integration Team, (202) 761-1367.

Encls

STEVEN L. STOCKTON, P.E.
Director of Civil Works

CF:
CECW
CECW-SPD

RECORD OF DECISION
33 U.S.C. SECTION 408 PERMISSION FOR REACH 13 OF CONTRACT C OF THE FEATHER RIVER WEST LEVEE PROJECT SUTTER AND BUTTE COUNTIES, CA

The Feather River West Levee Project (FRWLP) is a flood risk management project, proposed by the Central Valley Flood Protection Board (CVFPB) and to be constructed by the Sutter Butte Flood Control Agency (SBFCA). I have considered the District and Division Commander recommendations on the Final Environmental Impact Statement (FEIS), dated June 2013. This Record of Decision (ROD) covers Reach 13 of Contract C, consisting solely of cutoff walls for approximately 2 miles of the FRWLP, to be constructed in 2013. If and when it would be appropriate, an additional ROD will be prepared for the remaining reaches of the FRWLP, which consists of an additional 12 reaches for Contract C and various reaches for Contracts A, B, and D.

Because the FRWLP consists of proposed modifications to the west levee of the Feather River, a feature of the Sacramento River Flood Control Project (SRFCP) authorized by Congress under the Flood Control Act of March 1917, the CVFPB must seek permission by the US Army Corps of Engineers (Corps) pursuant to 33 U.S.C §408. The Assistant Secretary of the Army (Civil Works) has delegated approval authority to the U.S. Army Corps of Engineers' Chief of Engineers, who further delegated approval authority to the Director of Civil Works, to issue permission to proceed with the proposed construction pursuant to 33 U.S.C. §408 based on my finding that the proposed alteration is not injurious to the public interest and would not impair the usefulness of the SRFCP.

Based on this review and the views of other interested agencies and the public, I find that the selected plan for Reach 13 of Contract C of the FRWLP as presented in the FEIS (Notice of Availability for final EIS was published in the *Federal Register* on June 14, 2013) is based on life safety requirements, is considered cost effective, is technically sound, is in accordance with environmental statutes, and is in the public interest. The benefits to be gained from implementing the selected plan outweigh any known adverse effects. Thus, pursuant to 33 U.S.C. §408, I approve the request by the CVFPB and the SBFCA to modify the SRFCP as described below.

I. Background

The purpose of the FRWLP is to improve the flood risk management capability of the levee system in the project area. The FRWLP specifically focuses on seepage, slope stability, and erosion along the 41 miles of levee of the SRFCP. The overall FRWLP comprises work to be implemented under four contracts (A, B, C, and D). Reach 13 of Contract C is an approximate 2-mile reach and is the reach of highest priority due to past performance concerns. This problematic location is the site of multiple breaches and has been repeatedly repaired and modified over the years. Currently, through-seepage and under-seepage deficiencies remain, which contribute to a heightened, intolerable level of flood risk. The proposed modifications will address a longer-term remediation to these known deficiencies.

To initiate the process to seek Corps permission for the entire FRWLP, a letter from the CVFPB requesting 33 U.S.C. §408 permission was received on November 2, 2012. The Corps' authority to grant permission for the FRWLP under 33 U.S.C. §408 triggers the Corps' requirement to comply with the National Environmental Policy Act (NEPA). The EIS was developed to fully evaluate the impacts of the proposed work. The Feather River levees have been evaluated in previous environmental documents for the SRFCP, including the 1992 SRFCP Systems Evaluation EIS. Currently, the Corps is conducting a related Sutter Basin Pilot Feasibility Study (SBPFS). The FRWLP is being advanced by SBFCA to expeditiously reduce flood risk before the Sutter Basin feasibility study is completed. The Corps released an integrated Sutter Basin Draft Pilot Feasibility Report and Draft EIR/Draft Supplemental EIS (DEIR/SEIS) for public review in June 2013. The DEIR/SEIS for the SBPFS tiers from, and was released concurrently with release of, the FEIS for the FRWLP in June 2013.

This ROD considers Reach 13 of Contract C of the FRWLP (stations 844+50 to 927+00, equal to 8,250 feet in length) pursuant to the Corps' authority under 33 U.S.C. §408. The specific flood risk management features of Reach 13 are summarized below and detailed in Table 2-4 of the FEIS:

- **Contract C, Reach 13:** The work consists of constructing a cutoff wall between station 844+50 and 923+75 up to approximately 30' deep along the centerline of the levee. The levee would be degraded by approximately 50% of its overall height in order to install the cutoff wall (full degrade from station 844+50 to station 897+50) and rebuilt to original line and grade. Work will also include filling low spots where necessary.

II. Alternatives Considered

The No Action Alternative was compared to three different alternative measures and their environmental effects. Each alternative was developed to address seepage related deficiencies and is summarized below. All alternatives for Reach 13 have similar environmental effects, which can be found in the FEIS, dated June 2013. Alternative 3 will be implemented, and that is the environmentally preferable alternative.

Alternative 1 – 33 foot deep cutoff wall between stations 845+00 to 857+00; 28 foot deep cutoff wall between stations 857+00 to 927+00.

Alternative 2 – Shallow cutoff wall to 35 foot deep between stations 845+00 to 927+00 with relief wells at 200 foot spacing and 65 feet deep.

Alternative 3 – 30 foot deep cutoff wall between station 844+50 to 923+75.

III. Consideration of Mitigation Measures

Although all practicable means to avoid, minimize, and compensate for adverse effects on environmental resources have been incorporated into the FRWLP, the proposed action would have several unavoidable significant effects. Mitigation for these and for other adverse effects is

incorporated into the project. The Mitigation and Monitoring Plan will guide the SBFCA in the mitigation requirements for project effects to fish and wildlife habitat, including endangered species.

A. Significant and Unavoidable Effects. Due to the large volume of haul traffic and the operation of a wide range of construction equipment, short-term emissions of reactive organic gases during construction of the entire FRWLP would result in significant and unavoidable air quality effects in the Feather River Air Quality Management District (FRAQMD) covering Sutter County. This would apply to construction emissions for Reach 13. Implementation of mitigation measures would greatly reduce project-generated construction emissions, but would not reduce all emissions to below FRAQMD thresholds. To compensate for any emissions above air quality thresholds the SBFCA has agreed to provide payment into the applicable air quality mitigation fee program.

During some time periods, short-term noise and vibrations affecting residents along the FRWLP would be significant and unavoidable. This is especially true for construction in reaches immediately adjacent to Yuba City, including Reach 13.

Consultation with the SHPO and Native American Tribes, in accordance with Section 106 of the NHPA, has led to the determination that a number of potentially significant cultural resources could be affected by project activities. The Corps, SBFCA, and the SHPO are all parties to a programmatic agreement (PA), signed 1 July 2013. Pursuant to the PA and prior to construction, surveys would be conducted and Historic Properties Treatment Plans would be prepared by the Corps and SBFCA, in consultation with the SHPO and Native American Tribes, to resolve adverse effects to historic properties. The treatment plans would include mitigation measures that are consistent with those proposed in the FEIS. For Reach 13 specifically, additional work to identify and evaluate significant cultural resources and resolve any potential adverse effects to such resources is being undertaken pursuant to the PA. Following the requirements of the PA, construction shall not begin on any reach, contract, or phase of the project until the consultation process is complete.

B. Mitigation for Significant Effects. The USFWS Biological Opinion (BO) for the FRWLP included 4 terms and conditions and 16 conservation measures. SBFCA will implement all terms and conditions and conservation measures. The FRWLP and Reach 13 includes mitigation for effects to the threatened valley elderberry longhorn beetle (VELB) and the threatened giant garter snake (GGS) and their habitats. Compensatory mitigation for project effects on VELB includes planting of vegetation and protection of habitats that would support the species. Construction in Reach 13 would require compensation for the loss of 1 elderberry plant and would require protection measures for 16 other plants. Since transplanting would be outside of the normal transplanting window, the higher planting requirements specified in the BO would apply. Proposed compensatory mitigation for project effects to GGS would include pre-construction surveys, fencing, time of year restrictions, protection of agricultural areas that serve as GGS habitat, and purchase of credits at a compensation bank. Construction in Reach 13 would have potential impacts to upland habitat for GGS along the levee.

The Mitigation and Monitoring Plan will guide the SBFCA and the CVFPB as they manage the compensatory land in perpetuity. The plan establishes specific success criteria for the habitat components, specifies contingency measures to be undertaken if success criteria are not met, and describes short-term and long-term management and maintenance of the mitigation lands.

The National Marine Fisheries Service (NMFS) provided the Corps with a letter of concurrence with the Corps' determination of "not likely to adversely affect", which contains terms and conditions and requires applicable Conservation Measures. SBFCA will implement these terms and conditions and other measures.

The USFWS Coordination Act Report (CAR) for the FRWLP was issued on May 18, 2013. The CAR contained 7 (of 10 total) recommendations applicable for the FRWLP, including Reach 13. SBFCA will implement these recommendations. The other three CAR recommendations applied solely to the SBFPS.

The FRWLP includes designs to compensate for the loss of riparian vegetation and other long-term effects to vegetation on the waterside of the Feather River west levee slope. The work in Reach 13 would require the removal of only one tree. A bentonite slurry spill contingency plan (BSSCP) would be developed and included in the Stormwater Water Pollution and Prevention Plan (SWPPP) or slurry work plan developed prior to construction by the construction contractor.

Prior to initiation of each construction season, a qualified biologist will be required to conduct surveys in and near the work areas to determine the presence of any active migratory bird nests. If no nests are found, then construction may proceed. If active nests are found, then SBFCA would coordinate with the USFWS to determine appropriate buffer areas or other measures to avoid disturbing the nests until the young have fledged. When possible, construction would be conducted during the non-breeding season for migratory birds.

The work proposed in Reach 13 of the FRWLP is expected to have a potentially significant effect on groundwater and surface water quality from contact with the water table. However, these water quality effects will be minimized through the development and implementation of the: BSSCP; SWPPP; and a spill, prevention, control, and counter measure plan.

The work proposed in Reach 13 of the FRWLP would also have a potentially significant effect on the alteration of existing drainage patterns in the area. However, these geomorphic and flood risk management effects would be mitigated by coordinating the work with the owners and operators of the local drainage systems and affected landowners, preparing any needed drainage studies, and remediating effects through final project design.

C. Mitigation for Less than Significant Effects. The entire FRWLP including Reach 13 work would have less-than-significant effects on other resources including traffic, fisheries, agriculture and land use, recreation, soils, climate change and greenhouse gases, and visual resources.

IV. Conclusion

This ROD completes the NEPA process for Reach 13 of Contract C of the FRWLP.

PERMISSION UNDER 33 U.S.C. §408

Based on my consideration of the District and Division Commander recommendations on the 33 U.S.C. §408 package, the FEIS, the views of the Federal, State, regional, and local agencies, and input from the public, I find the recommended Reach 13 of Contract C of the FRWLP to be technically adequate and not an impairment to the usefulness of the existing Federal project; to be in accordance with environmental statutes; and not to be injurious to the public interest. Therefore, pursuant to my delegated authority under 33 U.S.C. §408, the request for alteration of the Sacramento River Flood Control Project, Reach 13 of Contact C of the Feather River West Levee Project, is approved. I hereby grant permission to the CVFPB to allow SBFCA to construct Reach 13 of Contract C of the FRWLP and to alter the Federal project.

19 JULY 2013
Date

Steven L. Stockton, P.E.
Director of Civil Works

UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
Southwest Region
501 West Ocean Boulevard, Suite 4200
Long Beach, California 90802-4213

In response refer to:
2013/9542

Alicia E. Kirchner
Chief, Planning Division
Department of Army
U.S. Army Corps of Engineers
1325 J Street
Sacramento, California 95814-2833

Dear Ms. Kirchner:

This letter is in response to your March 22, 2013, request for initiation of section 7 consultation with NOAA's National Marine Fisheries Service (NMFS) pursuant to the Endangered Species Act (ESA) of 1973, as amended (16 U.S.C. 1531 *et seq.*), concerning the Feather River West Levee Project (FRWLP). The proposed project includes modifying approximately 41 miles of a U.S. Army Corps of Engineers (Corps) levee to reduce the potential for flooding, flood damage, and public risk in the Yuba City area. The proposed project is currently scheduled to be constructed by the Sutter Butte Flood Control Agency (SBFCA), in five construction seasons from 2013 to 2017. To construct the FRWLP, SBFCA is requesting permission from the Corps pursuant to Section 14 of the Rivers and Harbors Act of 1899 (Title 33 of the U.S. Government Code [USC], Section 408, [33 USC 408]), for the alteration of a levee as part of the Sacramento River Flood Control Project.

The Corps has determined that the proposed project may affect, but is not likely to adversely affect federally listed as threatened Central Valley (CV) spring-run Chinook salmon (*Oncorhynchus tshawytscha)* evolutionarily significant unit (ESU), endangered Sacramento River winter-run Chinook salmon (*O. tshawytscha)* ESU, threatened California CV (CCV) steelhead (*O. mykiss*) distinct population segment (DPS), threatened Southern DPS of North American green sturgeon (*Acipenser medirostris*), and their designated critical habitats. In addition, the Corps has determined that the proposed project will not adversely affect essential fish habitat (EFH) of Pacific salmon and thus fulfills section 305 (b)(2) of the Magnuson – Stevens Fishery Conservation and Management Act (Magnuson-Stevens Act). This letter also serves as consultation under the authority of, and in accordance with, the provisions of the Fish and Wildlife Coordination Act of 1934 (FWCA), as amended.

Consultation to Date

The following is a summary of the NMFS consultation activities on the proposed project:

(1) On December 28, 2012, SBFCA submitted a letter to NMFS via email to request technical assistance regarding potential effects of the proposed project on listed fish species and their designated critical habitat, identify additional data needs, and determine needs for consultation. The letter included a summary of waterside riparian impacts and a map of the project footprint in relation to the ordinary high water mark (OHWM).

(2) On February 5, 2013, the Corps and SBFCA held a meeting with Michael Hendrick of NMFS to provide an overview of the proposed project and discuss proposed project effects on ESA-listed fish species, proposed conservation measures, consultation requirements, and schedule.

(3) In response to the SBFCA's December 28, 2012, letter, NMFS provided a list of federally listed fish species that could occur in the proposed project area and designated critical habitat occurring in the proposed project area (letter to SBFCA dated March 4, 2013).

Project Description

SBFCA is proposing the FRWLP to reduce flood risk in the Sutter Basin, which includes portions of Sutter and Butte counties in California's Sacramento Valley. Communities in the basin include Yuba City, Biggs, Gridley, Live Oak, and Sutter. Floodwaters that potentially threaten the basin originate from the Feather River watershed or the upper Sacramento River watershed.

The FRWLP will reduce flood risk in the Sutter Basin by addressing known levee deficiencies along the Feather River West Levee from Thermalito Afterbay downstream to a point approximately 4 miles upstream of the Feather River's confluence with the Sutter Bypass. The proposed project includes modifying approximately 41 miles of a Corps levee to reduce the potential for flooding, flood damage, and public risk in the Yuba City area. The levee modification will involve: (1) installing approximately 34 miles of soil and bentonite cutoff walls into the levee core, (2) constructing 0.72 miles of seepage berms on the landside of the levee, (3) placing 0.42 miles of ditch fill, (4) dredging 1.8 miles of canal, and (5) relocating or removing encroachments along approximately 3.44 miles of the Feather River west levee. When completed, the work will reduce levee deficiencies, including through- and under-seepage, slope stability, erosion, and encroachments, within the construction footprint. Materials imported to the construction site will include water, bentonite, cement, incidental construction support materials, aggregate base rock, hydroseed, and up to 1,500,000 cubic yards of embankment fill material. While the specific sequencing of construction will be dynamic throughout the planning and design of the FRWLP, the construction will occur from 2013 to 2017.

Action Area

The regulations governing consultations under the ESA define *action area* as "all areas to be affected directly or indirectly by the Federal action and not merely the immediate area involved in the action" (51 FR 19957). The action area should be determined based on all direct and indirect effects of the proposed action (50 CFR 402.02 and 402.14(b)(2)).

The proposed action area consists of the 41-mile corridor along the west levee of the Feather River from the Thermalito Afterbay to approximately 4 miles north of the Sutter Bypass. The proposed action area includes the project construction area and a 100-foot buffer around this area. The proposed construction area is defined as the area in which levee improvements (seepage berms, stability berms, relief wells, and slurry cutoff walls) are likely to be constructed. All of the potential direct and indirect effects will occur within this area and the 100-foot buffer around this area.

The proposed action area also includes six potential borrow sites that could supply the borrow material necessary for levee construction and upgrades, and routes from the project construction area to the borrow sites. The proposed action area also includes the existing 48.5-acre Star Bend Conservation Area, located within the setback area adjacent to the west levee of the Feather River, approximately 6 miles south of Yuba City.

Effects of Proposed Action

All federally listed fish species potentially found in the area of the proposed project, the CV spring-run Chinook salmon ESU, CCV steelhead DPS, and Southern DPS of North American green sturgeon, have life histories, biological and habitat requirements that may be impacted by the proposed project. The Sacramento River winter-run Chinook salmon ESU is not found within the proposed project's action area; therefore there will be no impacts.

The proposed action area of the FRWLP provides migratory habitat for adult CV spring-run Chinook salmon, and migratory and rearing habitat for juveniles. Based on observations in the Feather River, adults are likely to be present in the proposed action area between February and July as they migrate to summer holding habitat. The proposed action area of the FRWLP borders the designated critical habitat of CV spring-run Chinook salmon in the Feather River. Primary constituent elements (PCEs) of critical habitat in the adjacent reaches of the Feather River include: (1) freshwater rearing sites that have adequate water quality and quantity, floodplain connectivity, and natural cover that supports juvenile growth and mobility, and (2) freshwater migration corridors that support adequate water quantity and quality as well as natural cover to provide food and migration pathways for juveniles as well as adults. Critical habitat includes the river channel and lateral extent as defined by the ordinary high water line. In areas where the ordinary high water line has not been defined, the lateral extent is defined by the bankfull elevation or the elevation at which water begins to leave the channel and move on to the floodplain (this generally corresponds to a discharge that generally has a recurrence interval of one to two years on the annual flood series) (70 FR 52488).

The proposed action area of the FRWLP provides migratory habitat for adult steelhead, and migratory and rearing habitat for juveniles. Adult steelhead immigration in the Feather River occurs from September through March (SWRI 2003). The proposed action area of the FRWLP borders the designated critical habitat of CV steelhead in the Feather River, which includes the river channel and lateral extent as defined by the ordinary high water line. The PCEs of critical habitat are as described for spring-run Chinook salmon.

The proposed action area provides migratory and foraging habitat and likely spawning habitat for green sturgeon (Beamesderfer et al. 2004; Seesholtz pers. comm.). Historical sightings of adult green sturgeon in the Feather River have been in the spring during the general period of upstream migration in the Sacramento River. The proposed action area of the FRWLP borders designated critical habitat of the Southern DPS of North American green sturgeon, which includes the Feather River upstream to Oroville Dam.

Freshwater PCEs for the Southern DPS of North American green sturgeon include sufficient food resources for juvenile foraging, growth, and development; suitable substrates for egg incubation and development; suitable water quantity and quality for normal behavior, growth, and survival of all life stages; suitable passage conditions for adults, larvae, and juveniles; suitable holding pools and water depths for adults; and sediments free of elevated levels of contaminants capable of adversely affecting green sturgeon (74 FR 52300).

The Corps has determined that there will be no direct effect on the designated critical habitat for federally listed fish species, because all work on the waterside slope will stay above the OHWM and at least 50 feet from the top of the bank of the Feather River. All vegetation loss will be confined to the construction footprint, and there will be no additional removal of vegetation to comply with the Corps vegetation policies. As a result, there will be no modification of riparian vegetation or shaded riverine aquatic cover within designated critical habitat of federally listed fish species.

Direct effect to riparian vegetation will be limited to approximately 27 acres of riparian forest and scrub-shrub above the OHWM. Approximately 135 trees (mixed native and non-native riparian and orchard tress) will be removed from the waterside levee slope and toe. In addition, approximately 27 acres of orchard trees (344 trees) will be removed from the permanent and temporary footprints adjacent to the waterside levee slope. These areas are set well back from the river, ranging from approximately 50 to 5,600 feet from the Feather River during typical summer base flows. To compensate for permanent and temporary loss of woody riparian vegetation, SBFCA developed a mitigation and monitoring plan (MMP) to ensure no net loss of habitat functions and values.

Proposed construction and levee repair activities are not likely to result in adverse turbidity- or sedimentation-related effects on winter-run Chinook salmon, spring-run Chinook salmon, steelhead, and green sturgeon or their critical habitat. For the FRWLP, no in-river construction activities are proposed and all activities that will result in physical disturbance or removal of soil or vegetation on the waterside slope of the levee will be limited to areas above the OHWM. With implementation of the stormwater pollution prevention plan (SWPPP) and the associated erosion and sediment control best management practices (BMPs), exposed or imported soil will be largely contained within the immediate project footprint and stabilized using structural or vegetative methods. Any increases in turbidity and sedimentation attributable to the proposed project are expected to be well below levels associated with injury or reduced growth of juvenile salmonids, and will not likely result in significant disruption of normal feeding, sheltering, and migratory behavior of Chinook salmon, steelhead, or green sturgeon.

Contaminants used at construction sites, including gasoline, diesel fuel, lubricants, and hydraulic fluid, could enter the Feather River as result of spills or leakage from machinery or storage containers and injure or kill listed salmon, steelhead, and sturgeon. These substances can kill aquatic organisms through exposure to lethal concentrations or exposure to non-lethal levels that cause physiological stress and increased susceptibility to other sources of mortality such as predation. There is also a slight risk of the release of bentonite into the Feather River during jet grouting or deep soil mixing used to construct slurry cut off walls. Implementation of a spill prevention, control, and countermeasure plan (SPCCP) and bentonite slurry spill contingency plan as part of the environmental commitments of the project is anticipated to minimize the potential for toxic or hazardous spills or discharges into the Feather River. Adherence to all preventative, contingency, and reporting measures in the approved plans will reduce the risk of injury or mortality of listed fish species to negligible levels.

For the FRWLP, sheet piles will be used only as a site-specific treatment at roadway or railroad crossings, and will be restricted to the levee crown above the OHWM where sound waves will be expected to attenuate quickly before reaching the Feather River. Consequently, pile driving activities will have negligible noise and vibration effects on fish in the Feather River.

Potential utilization of the Oroville Wildlife Area dredge tailing site for borrow material could increase the potential for stranding of listed fish species. Based on current estimates, the area identified as a potential source of borrow material is approximately 75 acres and could be lowered up to 10 feet. The proposed elevation of the tailings will remain above the OHWM but will increase the frequency of overbank flows from the Feather River. Following periods of inundation, the tailings could retain surface water or direct surface water to isolated depressions, resulting in fish stranding and high mortality rates due to lethal water temperatures, low dissolved oxygen, predation, and desiccation. If this site is selected as a source of borrow material, SBFCA proposes to re-contour the area to completely drain to the river and reduce the risk of stranding from current levels. The design will be developed in consultation with NMFS, U.S. Fish and Wildlife Service (USFWS), California Department of Fish and Wildlife (CDFW), and the Corps, and submitted to the agencies for approval prior to the start of excavation. A monitoring plan will be developed and implemented to evaluate the effectiveness of the design in minimizing fish stranding and will include provisions for remediation should the design fail to meet established performance or success criteria. The net effect may be beneficial in terms of alleviating current stranding risk while also making more floodplain surface available to fish at lower water surface elevations.

ESA Section 7 Consultation

Based on our review of the material provided with your request and the best scientific and commercial information currently available, NMFS concurs that the Corps determination that the proposed project as described is not likely to adversely affect federally listed CV spring-run Chinook salmon ESU (*O. tshawytscha*), Sacramento River winter-run Chinook salmon ESU (*O. tshawytscha),* CCV steelhead DPS (*O. mykiss*), Southern DPS of North American green sturgeon (*Acipenser medirostris*), or their designated critical habitats. No construction activities are proposed in-river or below the OHWM; all activities that will result in physical disturbance and removal of vegetation on the waterside slope of the levee will be limited to areas above OHWM.

The proposed project is not likely to result in adverse water quality or noise effects on listed fish species or their critical habitat. The proposed project is not likely adversely affect PCEs of critical habitat of winter-run Chinook salmon, spring-run Chinook salmon, steelhead, and green sturgeon. There will be no direct physical impacts to riparian vegetation or SRA cover within the designated critical habitat of these species. Therefore, no physical modification of critical habitat for ESA-listed fish species will be expected because all proposed construction activities will occur above the OHWM of the Feather River.

In addition to the above, NMFS reached this determination based on the incorporation of the following measures into the project description:

(1) Construction personnel will receive worker environmental awareness training. This training will instruct workers to recognized sensitive species and their habitats.
(2) Erosion control BMPs and a SWPPP will be implemented to address and minimize water quality issues.
(3) Where suitable habitat is present for listed species, SBFCA will clearly delineate the construction limits through the use of survey tape, pin flags, orange barrier fencing, or other means, and prohibit any construction-related traffic outside these boundaries.
(4) If a sensitive species is encountered by a biological monitor during construction, activities will cease until appropriate corrective measures have been completed or it has been determined that the species will not be harmed.
(5) Implementation of a spill prevention, control, and countermeasure plan and bentonite slurry spill contingency plan is anticipated to minimize the potential for toxic or hazardous spills or discharges into the Feather River.
(6) To prevent possible resource damage from hazardous materials such as motor oil or gasoline, construction personnel will not service vehicles or construction equipment outside designated staging areas unless it is done offsite.
(7) The biological monitor will record all observations of federally listed species on California Natural Diversity Database field sheets and submit to the Corps, NMFS, USFWS, and CDFW.
(8) Because ground disturbance for the proposed project will be greater than one acre, SBFCA will obtain coverage under the U.S. Environmental Protection Agency's (EPA's) National Pollutant Discharge Elimination System general construction activity stormwater permit.
(9) The specific BMPs that will be incorporated into the erosion and sediment control plan and SWPPP will be site-specific and will be prepared by the construction contractor in accordance with the California Regional Water Quality Control Board Field Manual.
(10) Compensation for permanent and temporary losses of woody riparian vegetation will be achieved through a combination of onsite and offsite compensation. To the extent feasible, SBFCA proposes to conduct onsite compensation in floodplain areas within the proposed project footprint or in the proposed project vicinity. SBFCA proposes to conduct offsite compensation for riparian impacts in the existing 48.5-acre Star Bend Conservation Area, located within the setback area adjacent to the west levee of the Feather River, approximately 6 miles south of Yuba City.
(11) SBFCA prepared an MMP for compensation of riparian impacts with the goal of ensuring no net loss of habitat functions and values. The MMP has been submitted to the

agencies for review and approval. The MMP identifies the compensation ratios and describes how riparian habitat will be restored, monitored, and reported upon over a specified period of time.

(12) To help ensure that there is limited temporal habitat damage to riparian habitat, the mitigation project will be implemented during the fall of 2013.

This concludes ESA section 7 consultation for the proposed project. This concurrence does not provide incidental take authorization pursuant to section 7(b)(4) and section 7(o)(2) of the ESA. Re-initiation of the consultation is required where discretionary Federal agency involvement or control over the proposed project has been retained (or is authorized by law), and if: (1) new information reveals effects of any of the proposed projects that may affect listed species or critical habitat in a manner or to an extent not considered; (2) any of the proposed projects are subsequently modified in a manner that causes adverse effects to listed species or critical habitat; or (3) a new species is listed or critical habitat designated that may be affected by any of the proposed projects.

EFH Consultation

With regards to EFH consultation, the proposed action area has been identified as EFH for Pacific salmon in Amendment 14 of the Pacific Salmon Fishery Management Plan pursuant to the MSA. Federal action agencies are mandated by the MSA (section 305(b)(2)) to consult with NMFS on all actions that may adversely affect EFH, and NMFS must provide EFH conservation recommendations to those agencies (section 305(b)(4)(A)). Based on our review of the material provided, and the best scientific and commercial information currently available, NMFS has determined that the proposed action will adversely affect EFH for Pacific salmon. However, the proposed action includes adequate measures (described in the ESA section 7 Consultation above) to avoid, minimize, or otherwise offset the adverse effects to EFH. Therefore, additional EFH Conservation Recommendations are not being provided at this time and written response as required under section 305(b)(4)(B) of the MSA and Federal regulations (50 CFR 600.920(k)) will not be required. However, if there are substantial revisions to the project description that could result in adverse effects to EFH, the lead Federal agency will need to re-initiate EFH consultation

FWCA Consultation

The purpose of the FWCA is to ensure that wildlife conservation receives equal consideration and is coordinated with other aspects of water resources development (16 U.S.C. 661). The FWCA establishes a consultation requirement for Federal departments and agencies that undertake any action that proposes to modify any stream or other body of water for any purpose, including navigation and drainage (16 U.S.C. 662(a)). Consistent with this consultation requirement, NMFS provides recommendations and comments to Federal action agencies for the purpose of conserving fish and wildlife resources. The FWCA provides the opportunity to offer recommendations for the conservation of species and habitats beyond those currently managed under the ESA and MSA. Because the proposed project is designed to avoid environmental impacts to aquatic habitat within the action area, NMFS has no additional FWCA comments to provide.

Please contact Michael Hendrick at (916) 930-3605, or via e-mail at Michael.Hendrick@noaa.gov, if you have any questions or require additional information concerning this project.

Sincerely,

for Rodney R. McInnis
Regional Administrator

cc: Copy to File ARN 151422SWR2013SA00015
NMFS-PRD, Long Beach, CA

Literature Cited

Beamesderfer, R., M. Simpson, G. Kopp, J. Inman, A. Fuller, and D. Demko. 2004. Historical and current information on green sturgeon occurrence in the Sacramento and San Joaquin rivers and tributaries. Prepared for State Water Contractors by S.P. Cramer and Associates, Inc., Gresham, Oregon. 46 pages.

SWRI. 2003. Literature review of life history and habitat requirements for Feather River fish species. Oroville FERC Relicensing (Project No. 2100) Interim Report SP-F3.2 Task 2/SP-F21 Task 1. January 2003.

Personal Communication

Seesholtz, Alicia. 2008. Environmental Scientist. California Department of Water Resources. Sacramento, CA. September 19, 2008—telephone conversation.

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Sacramento Fish and Wildlife Office
2800 Cottage Way, Room W-2605
Sacramento, California 95825-1846

In Reply Refer To:
08ESMF00-2013-F-0342-1

MAY 02 2013

Ms. Alicia Kirchner
Chief, Planning Division
U.S. Army Corps of Engineers, Sacramento District
1325 J Street
Sacramento, California 95814

Subject: Formal Consultation on the Feather River West Levee Project, Sutter County, California

Dear Ms. Kirchner:

This is in response to your March 22, 2013, request for formal consultation with the U.S. Fish and Wildlife Service (Service) on the Feather River West Levee Project (FRWLP) (proposed project) in Sutter County, California. Your request was received on March 28, 2013. You requested our concurrence that the proposed project may affect, and is likely to adversely affect the federally-listed as threatened valley elderberry longhorn beetle (*Desmocerus californicus dimorphus*)(beetle) and the giant garter snake (*Thamnophis gigas*)(snake). The Service concurs with your determination and this biological opinion addresses the effects of the proposed project on these two species. Critical habitat has been designated for the beetle; however, the proposed project is not located within any designated or proposed critical habitat. Critical habitat has not been designated for the snake; therefore, none will be affected. This response is in accordance with section 7(a)(2) of the Endangered Species Act of 1973, as amended (16 U.S.C. 1531 *et seq.*) (Act).

This biological opinion is based on information provided in the U.S. Army Corps of Engineers' (Corps) letter requesting consultation and their biological assessment. A complete administrative record is on file at the Sacramento Fish and Wildlife Office.

CONSULTATION HISTORY

July 13, 2012. The Service, ICF International, HDR Inc., consultants to Sutter Butte Flood Control Agency (SBFCA), SBFCA, California Department of Fish and Wildlife (CDFW), California Department of Water Resources, and the Corps participated in a site visit to the proposed project. Potential effects to giant garter snake were discussed on the trip.

September 27, 2012. The Service, Corps, HDR, and ICF met to discuss the biological opinion and the level of detail that will be available in order to initiate consultation. The applicant determined that they will have sufficient information to initiate consultation at the project level.

December 18, 2012. The Service, Corps, SBFCA, ICF, and HDR met to discuss effects to giant garter snake. Permanent and temporary effects were discussed as well as the Service providing suggestions on conservation measures that could be incorporated.

February 12, 2013. The Service, Corps, ICF, CDFW, and HDR met to discuss long-term operations and maintenance (O&M). The outcome of this meeting was that the SBFCA FRWLP will not include operations and maintenance in their project description because their project will not be changing O&M. However, the Corps will be initiating consultation on the Sutter Feasibility Study in the next 6 months and this project description will include O&M activities.

March 22, 2013. The Corps initiated section 7 consultation with the Sacramento Fish and Wildlife Office.

BIOLOGICAL OPINION

DESCRIPTION OF ACTION AREA

North to south, the Action Area consists of the 41-mile corridor along the west levee of the Feather River from the Thermalito Afterbay to a point about 4 miles north of the Sutter Bypass. The Action Area includes the project construction area and a 100-foot buffer around this area which includes staging and spoils areas. The project construction area was defined as the area in which levee improvements—such as seepage berms, stability berms, relief wells, sheet-pile walls, and slurry cutoff walls—are likely to be constructed. All direct and indirect effects will occur within this area and the 100-foot buffer around this area.

The corridor is divided into 41 relatively homogeneous reaches for ease of describing existing conditions, project components, land cover-types, and potential effects (note that this number is coincidental and one reach does not correspond to a length of 1 mile; additionally, Reach 1 is not part of the FRWLP) (Figure 1).

The Action Area also includes six potential borrow sites that could supply the borrow material necessary for levee construction and upgrades, and routes from the project construction area to the borrow sites. It is not anticipated that all six sites will be used over the multi-year phased construction period, but until additional geotechnical and soil samplings are completed, all sites will be available for use and are included in the Action Area.

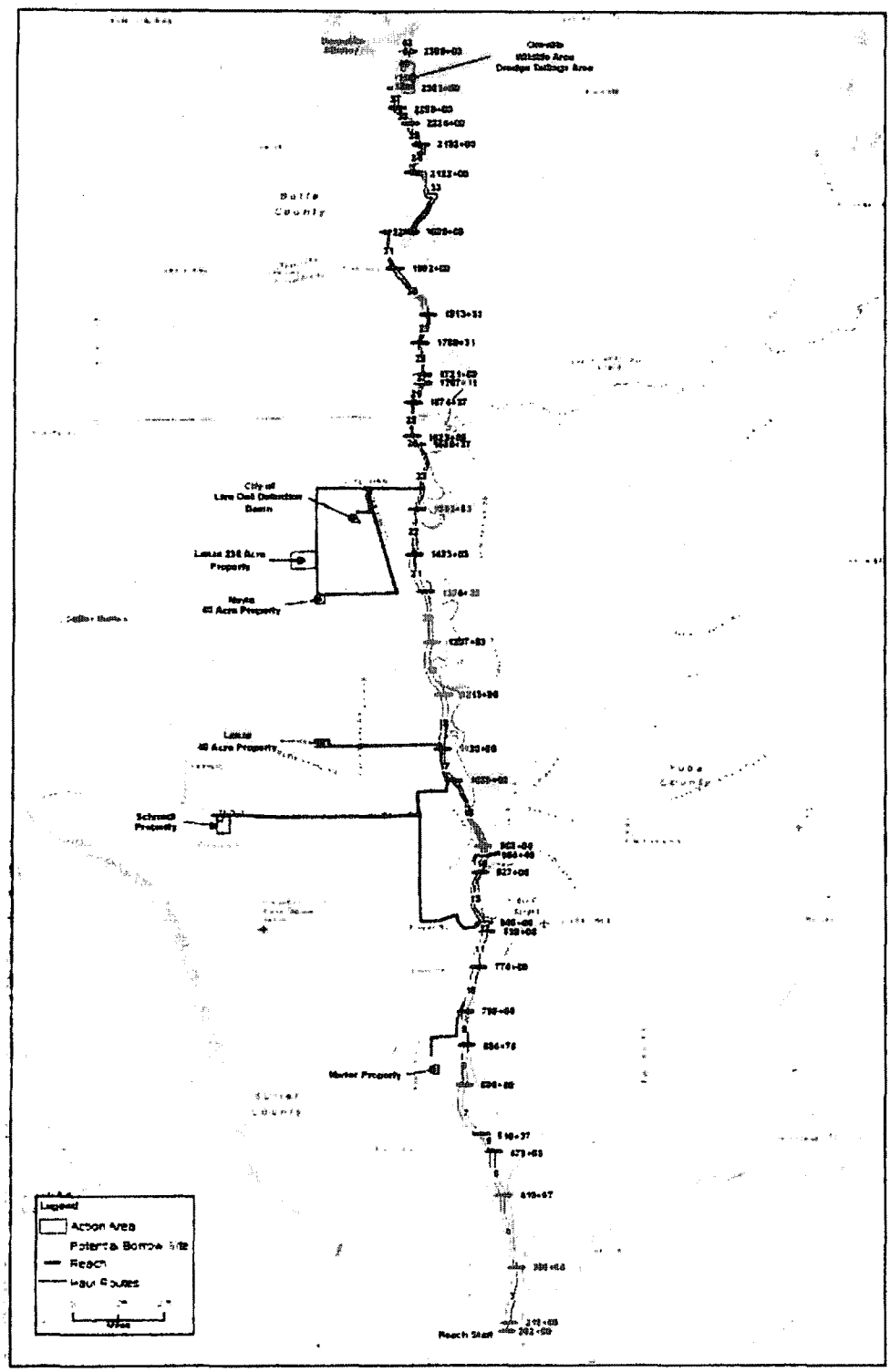

Figure 1. Proposed Project

Finally, the Action Area includes the existing 48.5-acre Star Bend Conservation Area, located on the west levee of the Feather River, about 6 miles south of Yuba City. Compensation for the Proposed Action's effects on the beetle is proposed to occur in a portion of this conservation area, which is discussed below under Conservation Measure 5.

Description of Proposed Action

The primary purpose of the FRWLP is to reduce flood risk in the Sutter Basin by addressing known levee deficiencies along the Feather River West Levee from Thermalito Afterbay downstream to a point about 4 miles upstream of the Feather River's confluence with the Sutter Bypass. While the FRWLP will not by itself reduce all flood risks affecting the Sutter Basin, it will address the most immediate risks based on the following.

- The proximity of the Feather River to population centers and key infrastructure.
- The nature of the Feather River West Levee being the longest and most contiguous portion of the planning area perimeter.
- The location of known levee deficiencies and the clarity and feasibility of available measures to address them.

The construction of the FRWLP will be divided into four separate construction contracts. Contract A begins near the intersection of the Feather River West Levee and Laurel Road. It continues north to the beginning of the improvements constructed as part of the Star Bend Setback Levee Project. The total length of the levee in this portion of the FRWLP is 27,618 linear feet. Contract B begins at the end of the improvements constructed as part of the Star Bend Setback Levee Project, and continues north for 31,963 linear feet. Contract C begins near the north end of the Shanghai Bend Setback Levee, and continues north for a total of 77,886 linear feet. Contract D then begins and continues north for 69,363 linear feet.

For Contract A, a cutoff wall ranging between 10 and 35 feet deep will be constructed along the centerline of the levee for the entire length of levee. The overall height of the levee will be degraded by about 50%. In addition to the cutoff wall, a portion of the levee will have a 9,816-foot-long; 100-foot-wide seepage berm installed.

For Contract B, a cutoff wall ranging between 5 and 25 feet deep will be constructed along the centerline of the levee for 31,600 linear feet. The overall height of the levee will be degraded by about 50%. Relief wells 60 feet apart and 50 feet deep will be installed along a 2,500 linear foot section. Finally, two small sections will involve pipe crossing work.

For Contract C, a cutoff wall ranging between 5 and 65 feet deep will be constructed along the centerline of the levee for 62,117 linear feet. The overall height of the levee will be degraded by about 50%, with about 5,900 linear feet of the levee needing to be fully degraded. A 7-foot tall

and 50-foot-wide seepage berm will be placed near the 10th Street bridge and extend through the existing abandoned railroad tunnel. Finally, there will be a few storm drain pipes replaced within the levee.

For Contract D, a cutoff wall ranging between 10 and 90 feet deep will be constructed along the centerline of the levee for 57,361 linear feet. For all but 317 linear feet of levee, the levee will be degraded by about 50%. The remaining 317 linear feet will have a full levee degrade and reconstruction. A canal runs adjacent to the landside of the levee for 4,723 feet. The landside levee will require reconstruction to the bottom of the canal. Six storm drain and irrigation pipes will need to be replaced along a section of the levee. About 4,800 linear feet of seepage berm will be constructed at the northern end of the proposed project. The berm will very in width between 100 and 170 feet. Additionally, a waterside pit located in this area will be filled.

Materials imported to the construction site will include water, bentonite, cement, incidental construction support materials, aggregate base rock, hydroseed, and up to 1,500,000 cubic yards of embankment fill material for the new levee surfaces from offsite commercial borrow sites or local landowners willing to sell borrow material. For backfill of new pipelines crossing the levee, controlled low strength material (CLSM) (otherwise known as lightweight concrete) will be placed to the pipeline's spring line.

Construction methods for the flood management measures are described in detail below.

Slurry Cutoff Wall

A slurry cutoff wall consists of impermeable material that is placed parallel to the levee, typically through the center of the levee crown. There are three methods for constructing a slurry cutoff wall: (1) conventional slot trench, (2) deep soil mixing (DSM), and (3) jet grouting. The first two are the primary methods for application over longer areas, while jet grouting is a spot application based on limiting conditions. A slurry cutoff wall addresses the deficiency of seepage (through- and under-seepage).

Conventional Slot Trench Method - To begin construction, the construction site and any necessary construction staging or slurry mixing areas are cleared, grubbed, and stripped. In the conventional slot trench method, a trench is excavated at the top center of the levee and into subsurface materials. The size of the trench is based on the severity of the seepage but can be typically 3 feet wide and up to 80–90 feet deep. As the trench is excavated, it is filled temporarily with bentonite water slurry to prevent cave-in. The soil from the excavated trench is hauled to a nearby location where it is mixed with hydrated bentonite to reduce permeability and cement in some applications where increased strength is desired. The soil-bentonite mixture then is returned to the levee and backfilled into the trench. This mixture hardens and creates the impermeable barrier wall in the levee.

In most cases, degradation of the levee crown is necessary to create a large enough working platform to reduce the risk of hydraulic fracturing from the insertion of slurry fluids, and allowing greater depths to be reached. Dependent on the conditions of the particular levee, it may be necessary to degrade the levee by one- to two-thirds its existing height. The material

from degrading the levee is hauled to a nearby stockpile area. Following completion of the slurry cutoff wall, the material is hauled back to the levee to restore the levee to its original dimensions. The material may need to be hauled offsite to a local landfill, and borrow material may need to be imported if the in-situ levee material is found to be unsuitable for current levee standards.

One construction crew typically is able to construct 75–100 linear feet of slurry wall (about 70–80 feet deep) in an 8-hour shift. Equipment needed for the crew includes a long-reach track hoe, three or four dump trucks (15 cubic yard capacity each), two loaders at the mixing location, bulldozers, excavators, loaders, a rough terrain forklift, compactors, maintainers, and a water truck. Vertical clearance of about 40 feet is needed for the excavator boom. Horizontal clearance of about 30 feet beyond the levee crest may be required for excavator swing when loading dump trucks.

A mixing area is located at the construction staging area. The mixing area is to prepare the soil-bentonite mixture and supply bentonite-water slurry. The mixing area is contained to avoid inadvertent dispersal of the mixing materials. Dump trucks haul material between the excavator and the mixing area along the levee.

An access road made of aggregate base rock is constructed on the levee crown to enable regular levee inspections. Post-construction, areas used for construction staging, mixing, the levee crown, slopes, and any other disturbed areas are hydroseeded.

Deep Soil Mixing Method - The DSM method of constructing a slurry cutoff wall uses a crane-supported set of two to four mixing augers (typically 36 inches in diameter) set side by side. These augers are drilled through the levee crown and foundation to the required depth (capable of a maximum depth of about 200 feet). As the augers are inserted and withdrawn, a soil-bentonite grout is injected through the augers and mixed with the native soil. An overlapping series of mixed columns is drilled to create a continuous seepage cutoff barrier.

To provide a wide enough working platform on the levee crown, the upper portion of some segments of the levee requires excavation with a paddle wheel scraper. Material is scraped and stockpiled at a nearby stockpile area. Dependent on the depth of the wall required, vertical clearance for the crane also may be needed. An excavator manipulates injector return spoils near the DSM rig, and transport trucks are used to haul spoils offsite. A crane is used for in-place sampling of DSM material and also for loading bentonite into the batch plant hopper. A mobile batch plant (diesel-powered) is required near each DSM rig at the work area to prepare the cement-bentonite grout. The grout is transported to the DSM rig through flexible hoses. Each batch plant requires a pad of 50 by 100 feet. Hauling at the work area involves scraper runs along the levee to the staging area and cement and bentonite deliveries to the batch plant.

During DSM slurry wall construction, one DSM rig typically can construct 50 linear feet of DSM wall per 8-hour shift (for wall depths up to 135 feet). Post-construction, areas used for construction staging, the levee slopes, and any other disturbed areas are hydroseeded.

Jet Grouting Method - Jet grouting 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. 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 along an entire reach.

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 batching plant with sufficient capacity for the required amount of grout and water. The high-pressure pump conveys the grout, air, and/or water through the drill string to a set of nozzles located just above the drill bit. The diameter of the jet grout column is dependent on site-specific variables such as soil conditions, grout mix, nozzle diameter, rotation speed, withdrawal rate, and grout pressure. Jet grouted columns range from 1 to 16 feet in diameter and are typically interconnected to form cutoff barriers or structural sections. Under ideal conditions, one construction crew—consisting of a site supervisor, pump operator, batch plant operator, chuck tender, and driller—can construct two 6-foot diameter, 50-foot columns per day consisting of about 100 cubic yards of grout injected per 8-hour shift. Ideal conditions will be characterized by no technical issues occurring at either the batch plant or the drilling site, such as loss of fluid pressure, breakdown of equipment, or subsurface obstructions to drilling operations.

To initiate jet grouting, a borehole is drilled through the levee crown and foundation to the required depth (to a maximum depth of about 130 feet) by rotary or rotary-percussive methods using water, compressed air, bentonite, or a binder as the flushing medium. When the required depth is reached, the grout is injected at a very high pressure as the drill string is rotated and slowly withdrawn. Use of the double, triple, and superjet systems create eroded spoil materials that are expelled out of the top of the borehole, this material is frequently used as a construction fill.

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 is scraped and stockpiled at a nearby stockpile area. Hauling at the work area involves scraper runs along the levee to the staging area and grout, bentonite, and water deliveries to the batch plant.

Batch plants are typically centrally located to the injection site, with pipelines for mixed grout that run the length of the work. Grout mixing and injection equipment consists of grout mixers, high powered grout pumps and supporting generators and air compressors, holding tanks, and water tanks, with bulk silos of grout typically used to feed large mixers. Smaller equipment can be used in combination with the single phase-fluid system and can be permanently trailer-mounted to permit efficient mobilization and easy movement at the job site.

Prior to commencing production jet grouting, a field test program is typically completed to evaluate injection parameters and to assess jet grout column geometries, and mechanical and permeability properties. Where possible, jet grout test elements are exposed by excavation and properties are obtained by direct measurement. Where excavation is not possible, core drilling is employed to obtain samples from the jet grout test columns for strength testing.

Areas used for construction staging, the levee slope, and any other disturbed areas are restored and hydroseeded following construction.

Slope Flattening

Slope flattening is a mechanical method to repair or reshape slopes that do not meet standards for geometry and stability. Levee slopes are typically subject to a standard of 3:1 (horizontal to vertical), but this may vary based on site-specific conditions and supporting engineering analysis. Slope flattening addresses the deficiency of slope stability and geometry. To begin slope flattening activities, the area is cleared, grubbed, and stripped to provide space for construction and reshaping of slopes. Additional embankment fill material may be necessary to achieve slope flattening—if so, bulldozers excavate and stockpile borrow material from a nearby permitted borrow site. Front-end loaders load haul trucks with the borrow material. The haul trucks transport the material to slope flattening site. Motor graders spread material evenly according to levee design plans, and sheepsfoot rollers compact the material. Water trucks distribute water over the material to ensure proper moisture for compaction.

To reshape a waterside slope, the existing crown of the levee is shifted farther landward and the waterside slope is trimmed and reshaped to a 3:1 slope. The shifted levee crown will be a minimum of 20 feet wide, with a 3:1 slope on the landward side. An access road made of aggregate base rock is constructed on the levee crown. Post-construction, the construction staging areas, levee slopes, and any other disturbed areas will be hydroseeded.

Stability Berm

A stability berm will be constructed against the landside slope of the existing levee with the purpose of supplying support as a buttress. The height of the stability berm is generally two-thirds the height of the levee; the structural needs of the levee determine the distance it extends along that reach. A stability berm addresses the deficiency of stability. To begin the construction of a stability berm, the site is cleared, grubbed, and stripped to provide space for construction and shaping of the berm. Embankment fill material necessary to construct the berm is excavated by a bulldozer from a nearby borrow site. Front-end loaders load haul trucks with the borrow material, and the haul trucks transport the material to the stability berm site. Motor graders spread the material evenly according to design specifications, and a sheepsfoot roller compacts the material. Water trucks distribute water over the material to ensure proper moisture for compaction.

Stability berms may be drained or undrained. An undrained berm consists of embankment fill only. A drained berm includes a layer of drain rock placed along the ground surface underneath the fill material, separated by a casing of filter fabric. Drainage water seeping from the berm will sheetflow on the adjacent landside surface.

Levee Reconstruction

Levee reconstruction will be necessary where a levee has been degraded to facilitate implementation of another measure (such as a slurry cutoff wall), where a substantial

encroachment has been removed from within the levee prism, or otherwise where the levee is found to be deficient and needs to be replaced with materials and methods that meet current engineering standards. The existing levee is first cleared, grubbed, and stripped to the desired surface to allow a working platform for other measures (such as a slurry cutoff wall), to remove an encroachment, or to remove substandard material. Embankment fill material necessary to construct the new levee is excavated by a bulldozer from a nearby borrow site. Front-end loaders load haul trucks with the borrow material and the haul trucks transport the material to the stability berm site. Motor graders spread the material evenly according to design specifications, and a sheepsfoot roller compacts the material. Water trucks distribute water over the material to ensure proper moisture for compaction. The new levee will be built in cross section to meet current engineering standards.

Sheet-Pile Wall

A sheet-pile wall is a series of vertical panels of interlocking steel that is placed parallel to the levee, typically through the center of the levee crown to provide an impermeable barrier. A sheet-pile wall addresses the deficiencies of seepage and will be used only as a site-specific treatment (rather than applied on a reach-wide basis) such as at roadway or railroad crossings. The site where sheet piles are to be installed is cleared, grubbed, and stripped to allow for construction activities, including removal of the roadway or railroad. A hydraulic- or pneumatically-operated pile-driving head attached to a crane drives the sheet pile into the levee crown to the desired depth (up to 135 feet). If the levee material is particularly solid, pre-drilling may be necessary. The conditions of the site and the desired life of the project determine the thickness and configuration of the sheet piles.

Post-construction, construction staging areas, the levee crown, slopes, and any other disturbed areas are hydroseeded and the roadway or railroad will be replaced in-kind to the pre-project condition.

Seepage Berm

Seepage berms are wide embankment structures made up of low-permeability materials that resist accumulated water pressure and safely release seeping water. A seepage berm is typically one-third the height of the levee, extending outward from the landside levee toe for 300–400 feet, and laterally along the levee as needed relative to the seepage conditions. A seepage berm addresses the deficiency of under-seepage. A seepage berm can vary in width, from a minimum of four times the levee height to a maximum of 300 feet. Berm heights can also vary but are typically a minimum of 5 feet tall at the landside toe of the levee and generally taper down to 3 feet at the end of the berm.

Construction consists of clearing, grubbing, and stripping the ground surface. Bulldozers then excavate and stockpile borrow material from a nearby borrow site. Front-end loaders load haul trucks, and the haul trucks subsequently transport the borrow material to the berm site. The haul trucks dump the material and motor graders spread it evenly, placing 3–5 feet of embankment fill material. Sheepsfoot rollers compact the material, and water trucks distribute water over the material to ensure proper moisture for compaction.

Seepage berms may have an optional feature of a drainage relief trench under the toe of the berm. Drained seepage berms include the installation of a drainage layer (gravel or clean sand) beneath the seepage berm backfill and above the native material at the levee landside toe. A drained seepage berm does not increase the overall footprint of the berm. Post-construction, areas used for construction staging, the levee, the berm, and any other disturbed areas are hydroseeded.

Relief Wells

Relief wells are passive systems that are constructed near the levee landside toe to provide a low-resistance pathway for under-seepage to exit to the ground surface in a controlled and observable manner. A low-resistance pathway allows under-seepage to exit without creating sand boils or piping levee foundation materials. Relief wells are an option only in reaches where geotechnical analyses have identified continuous sand and gravel layers. Relief wells are constructed using soil-boring equipment to drill a hole vertically through the fine-grained blanket layer (sand) into the coarse-grained aquifer layer (gravel) beneath. Pipe casings and gravel/sand filters are installed to allow water to flow freely to the ground surface, relieving the pressure beneath the clay blanket without transporting fine materials to the surface, which can undermine the levee foundation. Relief wells will be designed to discharge onto a cobble splash, and the water will then sheet flow into adjacent agricultural fields. In areas where sheet flow is not feasible, a swale will be excavated and connected to a drainage canal.

Relief wells generally are spaced at 50- to 100-foot intervals, dependent upon the amount of under-seepage, and extend to depths of 150 feet. Areas for relief well construction are cleared, grubbed, and stripped. During relief well construction, a typical well-drilling rig is used to drill to the required depth and construct the well (including well casing, gravel pack material, and well seal) beneath the ground surface. The drill rig likely will be an all-terrain, track-mounted rig that could access the well locations from the levee toe.

Piezometers, also called monitoring wells, could be installed between relief wells to allow monitoring of groundwater levels to ensure the wells are relieving the pressure within the aquifer.

Areas along the levee toe may be used to store equipment and supplies during construction of each well. Construction of each well and the lateral drainage system typically takes 10–20 days. Additional time may be required for site restoration. Post-construction, areas used for construction staging, the levee slopes, and any other disturbed areas are hydroseeded.

Depression/Ditch Infilling

Landside depressions and ditches can contribute to risk of levee failure if a seepage pathway forms under the levee and the water then surfaces through the depression or ditch, exploiting its less resistive nature compared to surrounding soil mass. This measure involves placing fill soil in such depressions and ditches to remove localized susceptibility to seepage. Construction consists of clearing, grubbing, and stripping the ditch or depression surface to remove vegetative material. Bulldozers then excavate and stockpile borrow material from a nearby borrow site.

Front-end loaders load haul trucks, and the haul trucks subsequently transport the borrow material to the fill site. The depression or ditch may be further excavated to provide a surface that the fill soil may be keyed into. The haul trucks dump the material and motor graders or bulldozers smooth the material level with the surrounding land surface. An excavator may also be used for placement. Sheepsfoot rollers compact the material, and water trucks distribute water over the material to ensure proper moisture for compaction.

Removal and Relocation of Pacific Gas & Electric Facilities

Prior to and/or concurrent with levee rehabilitation construction, Pacific Gas and Electric Company (PG&E) will need to remove and relocate facilities located within the footprint of the FRWLP. PG&E's utility relocations will need to occur in advance of SBFCA's construction activities at any given location. Construction sequencing for SBFCA's work will be dynamic throughout SBFCA's project planning and design. PG&E's construction schedule will be determined by further engineering to clarify and determine efficacy of site-specific measures; the availability of funding for FRWLP; easement and right-of-way acquisition; availability of borrow material for the levee improvement activities; and/or environmental clearances based on wildlife presence, lifecycle activity, and location of habitats. PG&E's construction schedule will be further influenced by utility operation and maintenance constraints, particularly for relocation activities that require taking existing facilities temporarily out of service. As necessary, geotechnical mitigation measures will be incorporated into construction design to ensure that utility facilities effectively co-exist with the FRWLP, relocation will be done where this is not feasible.

For PG&E's electrical transmission and distribution activities, PG&E will install and remove new electrical transmission and distribution poles. Electrical transmission and distribution pole removal is conducted by a line crew, who typically access each pole site with a line truck and trailer or a boom truck, except in those instances when the pole is located on the levee crown (a crane may be used in those instances). On average, removal of vegetation up to 50 feet from the toe of the levee will need to occur to accommodate pole installation activities; this distance may be greater in instances where the installation activity is located further than 30 feet from the levee toe. After vegetation is cleared, PG&E will remove and replace the existing wood distribution and power poles and related equipment.

For PG&E's natural gas transmission and distribution activities, PG&E will install gas transmission and distribution steel pipe. This also typically includes the removal and disposal of existing pipe. Other typical types of gas transmission and distribution equipment that may be installed include Electric Test System/ Gas Cathodic Test System meter stations for future pipe monitoring purposes, and pipeline markers at angle points and at levee crossing locations. Clearing and grading operations in support of installation of natural gas facilities typically involve preparation of the right-of-way, including vegetation removal, debris disposal, and land leveling. Installation sites are backfilled using sand to create a 6-inch insulation zone around the pipe and then covered by native soil from the project area. In some instances, a crane may be required to place pipe at crossing sites located at the crowns of the levees. Dump trucks will be used to transport sand and soil materials. Spoil piles may be temporarily placed onsite while the installation activities are occurring.

Hydrostatic testing associated with installation of natural gas facilities will be performed to test the strength of the new pipeline. Test water intake and discharge will be performed in accordance with all regulations and permit requirements.

Typical electrical and natural gas transmission and distribution project work schedules are comprised of an average 9-hour day, at an average of 6 days per week per crew. Typical crews consist of 3 to 5 members.

PG&E work areas will be about 125 feet by 125 feet in diameter and located in close proximity to installation activity locations. On average, PG&E will require up to 10 work areas per contract phase. PG&E will utilize the work areas identified by SBFCA whenever possible. Typically, PG&E project access is achieved through existing public and private roads. Removal of vegetation to utilize access roads by PG&E equipment and transport of facilities may be required. PG&E currently owns easements along the entire project corridor. However, temporary and/or permanent easements as required for construction and maintenance of these facilities are being acquired by SBFCA.

Encroachment and Vegetation Removal

Encroachments - Existing facilities found within the footprint of an alternative may require removal and replacement nearby, abandonment, or relocation. Encroachments are numerous (over 400 identified) along the Feather River West Levee and may need to be addressed if they present a threat to the stability of the levee, do not currently comply with the levee encroachment criteria, or will be disrupted or otherwise impacted by construction activities. Typical encroachments include pressure pipelines (water supply pipelines from waterside pump stations and drainage pipelines from landside drainage pump stations), gravity drainage pipes, gas lines, telephone utilities, overhead utilities, structural encroachments, and other types and variations. Debris from structure and embankment fill material of poor quality will be hauled offsite to a permitted disposal site within 20 miles of the removal location.

Vegetation Removal - Vegetation removal will involve stripping of herbaceous (non-woody) vegetation by bulldozer. Vegetation will be removed only from within the direct construction footprint and the minimum areas necessary for staging and access. Consistent with the Central Valley Flood Protection Plan guidance for levee repair or improvement, vegetation will be removed to meet specific project objectives. Any vegetation removed as part of direct construction activities will not be replaced at that location, but will involve offsite, in-kind mitigation, to be determined in consultation with the appropriate resource agencies.

In accordance with the State of California's Urban Levee Design Criteria, at a minimum, all roots larger than 1.5 inches in diameter that are within 3 feet of the perimeter of the tree trunk will be removed. Immature trees less than 4 inches in diameter at breast height that will be removed may be cut off at or below ground level, generally without root removal. Any excavation will be

backfilled with engineered fill using appropriate placement, moisture conditioning, and compaction methods. Additional measures for removing non-compliant vegetation are listed below.

- Ensure that the resulting void is free of organic debris.
- Cut poles to salvage propagation materials for replanting, such as willows and cottonwoods.
- Conduct hand clearing using chainsaws and trimmers.
- Conduct mass clearing using bulldozers.

Debris from vegetation removal will be hauled offsite to a permitted disposal site within 20 miles of the removal location.

Construction Staging, Access, and Temporary Facilities

Staging areas will only be provided within the Action Area. Staging areas will be used for staging construction activities and to provide space to house construction equipment and materials, offices, employee parking, and other uses needed for construction of the proposed project.

To facilitate construction, temporary earthen ramps will be constructed for equipment access between the levee crown and the staging area(s). The earthen ramps will be removed when construction is complete.

Cutoff wall construction requires temporary establishment of an onsite slurry batch plant that will occupy about 1–2 acres. Batch plants will be located at about 1-mile intervals along the levee. The batch plant site will likely contain tanks for water storage, bulk bag supplies of bentonite, bentonite storage silos, a cyclone mixer, pumps, and two generators that meet air quality requirements. Slurry ingredients will be mixed with water and the mixture will be pumped from tanks through pipes to the construction work sites. The batch plant will produce two different slurry mixes, one for trench stabilization and one for the soil backfill mix. Therefore, two slurry pipes or hoses, typically 4- or 6-inch high-density polyethelene pipes, will be laid on the ground and will extend to all work sites. An additional pipe may be used to supply water to the work sites.

Staging, access, and other temporary construction areas will be located away from wetlands, woody vegetated areas, wildlife species habitat, known cultural resources, or other sensitive areas and will be limited to disturbed or ruderal grasslands subject to review by Corps and resource agencies.

Material Importation, Reuse, and Borrow

Materials imported to the FRWLP construction area will include water, bentonite, cement, incidental construction support materials, aggregate base rock, asphalt, concrete, hydroseed, and embankment fill soil. Large quantities of fill soil, or borrow will be required. To meet borrow demands, embankment fill material excavated as part of construction will be evaluated for reuse. Embankment fill material deemed suitable will be used as part of levee reconstruction and berms. The total volume of material required is 1,500,000 cubic yards.

SBFCA has explored the option of purchasing fill or borrow material from a local commercial quarry or other permitted source; however, there are not currently any sites near the Action Area that could supply the volume and type of material required. Consequently, SFBCA plans to purchase fill from local landowners willing to sell borrow material.

Six borrow sites have been identified in the Action Area. Each site was investigated to determine the quantity of available material, hauling distance, material composition, groundwater elevation, and prospects for acquisition. Sufficient fill volume is estimated to be present within an approximate 10-mile, one-way haul distance from the area of construction.

SBFCA will maximize the potential borrow sites' use through gradation, placement, and treatment so that they could continue to be used for their current use or otherwise returned to their pre-project condition. As part of borrow operations, the upper 4–6 inches of topsoil will be set aside and replaced after construction in each construction season. After the FRWLP is completed, the borrow site will be re-contoured and reclaimed.

Through outreach efforts, SBFCA identified a number of sites owned by individuals or government agencies willing to sell their property or provide material on a cubic yard basis. Each borrow site is described below.

North Valley Property - The North Valley property is owned by North Valley Properties, LLC and is located south of Ella Road between Feather River Boulevard and Arboga Road. The Wheeler Ranch housing development is proposed at the site. Borrow for the FRWLP will be taken from the northeast corner of the property to create a 24.5 acre detention pond (referred to as the Drainage Basin C Regional Detention Pond, but commonly referred to as the South Ella Detention Pond). The Ella Basin is being constructed as part of Reclamation District No. 784's Master Drainage Plan. Historically, the site was cultivated for agricultural purposes. Currently, the site is disked ruderal grassland with some roads cut in the southern portion of the property for the Wheeler Ranch development. The depth of excavation is anticipated to be 15–20 feet and the yield of material from this site could be 400,000–500,000 cubic yards. Borrow material from this site will be used for work in Contracts B and C. If borrow material is remaining, it may also be used for Contract D. The haul route to Contract C will use existing roads. The post-project land use of the site will be a regional detention pond for Reclamation District No. 784.

Marler Property - The Marler property is a 10-acre property at Johnson Road near Messick Road, north of Star Bend and south of Shanghai Bend. The site is currently an orchard. The depth of

excavation could be upwards of 6 feet. The yield of material from this site could be 75,000 cubic yards. The haul route will use existing roads. The post-project land use for the property will be agricultural production, likely row crops or orchard.

Lanza Property - The Lanza property is 40 acres in size and is currently farmed in field/row crops. It is located at North Township Road and Pease Road south of Live Oak and north of Yuba City. The site has not yet been investigated to determine the types of materials present. Excavation of the site to a depth of 6 feet may occur. The yield of material from this site could be 200,000 cubic yards. The likely haul route will be along Pease Road directly east to the levee. The post-project land use for the property will be rice production.

City of Live Oak Detention Basin - Live Oak owns the property formerly known as the Caltrans Detention Basin Site located west of SR 99 and south of Paseo Avenue. The site is currently fallow. Live Oak intends to construct soccer fields and a stormwater detention basin at the site in 2013 or later. Although the site will require hauling for a short distance through a residential neighborhood, it is anticipated the residents will be amenable to the hauling as it will be a part of the public amenity constructed by Live Oak. This site is about 25 acres, and the depth of excavation is anticipated to be 3–6 feet. The yield of material from this site could be 125,000 cubic yards, and will likely be used for Contract C. Haul routes will use existing roads.

Live Oak (2012) reports that land at this location has historically been cultivated for agricultural purposes and reported that there was no evidence of any wetland or other sensitive plant or wildlife areas remaining onsite. No wetland features were identified during a preliminary wetland delineation of the area in December 2012. The previous agricultural use has displaced native species of plants and animals except those varieties capable of co-existing with humans in urban settings. The post-project use of the site will be a community park and stormwater detention basin facility.

Oroville Wildlife Area Dredge Tailings Area - This site is within the Oroville Wildlife Area and consists of several mounds of dredge tailings waterside of the existing levee. The material is suitable for use in seepage berms in Contract D. The availability of tailings in the area should be sufficient to meet the total deficit for berm material in these reaches. The excavation of the material will be coordinated to maximize hydraulic benefits from the reshaping of the overbank area. The site also represents an opportunity to provide waterside habitat enhancements. The useful area of this site could be about 75 acres and the depth of excavation could be upwards of 10 feet. The yield of material from this site could be 375,000 cubic yards. Hauling from this site will not take place on public roads. It is anticipated the contractor will use an existing waterside levee ramp (or create one), directly accessing the levee patrol road. The future land use for this site will be similar to its present day use (managed habitat area).

Construction Timing

Specific sequencing of construction will be dynamic throughout planning and design of the FRWLP, subject to change based on factors including the following.

- Further engineering in determining the clarity and efficacy of site-specific measures.

- Easement and right-of-way acquisition (where necessary).
- Availability of proximate, suitable, and cost-effective borrow material.
- Environmental clearances based on wildlife presence, lifecycle activity, and location of habitats.

Based on current planning analysis for the FRWLP, construction will occur in more than one annual construction season (typically April 15 to November 30, subject to conditions). Although subject to change, the four contracts and their respective areas for construction of the FRWLP are identified below.

- Contract A, 2016 – 2017
- Contract B, 2014 – 2015
- Contract C, 2013 – 2014
- Contract D, 2014 – 2015

Construction is anticipated to occur in single 10-hour shifts, 6 days per week. An exception to this schedule is slurry cutoff wall construction, which is anticipated to occur in two 10-hour shifts (essentially 24-hour construction), 6 days per week. While actual construction will not occur between the two 10-hour shifts, equipment maintenance and preparations for the upcoming work shift will occur.

Conservation Measures

SBFCA will implement the following conservation measures to avoid and minimize effects on federally listed species. To ensure their implementation, the measures listed below will be included in the project specifications.

General

Conservation Measure 1: Conduct Mandatory Biological Resources Awareness Training for All Project Personnel and Implement General Requirements

Before any ground-disturbing work (including vegetation clearing and grading) occurs in the Action Area, a Service-approved biologist will conduct a mandatory biological resources awareness training for all construction personnel about federally-listed species that could potentially occur onsite (beetle and snake). The training will include the natural history, representative photographs, and legal status of each federally-listed species and avoidance and minimization measures to be implemented. Proof of personnel attendance will be provided to the Service within 1 week of the training. If new construction personnel are added to the project, the contractor will ensure that the new personnel receive the mandatory training before starting work. The subsequent training of personnel can include videotape of the initial training and/or the use of written materials rather than in-person training by a biologist. Requirements that will be followed by construction personnel are listed below.

- Where suitable habitat is present for listed species, SBFCA will clearly delineate the construction limits through the use of survey tape, pin flags, orange barrier fencing, or other means, and prohibit any construction-related traffic outside these boundaries.
- Project-related vehicles will observe the posted speed limit on hard-surfaced roads and a 10-mile-per-hour speed limit on unpaved roads during travel in the project construction area. Project-related vehicles and construction equipment will restrict off-road travel to the designated construction areas.
- All food-related trash will be disposed of in closed containers and removed from the project construction area at least once per week during the construction period. Construction personnel will not feed or otherwise attract fish or wildlife to the project site.
- No pets or firearms will be allowed in the project construction area.
- To prevent possible resource damage from hazardous materials such as motor oil or gasoline, construction personnel will not service vehicles or construction equipment outside designated staging areas.
- Any worker who inadvertently injures or kills a federally-listed species or finds one dead, injured, or entrapped will immediately report the incident to the biological monitor and construction foreman. The construction foreman will immediately notify SBFCA, who will provide verbal notification to the Sacramento Fish and Wildlife Office and the local CDFW warden or biologist within 1 working day. SBFCA will follow up with written notification to Service and CDFW within 5 working days. The biological monitor will follow up with SBFCA to ensure that the wildlife agencies were notified.
- The biological monitor will record all observations of federally-listed species on California Natural Diversity Database (CNDDB) field sheets and submit to CDFW.

Valley Elderberry Longhorn Beetle

Conservation measures for the beetle are based on Service's 1999 *Conservation Guidelines for the Valley Elderberry Longhorn Beetle* (Conservation Guidelines) (U.S. Fish and Wildlife Service 1999a).

Conservation Measure 2: Fence Elderberry Shrubs to be Protected and Monitor Fencing during Construction

Elderberry shrubs/clusters within 100 feet of the construction area that will not be removed will be protected during construction. A qualified biologist (i.e., with elderberry/beetle experience), under contract to SBFCA, will mark the elderberry shrubs and clusters that will be protected during construction. Orange construction barrier fencing will be placed at the edge of the respective buffer areas. The buffer area distances will be proposed by the biologist and approved by the Service. No construction activities will be permitted within the buffer zone other than those activities necessary to erect the fencing. Signs will be posted every 50 feet (15.2 meters) along the perimeter of the buffer area fencing. The signs will contain 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.

In some cases, where the elderberry shrub dripline is within 10 feet of the work area, k-rails will be placed at the shrub's dripline to provide additional protection to the shrub from construction equipment and activities. Temporary fences around the elderberry shrubs and k-rails at shrub driplines will be installed as the first order of work. Temporary fences will be furnished, constructed, maintained, and later removed, as shown on the plans, as specified in the special provisions, and as directed by the project engineer. Temporary fencing will be 4 feet (1.2 meters) high, commercial-quality woven polypropylene, orange in color.

Buffer area fences around elderberry shrubs will be inspected weekly by a qualified biological monitor during ground-disturbing activities and monthly after ground-disturbing activities until project construction is complete or until the fences are removed, as approved by the biological monitor and the resident engineer. The biological monitor will be responsible for ensuring that the contractor maintains the buffer area fences around elderberry shrubs throughout construction. Biological inspection reports will be provided to the project lead and the Service.

Conservation Measure 3: Conduct Beetle Surveys Prior to Elderberry Shrub Transplantation

Surveys of elderberry shrubs to be transplanted will be conducted by a qualified biologist prior to transplantation. Surveys will be conducted in accordance with the Conservation Guidelines (U.S. Fish and Wildlife Service 1999a). The biologist will survey the area surrounding the shrub to be transplanted to ensure that there are not additional elderberry shrubs that need to be removed. Surveys will consist of counting and measuring the diameter of each stem, and examining elderberry shrubs for the presence of beetle exit holes. Survey results and an analysis of the number of elderberry seedlings/cuttings and associated native plants based on the survey results will be submitted to the Service. SBFCA plans to plant elderberry seedlings/cuttings and associated native plants prior to transplantation of elderberry shrubs. The data collected during the surveys prior to transplantation will be used to determine if SFBCA is exceeding their compensation needs or if additional plantings are necessary. Because the Proposed Action will be constructed in four separate contracts, elderberry survey data for each contract will be used to rectify any discrepancies in compensation for the previous contract and to ensure that SBFCA has minimized effects to the beetle.

Conservation Measure 4: Water Down Construction Area to Control Dust

SFBCA or the contractor will ensure that the project construction area will be watered down as necessary to prevent dirt from becoming airborne and accumulating on elderberry shrubs within the 100–foot buffer.

Conservation Measure 5: Compensate for Direct and Indirect Effects on Valley Elderberry Longhorn Beetle Habitat

Before construction begins, SBFCA will compensate for direct effects on elderberry shrubs by transplanting shrubs that cannot be avoided to a Service-approved conservation area (described below). Elderberry seedlings or cuttings and associated native species will also be planted in the conservation area. Each elderberry stem measuring 1 inch or greater in diameter at ground level that is adversely affected (i.e., transplanted or destroyed) will 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). 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 the shrub lies in a riparian or non-riparian area. Stock of either seedlings or cuttings will be obtained from local sources (including the Action Area if acceptable to the Service).

At the discretion of the Service, shrubs that are unlikely to survive transplantation because of poor condition or location, or a plant that will be extremely difficult to move because of access problems, may be exempted from transplantation. In cases where transplantation is not possible, compensation ratios will be increased to offset the additional habitat loss.

The relocation of the elderberry shrubs will be conducted according to Service-approved procedures outlined in the Conservation Guidelines (U. S. Fish and Wildlife Service 1999a). Elderberry shrubs within the project construction area that cannot be avoided will be transplanted during the plant's dormant phase (November through the first 2 weeks of February). A qualified biological monitor will remain onsite while the shrubs are being transplanted.

Property inaccessibility and the high density of vegetation along portions of the Feather River riparian corridor limited the number of elderberry shrubs that could be surveyed (73 shrubs were surveyed). For this reason, compensation for the removal of 91 shrubs was estimated based on the average number of stems in each stem diameter range for the 73 shrubs that could be surveyed. Those average shrub stem counts are as follows.

- Number of stems $\geq$1 inch and $\leq$3 inches = 4.
- Number of stems >3 inches and <5 inches = 1.
- Number of stems $\geq$5 inches = 1.

Table 1 shows the estimated compensation. Because the shrubs are located in riparian habitat and did not have exit holes, the compensation ratios for these conditions were used. As noted in Table 1, one elderberry shrub will need to be transplanted prior to the start of work in 2013 (in Reach 13) and outside of the elderberry dormancy period.

Based on the information in Table 1, the conservation area will be at least 12.15 acres in size to accommodate about 91 elderberry shrubs, 1,470 elderberry cuttings or seedlings, and 1,470 native plants. The conservation area in which the transplanted elderberry shrubs and seedlings are planted will be protected in perpetuity as habitat for the beetle.

Evidence of beetle occurrence in the conservation area, the condition of the elderberry shrubs in the conservation area, and the general condition of the conservation area itself will be monitored over a period of 10 consecutive years or for 7 years over a 15-year period from the date of transplanting. SBFCA will be responsible for funding and providing monitoring reports to the Service in each of the years in which a monitoring report is required. As specified in the Conservation Guidelines, the report will include information on timing and rate of irrigation, growth rates, and survival rates and mortality.

Table 1. Elderberry Stem Sizes and Compensation

Location	Stems (maximum diameter at ground level)	Exit Hole on Shrub (Yes or No)	Elderberry Seedling Ratio	Associated Native Plant Ratio	Multiplier for transplanting between June 15 – August 15	Number of Stems	Required Elderberry Plantings	Required Associated Native Plant Plantings
Riparian	stems ≥1" & ≤3"	No	2:1	1:1	No	360	720	720
Riparian	stems > 3" & <5"	No	3:1	1:1	No	90	270	270
Riparian	stems > 5"	No	4:1	1:1	No	90	360	360
2013 Construction - Reach 13								
Riparian	stems ≥1" & ≤3"	No	2:1	1:1	2.5	1	5	5
Riparian	stems > 3" & <5"	No	3:1	1:1	2.5	2	15	15
Riparian	stems > 5"	No	4:1	1:1	2.5	10	100	100
Total replacement plantings							1,470	1,470
Total elderberry shrubs to be transplanted								91
2940 /10 = 294 valley elderberry longhorn beetle credits or 12.15 acres								

To meet the success criteria specified in the Conservation Guidelines, a minimum survival rate of 60% of the original number of elderberry replacement plantings and associated native plants must be maintained throughout the monitoring period.

Proposed Conservation Area

SBFCA proposes to transplant elderberry shrubs to the existing 48.5-acre Star Bend Conservation Area, located on the west levee of the Feather River, about 6 miles south of Yuba City. In 2009, Levee District 1 of Sutter County proposed to construct the Feather River Setback Levee and Habitat Enhancement Project at Star Bend to replace a portion of existing levee that poses a high risk of failure in order to decrease the flood stage, velocity, and scour potential; increase and improve floodplain habitat; and improve habitat connectivity between the Abbot Lake and O'Connor Lakes Units of CDFW's Feather River Wildlife Area. The Star Bend project created 48.5 acres of floodplain habitat, which included habitat enhancement and onsite compensation for impacted elderberry shrubs.

In 2009, River Partners and Stillwater Sciences prepared a *Habitat Enhancement Plan for the Feather River Setback Levee and Habitat Enhancement Project at Star Bend* to be implemented by Levee District 1. It provides further information on the conditions at the time the site was proposed. About 20 acres have been used for elderberry transplants and associated native plants. In early 2012, a fire at the Star Bend site damaged portions of the site; however, elderberry shrub

planting losses were minimal. The remaining 28.5 acres are available at the conservation area for compensating for impacts on elderberry shrubs from construction of the FRWLP. The long-term goal of the conservation area is to merge this area with CDFW's adjoining O'Conner Lakes and Abbott Lakes Wildlife Units. SBFCA will prepare a mitigation and monitoring plan for the 28.5 acres that are available and will be used as a conservation area for effects to the beetle, as well as riparian impacts. This plan is currently being coordinated with the Service, Corps, and CDFW. Additionally, SBFCA will obtain a conservation easement for the 28.5 acre conservation area.

Giant Garter Snake

Conservation Measure 6: Conduct Construction Activities during the Active Period for Giant Garter Snake

Construction activity within giant garter snake aquatic and upland habitat (200 feet of aquatic habitat) will be conducted during the snake's active period (May 1–October 1). During this timeframe, potential for injury and mortality are lessened because snakes are actively moving and avoiding danger. The only work that will be conducted outside of the active season is levee slope flattening within the Sutter-Butte Canal in Reaches 26–28 (scheduled for 2016) and pipe reconstruction at two sites in the same reaches because these activities must be conducted when the canal is dry (February–March). Additional protective measures will be implemented at these locations (see Conservation Measure 14 below).

Conservation Measure 7: Install and Maintain Exclusion and Construction Barrier Fencing around Suitable Giant Garter Snake Habitat

To reduce the likelihood of giant garter snakes entering the construction area, SBFCA will install exclusion fencing and orange construction barrier fencing along the portions of the construction area that are within 200 feet of suitable aquatic and upland habitat. The exclusion and construction barrier fencing will be installed during the active period for giant garter snakes (May 1–October 1) to reduce the potential for injury and mortality during this activity.

The construction specifications will require that SBFCA or its contractor retain a qualified biologist to identify the areas that are to be avoided during construction. Areas adjacent to the directly affected area required for construction, including staging and access, will be fenced off to avoid disturbance in these areas. Before construction, the contractor will work with the qualified biologist to identify the locations for the barrier fencing and will place flags or flagging around the areas to be protected to indicate the locations of the barrier fences. The protected area will be clearly identified on the construction specifications. The fencing will be installed the maximum distance practicable from the aquatic habitat areas and will be in place before construction activities are initiated.

The exclusion fencing will consist of 3-foot-tall silt fencing buried 6 inches below ground level. The exclusion fencing will ensure that giant garter snakes are excluded from the construction area and that suitable upland and aquatic habitat is protected throughout construction. The construction barrier fencing will be commercial-quality, woven polypropylene, orange in color,

and 4 feet high (Tensor Polygrid or equivalent). The fencing will be tightly strung on posts with a maximum of 10-foot spacing.

Barrier and exclusion fences will be inspected daily by a qualified biological monitor during ground-disturbing activities and weekly after ground-disturbing activities until project construction is complete or until the fences are removed, as approved by the biological monitor and the resident engineer. The biological monitor will be responsible for ensuring that the contractor maintains the buffer area fences around giant garter snake habitat throughout construction. Biological inspection reports will be provided to the project lead and the Service.

Conservation Measure 8: Minimize Potential Impacts on Giant Garter Snake Habitat

SBFCA will implement the following measures to minimize potential impacts on giant garter snake habitat.

- Staging areas will be located at least 200 feet from suitable giant garter snake habitat.
- Any dewatered habitat will remain dry for at least 15 consecutive days after April 15 and prior to excavating or filling of the dewatered habitat.
- Vegetation clearing within 200 feet of the banks of suitable giant garter snake aquatic habitat will be limited to the minimum area necessary. Avoided giant garter snake habitat within or adjacent to the Action Area will be flagged and designated as an environmentally sensitive area, to be avoided by all construction personnel.
- The movement of heavy equipment within 200 feet of the banks of suitable giant garter snake aquatic habitat will be confined to designated haul routes to minimize habitat disturbance.

Conservation Measure 9: Prepare and Implement a Stormwater Pollution Prevention Plan

SBFCA will prepare a stormwater pollution prevention plan (SWPPP) that describes the BMPs that will be implemented to control accelerated erosion, sedimentation, and other pollutants during and after project construction. The SWPPP will be prepared prior to commencing earth-moving construction activities. This will also comply with the U.S. Environmental Protection Agency's National Pollutant Discharge Elimination System (NPDES) general construction activity stormwater permit.

The specific BMPs that will be incorporated into the erosion and sediment control plan and SWPPP will be site-specific and will be prepared by the construction contractor in accordance with the California Regional Water Quality Control Board Field Manual. However, the plan likely will include, but not be limited to, one or more of the following standard erosion and sediment control BMPs.

- **Timing of construction.** The construction contractor will conduct all construction activities during the typical construction season to avoid ground disturbance during the rainy season.
- **Staging of construction equipment and materials.** To the extent possible, equipment and materials will be staged in areas that have already been disturbed.

- **Minimize soil and vegetation disturbance.** The construction contractor will minimize ground disturbance and the disturbance/destruction of existing vegetation. This will be accomplished in part through the establishment of designated equipment staging areas, ingress and egress corridors, and equipment exclusion zones prior to the commencement of any grading operations.
- **Stabilize grading spoils.** Grading spoils generated during the construction will be temporarily stockpiled in staging areas. Silt fences, fiber rolls, or similar devices will be installed around the base of the temporary stockpiles to intercept runoff and sediment during storm events. If necessary, temporary stockpiles may be covered with an appropriate geotextile to increase protection from wind and water erosion.
- **Install sediment barriers.** The construction contractor may install silt fences, fiber rolls, or similar devices to prevent sediment-laden runoff from leaving the construction area. Natural/biodegradable erosion control measures (i.e., coir rolls, straw wattles or hay bales) will be used. Plastic monofilament netting (erosion control matting) will not be allowed because animals can become caught in this type of erosion control material.
- **Stormwater drain inlet protection.** The construction contractor may install silt fences, drop inlet sediment traps, sandbag barriers, and/or other similar devices.
- **Permanent site stabilization.** The construction contractor will install structural and vegetative methods to permanently stabilize all graded or otherwise disturbed areas once construction is complete. Structural methods may include the installation of biodegradable fiber rolls and erosion control blankets. Vegetative methods may involve the application of organic mulch and tackifier and/or the application of an erosion control seed mix. Implementation of a SWPPP will substantially minimize the potential for project-related erosion and associated adverse effects on water quality.

Conservation Measure 10: Prepare and Implement a Bentonite Slurry Spill Contingency Plan (Frac-Out Plan)

Before excavation begins, SBFCA will ensure the contractor will prepare and implement a bentonite slurry spill contingency plan (BSSCP) for any excavation activities that use pressurized fluids (other than water). The plan will be subject to approval by the Corps, Service, and SBFCA before excavation can begin. The BSSCP will include measures intended to minimize the potential for a frac-out (short for "fracture-out event") associated with excavation and tunneling activities; provide for the timely detection of frac-outs; and ensure an organized, timely, and "minimum-effect" response in the event of a frac-out and release of excavation fluid (i.e., bentonite). The BSSCP will require, at a minimum, the following measures.

- 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).
- NMFS, the Service, 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.
- If the bentonite fluid congeals, no other actions, such as disturbance of the streambed, will be taken that will potentially suspend sediments in the water column.
- The site supervisor has overall responsibility for implementing this BSSCP. The site supervisor will be notified immediately when a frac-out is detected. The site supervisor will be responsible for ensuring that the biological monitor is aware of the frac-out, coordinating personnel, response, cleanup, regulatory agency notification and coordination to ensure proper clean-up, disposal of recovered material, and timely reporting of the incident. The site supervisor will ensure all waste materials are properly containerized, labeled, and removed from the site to an approved Class II disposal facility by personnel experienced in the removal, transport, and disposal of drilling mud.
- The site supervisor will be familiar with the contents of this BSSCP and the conditions of approval under which the activity is permitted to take place. The site supervisor will have the authority to stop work and commit the resources (personnel and equipment) necessary to implement this plan. The site supervisor will ensure that a copy of this plan is available (onsite) and accessible to all construction personnel. The site supervisor will ensure that all workers are properly trained and familiar with the necessary procedures for response to a frac-out, prior to commencement of excavation operations.

Conservation Measure 11: Prepare and Implement a Spill Prevention, Control, and Counter-Measure Plan

A spill prevention, control, and counter-measure plan (SPCCP) is intended to prevent any discharge of oil into navigable water or adjoining shorelines. SBFCA or its contractor will develop and implement an SPCCP to minimize the potential for and effects from spills of hazardous, toxic, or petroleum substances during construction and operation activities. The SPCCP will be completed before any construction activities begin. Implementation of this measure will comply with State and Federal water quality regulations. The SPCCP will describe spill sources and spill pathways in addition to the actions that will be taken in the event of a spill (e.g., an oil spill from engine refueling will be immediately cleaned up with oil absorbents). The SPCCP will outline descriptions of containments facilities and practices such as doubled-walled tanks, containment berms, emergency shut-offs, drip pans, fueling procedures and spill response kits. It will also describe how and when employees are trained in proper handling procedure and spill prevention and response procedures.

SBFCA will review and approve the SPCCP before onset of construction activities and routinely inspect the construction area to verify that the measures specified in the SPCCP are properly implemented and maintained. SBFCA will notify its contractors immediately if there is a non-compliance issue and will require compliance.

The Federal reportable spill quantity for petroleum products, as defined in 40 CFR 110, is any oil spill that results in one or more of the following.

- Violates applicable water quality standards.
- Causes a film or sheen on or discoloration of the water surface or adjoining shoreline.
- Causes a sludge or emulsion to be deposited beneath the surface of the water or adjoining shorelines.

If a spill is reportable, the contractor's superintendent will notify SBFCA, and SBFCA will take action to contact the appropriate safety and cleanup crews to ensure that the SPCCP is followed. A written description of reportable releases must be submitted to the Central Valley RWQCB. This submittal must contain a description of the release, including the type of material and an estimate of the amount spilled, the date of the release, an explanation of why the spill occurred, and a description of the steps taken to prevent and control future releases. The releases will be documented on a spill report form.

Conservation Measure 12: Conduct Preconstruction Surveys and Monitoring for Giant Garter Snake

Prior to ground-disturbing activities within 200 feet of suitable habitat, a Service-approved biological monitor will conduct a preconstruction survey of suitable aquatic and upland habitat and inspect exclusion and orange barrier fencing to ensure they are both in good working order each morning. If any snakes are observed within the construction area at any other time during construction the Service-approved biological monitor will be contacted to survey the site for giant garter snakes. The biological monitor will have the authority to stop construction activities until appropriate corrective measures have been completed or it is determined that the snake will not be harmed. Giant garter snakes encountered during construction activities will be allowed to move away from construction activities on their own. If unable to move away on their own, trapped or injured giant garter snakes will be only be removed by a biologist with a federal 10(a)1(a) permit which allows them to handle the snake and will be placed in a location determined through discussions with the Service. The biological monitor will immediately report the finding of a snake to Service by phone and will provide a written account of the details of the incident within 24 hours.

Once all initial ground-disturbing activities are completed, the biological monitor will perform weekly checks of the site for the duration of construction in order to ensure that construction barrier fences and exclusion fences are in good order, trenches are being covered, project personnel are conducting checks beneath parked vehicles prior to their movement, and that all other required biological protection measures are being complied with. The biological monitor will document the results of monitoring on construction monitoring log sheets, which will be provided to the Service within 1 week of each monitoring visit.

Conservation Measure 13: Provide Escape Ramps or Cover Open Trenches at the End of Each Day

To avoid entrapment of giant garter snake, thereby preventing injury or mortality resulting from falling into trenches, all excavated areas more than 1 foot deep will be provided with one or more escape ramps constructed of earth fill or wooden planks at the end of each workday. If escape ramps cannot be provided, then holes or trenches will be covered with plywood or other hard material. The biological monitor or construction personnel designated by the contractor will be responsible for thoroughly inspecting trenches for the presence of giant garter snakes at the beginning of each workday. Capture and relocation of trapped or injured individuals can only be attempted by personnel or individuals with current Service recovery permits pursuant to section 10(a)1(A) of the Act.

Conservation Measure 14: Implement Additional Protective Measures during Work in Suitable Habitat during the Giant Garter Snake Dormant Period

SBFCA will implement additional protective measures during time periods when work must occur during the giant garter snake dormant period (October 2–April 30), when snakes are more vulnerable to injury and mortality. It is expected that these additional measures will be implemented during levee slope flattening within the Sutter-Butte Canal in Reaches 26–28 (scheduled for 2016) and pipe reconstruction adjoining the canal at two sites in the same reaches during February–March, and if construction activities extend to the period between October 2 and November 1. SBFCA will implement additional protective measures when conducting work in suitable giant garter snake habitat between October 2 and April 30.

- A full-time Service-approved biological monitor will be onsite for the duration of construction activities.
- All emergent vegetation within the Sutter-Butte Canal on the levee side, and vegetation within 200 feet of the canal will be cleared prior to the giant garter snake hibernation period (i.e., vegetation clearing must be completed by October 1 for following winter work).
- Exclusion fencing will be installed around the perimeter of the work area and across the Sutter-Butte Canal where construction activities associated with levee slope flattening and pipe reconstruction activities will occur. The fencing should enclose the work area to the maximum extent possible to prevent giant garter snakes from entering the work area. Fencing will be installed during the active period for giant garter snakes (May 1–October 1) to reduce the potential for injury and mortality during fence installation. The Service-approved biological monitor will work with the contractor to determine where fencing should be placed and will monitor fence installation. The exclusion fencing will consist of 3-foot-tall erosion fencing buried 4– 6 inches below ground level. The exclusion fencing will minimize opportunities for giant garter snake hibernation in the adjacent upland area (between canal and existing levee).
- Portions of the Sutter-Butte Canal that are temporarily disturbed during construction will be revegetated with emergent vegetation and adjacent disturbed upland habitat will be revegetated with native grasses and forbs after construction is complete.

Conservation Measure 15: Restore Temporarily Disturbed Aquatic and Upland Habitat to Pre-Action Conditions

Upon completion of the proposed project, SBFCA will restore 42.52 acres of suitable aquatic habitat and 118.80 acres of suitable upland habitat for the giant garter snake to pre-project conditions. Restoration of aquatic vegetation and annual grassland will be detailed in a mitigation and monitoring plan that will be reviewed and approved by the Corps and Service prior to the start of construction. Habitat will be restored within one season (defined as May 1–October 1) and providing vegetative cover within 1 year of construction beginning in that area.

Conservation Measure 16: Compensate for Permanent Loss of Aquatic Habitat for Giant Garter Snake

SBFCA will compensate for the permanent loss of 0.004 acre of suitable aquatic habitat for giant garter snake by purchasing preservation credits equal to 0.012 acre of giant garter snake habitat at Westervelt Ecological Services' Sutter Basin Conservation Bank in Sutter County. This bank has available giant garter snake credits and is approved by both the Service and CDFW.

The 0.012 acre of habitat at the conservation bank will be protected in perpetuity for giant garter snake. Prior to the start of construction (excluding Reach 13, as there is no giant garter snake habitat in this reach), SBFCA will provide funding to Westervelt Ecological Services for preservation credits equivalent to 0.012 acre of giant garter snake habitat at the Sutter Basin Conservation Bank. The transaction will take place through a purchase and sale agreement, and funds must be transferred within 30 days, and before any construction activities are initiated. SBFCA will provide the Service and CDFW with copies of the credit sale agreement and fund transfer.

Analytical Framework for the Jeopardy Analysis

In accordance with policy and regulation, the jeopardy analysis in this biological opinion relies on four components: (1) the *Status of the Species*, which evaluates the beetle's and snake's range-wide condition, the factors responsible for that condition, and their survival and recovery needs; (2) the *Environmental Baseline*, which evaluates the condition of the beetle and the snake in the action area, the factors responsible for that condition, and the relationship of the action area to the survival and recovery of the beetle and snake; (3) the *Effects of the Action*, which determines the direct and indirect impacts of the proposed federal action and the effects of any interrelated or interdependent activities on the beetle and snake; and (4) the *Cumulative Effects*, which evaluates the effects of future, non-Federal activities in the action area on the beetle and snake.

In accordance with policy and regulation, the jeopardy determination is made by evaluating the effects of the proposed Federal action in the context of the beetle's and snake's current status, taking into account any cumulative effects, to determine if implementation of the proposed

action is likely to cause an appreciable reduction in the likelihood of both the survival and recovery of the beetle and snake.

The jeopardy analysis in this biological opinion places an emphasis on consideration of the range-wide survival and recovery needs of the beetle and snake and the role of the action area in the survival and recovery of the beetle and snake as the context for evaluating the significance of the effects of the proposed Federal action, taken together with cumulative effects, for purposes of making the jeopardy determination.

Status of the Species

Valley Elderberry Longhorn Beetle

Please refer to the *Valley Elderberry Longhorn Beetle (Desmocerus californicus dimorphus) 5-year Review: Summary and Evaluation* (Service 2006) for the current status of the species.

Giant Garter Snake

Please refer to the *Giant Garter Snake (Thamnophis gigas) 5-year Review: Summary and Evaluation* (Service 2012) for the current status of the species.

Environmental Baseline

Valley Elderberry Longhorn Beetle

The closest beetle occurrence in the CNDDB (2013) is about 0.5 mile from the proposed project. Suitable habitat for the beetle (in the form of elderberry shrubs) exists in numerous places along the 41 miles of proposed levee repair. A total of 267 elderberry shrubs were mapped within the action area. Many others exist at various locations between the levee and the river. Of these SBFCA is proposing to avoid 175 elderberry shrubs and transplant 91 elderberry shrubs. Because the action area is within the range of the species, there are known occurrences from the vicinity of the action area, and suitable habitat is present, the Service concludes that it is reasonably likely for the beetle to occupy the action area.

Giant Garter Snake

The *Draft Recovery Plan for the Giant Garter Snake* subdivides the range of the species into four recovery units (Service 1999b). The action area for the proposed project is located within the Sacramento Valley Recovery Unit. There are 20 records of the snake within 5 miles of the action area. The closest occurrence documented in the CNDDB is 2 miles from the action area. Snakes have the potential to occur within the action area because suitable aquatic and upland habitat is present as it is hydrologically connected to areas that support rice agriculture and areas where the snake has previously been detected. The action area is a long corridor that occasionally has irrigation ditches, which run parallel to the levee for limited stretches. The main threat to the snake in the action area is loss of habitat or connectivity due to channel and levee maintenance.

Effects of the Proposed Action

Valley Elderberry Longhorn Beetle

Ninety-one elderberry shrubs will be removed and transplanted. The 91 affected shrubs have 361 stems between 1 and 3 inches, 92 stems between 3 and 5 inches and 100 stems greater than 5 inches at ground level.

Loss of an elderberry shrub or even a stem can affect the beetle breeding and feeding because adult beetles rely solely on elderberry foliage and flowers for food and must lay their eggs on elderberry stems to successfully reproduce.

Transplantation of elderberry shrubs that are or could be used by beetle larvae is expected to adversely affect the beetle. Beetle larvae will be killed or the beetle's life cycle will be interrupted during or after the transplanting process. For example:

1. Transplanted elderberry shrubs may experience stress or become unhealthy due to changes in soil, hydrology, microclimate, or associated vegetation. This may reduce their quality as habitat for the valley elderberry longhorn beetle, or impair their production of habitat-quality stems in the future.

2. Elderberry shrubs may die as a result of transplantation.

3. Branches containing larvae may be cut, broken, or crushed as a result of the transplantation process.

SBFCA has proposed to transplant one shrub outside of the elderberry shrub's dormant season (November 1 to February 15). To offset the increased risk of the transplantation not being successful SBFCA has proposed to plant 2.5 times the number of elderberry seedlings at the Star Bend Conservation Area.

Temporal loss of habitat will occur. Although conservation measures for effects on the beetle will involve creation or restoration of habitat, it generally takes 5 or more years for elderberry plants to become large enough to support beetles, and it may take 25 years or longer for riparian habitats to reach their full value. Temporal loss of habitat may cause fragmentation of habitat and isolation of subpopulations.

Permanent and temporary habitat loss adversely affects the beetles breeding and foraging requirements. Habitat creation and transplantation of the shrubs will minimize these effects. Success of a restoration site has been linked to presence of transplanted elderberry shrubs that have served to colonize a newly created riparian habitat. Transplants that survive also provide diversity within the conservation area as they are older, larger shrubs within the plantings of young small elderberry seedlings. The Star Bend Conservation Area will be protected with a conservation easement and managed in perpetuity for riparian habitat including valley elderberry longhorn beetle habitat, through development of the *Feather River West Levee Project Mitigation and Monitoring Plan.*

Giant garter snake

Aquatic habitat for the snake near the levee construction varies along the 41 miles of the proposed project. Small areas of aquatic habitat are present in Contract A and C and they are hydrologically connected to areas that support habitat for the snake (rice). Contract D has the largest amount of snake aquatic habitat as the Sutter Butte Canal parallels the levee for longer lengths. Canal filling due to cutoff wall construction will permanently fill 0.004 acre of snake aquatic habitat. Upland habitat around this aquatic habitat will be temporarily disturbed but returned to pre-project condition within one year. Temporary effects will result from temporary fill of aquatic habitat for construction access, reshaping the slope of the Sutter Butte Canal and adjacent levee, and degradation and reconstruction of the levee. These activities will temporarily affect 6.81 acres of aquatic habitat. Levee degradation and reconstruction will temporarily affect 112.47 acres of upland habitat. All temporarily affected areas will be restored to pre-project conditions within the same year the disturbance will occur. This will minimize effects to giant garter snakes because the amount of time the habitat will be unavailable to the snake will be minimized. Permanently affected habitat, such as the canals that will be made smaller will be offset by purchasing 0.012 acre of giant garter snake habitat at Westervelt Ecological Services' Sutter Basin Conservation Bank in Sutter County. None of the borrow sites in the project description have upland or aquatic giant garter snake habitat.

The majority of the construction work will occur during the giant garter snake active season (May 1 to October 1). Increased construction activity in areas where snakes are known to occur could expose snakes to increased risks of injury and mortality from predation, exposure, vehicular traffic, and construction equipment. Because snakes are more mobile during the active season, these effects should be lessened. There are a few activities which SBFCA could not construct during the active season. Because of cooler temperatures in the inactive season (October 1 to May 1), the snake is not as mobile and is most frequently found within burrows. Ground disturbing activities during this timeframe will increase the likelihood of snake mortality when the burrows are disturbed with heavy equipment. SBFCA has proposed to disturb (clear and grub) the out of season work area and place exclusion fencing around the work area during the active season which will create an area that will not support overwintering snakes (lack of burrows). This will minimize the chance of injuring or killing an overwintering snake during out of season construction. This will only occur on one side of the canal, leaving the other side of the canal available as overwintering habitat for the snake.

Temporary effects within the action area will affect both aquatic and upland snake habitat. In some locations degradation of the levee could cause soil to fall into the aquatic habitat or fuel or oil leaks could also adversely affect the habitat and the snake. Placement of sediment fencing and implementing sediment and contaminant BMPs will lessen this effect. Levee degradation will temporarily make upland habitat unavailable to the snake during the active season. Snakes use upland habitat for thermoregulation both as a place to bask and as a place to escape extreme heat (burrows) and cover for shedding and giving birth to young. While snakes are more active during the summer months and more likely to move away from construction, some snakes may choose to remain where they are and therefore will be subject to mortality when construction activities are occurring. In addition to direct mortality, the upland habitat will be temporarily unavailable to the snake during construction. Even once construction is completed it will take a

year or two for the upland habitat to become completely functional for the snake, with burrows or crevices available for them to use. This is likely to result in disturbance, displacement, injury, and/or mortality of snakes. To lessen these effects SBFCA is implementing the conservation measures described above as well as affecting only one side of the canal. This will leave the other side of the canal intact and available to the snake for use, minimizing displacement of snakes. Additionally, because of the staging of construction not all of the upland habitat will be unavailable for use at one time. It will be staged as construction progresses through the various contracts.

Cumulative Effects

Cumulative effects include the effects of future State, Tribal, local, or private actions that are reasonably certain to occur in the action area considered in this biological opinion. Future Federal actions that are unrelated to the proposed project are not considered in this section, because they require separate consultation pursuant to section 7 of the Act. Any future land use conversions and routine agricultural practices are not subject to Federal authorization or funding and may alter the habitat or result in take of listed valley elderberry longhorn beetle or giant garter snake and are, therefore, cumulative to the proposed project.

Conclusion

After reviewing the current status of the valley elderberry longhorn beetle and giant garter snake, the environmental baselines for these species, the effects of the proposed project, and the cumulative effects on this species, it is the Service's biological opinion that the proposed FRWLP, as described herein, is not likely to jeopardize the continued existence of these species. Although critical habitat has been designated for the beetle, the proposed action will not affect critical habitat.

INCIDENTAL TAKE STATEMENT

Section 9 of the Act and Federal regulation pursuant to section 4(d) of the Act prohibit the take of endangered and threatened species, respectively, without special exemption. Take is defined as harass, harm, pursue, hunt, shoot, wound, kill, trap, capture or collect, or to attempt to engage in any such conduct. Harass is defined by the Service as an intentional or negligent act or omission which creates the likelihood of injury to a listed species by annoying it to such an extent as to significantly disrupt normal behavioral patterns which include, but are not limited to, breeding, feeding or sheltering. Harm is defined by the Service to include significant habitat modification or degradation that results in death or injury to listed species by impairing behavioral patterns including breeding, feeding, or sheltering. Incidental take is defined as take that is incidental to, and not the purpose of, the carrying out of an otherwise lawful activity. Under the terms of section 7(b)(4) and section 7(o)(2), taking incidental to and not intended as part of the agency action is not considered to be prohibited taking under the Act, provided that such taking is in compliance with this Incidental Take Statement.

The measures described below are nondiscretionary for listed species of this biological opinion and must be implemented by the Corps and SBFCA in order for the exemption in section 7(o)(2)

to apply. The Corps has a continuing duty to regulate the activity that is covered by this incidental take statement. If the Federal agency (1) fails to adhere to the terms and conditions of the incidental take statement, and/or (2) fails to retain oversight to ensure compliance with these terms and conditions, the protective coverage of section 7(o)(2) may lapse.

Amount or Extent of Take

Valley Elderberry Longhorn Beetle

The Service expects that incidental take of the valley elderberry longhorn beetle will be difficult to detect or quantify. The cryptic nature of this species and their relatively small body size make the finding of an injured or dead specimen unlikely. The species occurs in habitats that make them difficult to detect. Due to the difficulty in quantifying the number of beetles that will be taken as a result of the proposed action, the Service is quantifying take incidental to the project as the number of elderberry stems one inch or greater in diameter at ground level (beetle habitat) that will become unsuitable for beetles due to direct or indirect effects as a result of levee construction. Therefore, the Service estimates that all beetles inhabiting 91 elderberry plants containing stems 1 inch or greater at ground level (361 stems between 1-3 inches, 92 stems between 3 and 5 inches and 100 stems $\geq$5 inches; see Table 1 in the text) will be taken as a result of the proposed action.

Giant Garter Snake

The Service anticipates that incidental take of the snake will be difficult to detect or quantify for the following reasons: the snake is cryptically colored, secretive, and known to be sensitive to human activities. Snakes may avoid detection by retreating to burrows, soil crevices, vegetation, or other cover. Individual snakes are difficult to detect unless they are observed, undisturbed, at a distance. Most close-range observations represent chance encounters that are difficult to predict. It is not possible to make an accurate estimate of the number of snakes that will be harassed, harmed or killed during construction activities (staging areas, work on canal banks, levee degradation and reconstruction, soil borrow areas, and vehicle traffic to and from borrow areas). In instances when take is difficult to detect, the Service may use the quantification of acreage as a surrogate for the individuals that will be taken. Therefore, the Service anticipates take incidental to this project as the 0.004 acre of suitable habitat that will be permanently lost and the 119.28 acres (6.81 acres aquatic and 112.47 acres upland) of suitable snake habitat that will be temporarily lost. Upon implementation of the Reasonable and Prudent Measure, Terms and Conditions, and the Proposed Conservation Measures considered herein, incidental take within this acreage for the proposed project, will be exempt from the prohibitions described under Section 9 of the Act.

Effect of the Take

The Service has determined that this level of anticipated take is not likely to result in jeopardy to the beetle or snake.

Reasonable and Prudent Measures

The Service has determined that the following reasonable and prudent measure is necessary and appropriate to minimize the adverse effects of the Feather River West Levee Project to the beetle and snake and their habitat in the action area.

Terms and Conditions

In order to be exempt from the prohibitions of section 9 of the Act, the Corps and SBFCA must ensure compliance with the following terms and conditions, which implement the reasonable and prudent measures described above. These terms and conditions are nondiscretionary.

The following Terms and Conditions implement the Reasonable and Prudent Measure:

1. All the conservation measures as described in the project description, and as restated here in this biological opinion, must be fully implemented and adhered to.

2. The Corps, SBFCA, and PG&E shall include full implementation and adherence to the conservation measures as outlined in the biological opinion as a condition of any permit or contract issued for the project.

3. In order to monitor whether the amount or extent of take anticipated from implementation of the proposed project is approached or exceeded, the Corps and SBFCA shall adhere to the following reporting requirement. Should this anticipated amount or extent of incidental take be exceeded, the Corps must immediately reinitiate formal consultation as per 50 CFR 402.16.

    a. For those components of the proposed project that will result in habitat degradation or modification whereby incidental take in the form of harm or mortality is anticipated, the Corps and SBFCA will provide weekly updates to the Service with a precise accounting of the total acreage of habitat effected or number of elderberry shrubs and size of stems at ground level transplanted. Updates shall also include any information about changes in the Project Description and not analyzed in this biological opinion.

4. SBFCA shall provide a photo documentation report showing pre- and post-project area conditions for giant garter snake.

Salvage and Disposition of Individuals

The Sacramento Fish and Wildlife Office will be notified within 1 day of the finding of any dead or injured snake or beetle to determine the appropriate measures for salvage and disposition. The Service contact person is the Habitat Conservation Division Chief. In addition, the Recovery Division Chief shall also be notified within 1 day of the procedures implemented for salvage and disposition of the snake or beetle. The applicant must report to the Service immediately any information about take or suspected take of listed species not authorized in this biological

opinion. Notification must include the date, time, and location of the incident or of the finding of a dead or injured listed species. The Habitat Conservation and Recovery Divisions Chiefs can be contacted at (916) 414-6600. The California Department of Fish and Wildlife should also be contacted at (916)358-2900.

CONSERVATION RECOMMENDATIONS

Conservation recommendations are suggestions of the Service regarding discretionary measures to minimize or avoid adverse effects of a proposed action on listed species or critical habitat or regarding the development of new information. These measures may serve to further minimize or avoid the adverse effects of a proposed action on listed, proposed, or candidate species, or on designated critical habitat. They may also serve as suggestions on how action agencies can assist species conservation in furtherance of their responsibilities under section 7(a)(1) of the Act, or recommend studies improving an understanding of a species' biology or ecology. Wherever possible, conservation recommendations should be tied to tasks identified in recovery plans. The Service is providing you with the following conservation recommendations:

1. The Corps and SBFCA should assist in the implementation of the draft, and when published, the final Recovery Plan for the snake.

2. The Corps and SBFCA should provide funding to researchers studying topics identified by the Service in the draft, and when published, the final Recovery Plan for the snake.

3. The Corps should use environmental restoration authorities to acquire and restore beetle and snake habitat.

To be kept informed of actions minimizing or avoiding adverse effects or benefiting listed and proposed species or their habitats, the Service requests notification of the implementation of any conservation recommendations.

REINITIATION - CLOSING STATEMENT

This concludes formal consultation with the Corps on the Feather River West Levee Project. As provided in 50 CFR 402.16, re-initiation of formal consultation is required where discretionary Federal agency involvement or control over the action has been maintained (or is authorized by law) and if: (1) the amount or extent of incidental take is exceeded; (2) new information reveals effects of the proposed action may affect listed species or critical habitat in a manner or to an extent not considered in this opinion; (3) the agency action is subsequently modified in a manner that causes an effect to listed species or critical habitat that was not considered in this opinion; or (4) a new species or critical habitat is designated that may be affected by the proposed action. In instances where the amount or extent of incidental take is exceeded, any operations causing such take must cease pending re-initiation.

If you have any questions regarding this Feather River West Levee Project biological opinion, please contact Jennifer Hobbs, at (916) 414-6541 or Doug Weinrich, Deputy Assistant Field Supervisor, at (916) 414-6563.

Sincerely,

for Jan C. Knight
Acting Field Supervisor

cc:
Jeff Koschak, Corps, Sacramento, CA
Jenny Marr, CDFW, Chico, CA
Jennifer Haire, ICF, Sacramento, CA

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PROGRAMMATIC AGREEMENT
AMONG THE
U.S. ARMY CORPS OF ENGINEERS, SUTTER BUTTE FLOOD CONTROL AGENCY, AND
THE CALIFORNIA STATE HISTORIC PRESERVATION OFFICER
REGARDING THE
FEATHER RIVER WEST LEVEE PROJECT
SUTTER AND BUTTE COUNTIES, CALIFORNIA

WHEREAS, the Sutter Butte Flood Control Agency (SBFCA) proposes to design and construct the Feather River West Levee Project (Project), to reduce flood risk in the Sutter Basin, which includes portions of Sutter and Butte Counties in the Sacramento Valley of California, and;

WHEREAS, this project requires permits from the U.S. Army Corps of Engineers (Corps) to modify federal levees under Section 14 of the River and Harbors Act (33 US Code Section 408) and a permit to discharge fill to waters of the United States under Section 404 of the Clean Water Act (33 US Code Section 1344), and;

WHEREAS, the project is an undertaking as defined under Section 106 of the National Historic Preservation Act (NHPA, 16 US Code Section 470f) and the implementing regulations (33 CFR Section 800.16[y]) because the project requires federal permitting, and;

WHEREAS, the Corps is the lead federal agency for Section 106 compliance per 36 CFR Section 800.2(a)(2) for the project, and;

WHEREAS, the Corps may not be able to resolve adverse effects by preparing a Memorandum of Agreement under 36 CFR Section 800.2(a)(2) in advance of 408 authorization and 404 permitting; and;

WHEREAS, the Section 106 regulations allow a federal agency to phase identification and evaluation of historic properties if provided for in a programmatic agreement (36 CFR Section 800.4(b)(2)), and;

WHEREAS, the Corps has consulted with and will continue to consult with both federally recognized and other Native American tribes, and the public, and;

WHEREAS, the Corps has provided notice to the Advisory Council on Historic Preservation (ACHP) and by letter dated July 18, 2012, the ACHP has declined to participate in this programmatic agreement (Agreement), and;

WHEREAS, the Corps has consulted with the State Historic Preservation Officer (SHPO) and will continue to consult with the SHPO and provide the SHPO the opportunity to review documents covered by this Agreement, and;

WHEREAS, SBFCA has invited the Central Valley Flood Protection Board (CVFPB) to review and participate as a concurring party to this Agreement because the CVFPB must approve alterations to the project levees per California Water Code Section 8710,

NOW THEREFORE, the Corps, SHPO, SBFCA and the Central Valley Flood Protection Board (CVFPB) agree that the following stipulations will be implemented for all portions of the project, in accordance with this Agreement and the Inventory and Historic Property Treatment Plan (Plan) that will be appended to this Agreement after execution.

STIPULATIONS

Stipulation I. Applicability and Scope, Relationship to Other Agreements

(A) Applicability, Scope, and Method of Implementation

1. This Agreement applies to the project because the project is an undertaking within the meaning of Section 106 of the NHPA, as defined in 36 CFR Section 800.16(y).

2. Although other state and local agencies may issue permits and otherwise provide assistance for portions of the project covered by this Agreement, the Corps remains the lead federal agency responsible for ensuring compliance with all Section 106 responsibilities under the provisions of this Agreement.

3. This Agreement does not negate or supersede any agreements in effect between the Corps and Indian tribes at the time the Agreement is executed, nor does it negate or supersede any agreement documents executed between the Corps and SHPO pursuant to 36 CFR Part 800, with amendments, effective August 5, 2004.

4. SBFCA assumes responsibility for the contracting and supervision of technical cultural resources management work performed to satisfy the stipulations of this Agreement and Section 106 of the NHPA. SBFCA understands that all substantive management decisions and completion of Section 106 milestones are subject to the review, approval, and ultimate discretion of the Corps.

(B) Conflicts with Other Agreement Documents

1. It is possible that a conflict may arise between this Agreement and other agreement documents that govern associated undertakings. The Corps shall endeavor to avoid conflicts with other agreement documents, but in the event of a direct conflict, the Corps shall determine which standards govern and how to proceed. For the Project, SBFCA will only be responsible for implementing the terms of this Agreement.

Stipulation II. Definitions and Standards

1. The definitions set forth at 36 CFR Section 800.16 are applicable throughout this Agreement.

2. "Plan" as used in this document, refers to the Inventory and Historic Property Treatment Plan. This document will describe methodology covering inventory methods, recording of resources, evaluation and treatment of identified resources, curation of recovered materials, and other technical specifications necessary to implement this Agreement. This Plan may be amended separately from the Agreement but cannot revise the substantive requirements of this Agreement.

3. Professional Qualifications: All inventory and evaluation activities prescribed by this Agreement shall be carried out under the authority of the Corps by or under the direct supervision of a person or persons meeting, at a minimum, the Secretary of the Interior's Professional Qualifications Standards (48 FR 44738–44739) in the appropriate disciplines. Nothing in this stipulation, however, may be interpreted to preclude the Corps, SBFCA, or any agent or contractor thereof from using the services of persons who do not meet the Secretary of Interior's Professional Qualifications Standards if they are supervised by an individual who does meet these standards.

Stipulation III. Notices and Communications

(A) Methods of Transmittal

1. The signatory parties agree that reports and deliverables such as inventory reports, findings of effect, and treatment plans may be submitted electronically to signatory parties for review. All decisions from SHPO, such as concurrence in evaluations, findings of effect, and adequacy of treatment, shall be delivered in hard copy and retained by SBFCA and the Corps.

Stipulation IV. Identification of Historic Properties

(A) Phasing of Identification, Evaluation, Determination of Adverse Effects, and Resolution of Adverse Effects on Historic Properties

1. The Corps will perform, or ensure that SBFCA performs, the following steps for discrete phases or activities identified by SBFCA and the Corps, according to the construction schedule or timeline of the larger project.

2. For each phase or activity, the Corps and SBFCA shall define an area of potential effects (APE), complete an inventory of the APE, evaluate identified resources for the National Register of Historic Places (NRHP), make a finding of effect, and develop treatment methods to resolve adverse effects. The Corps will typically submit separate reports for the inventory (including evaluation and findings of effect) and treatment. For example, where identified properties require property-specific treatment that requires consideration and collaboration among consulting parties, the Corps would typically submit the inventory, evaluation, and finding of effect for the APE in one report and submit treatment in a separate later deliverable. All reports prepared under this stipulation shall be subject to the review and approval requirements defined below as part of this stipulation (IV[F]).

(B) Definition of the Area of Potential Effects for Each Phase or Activity

1. The Corps has conducted initial consultation with the SHPO regarding the APE. For each activity or phase dependent on federal authorization or permits from the Corps, the Corps and SBFCA shall define a phase-specific APE, in consultation with the SHPO. The APE shall consist of the construction footprint and any ancillary areas, including but not limited to staging areas, haul roads, utility relocations, and mitigation sites for each phase or activity identified by SBFCA, as well as the surrounding vicinity where the phase-specific footprint may result in direct or indirect effects on historic properties, based upon the nature of the activity and the potentially affected resources, subject to the review and approval of the Corps prior to initiation of cultural resource inventories. The APE will determine the location where the

Corps shall conduct inventory efforts, evaluate identified resources, make a finding of effect, and develop treatment as defined below (Stipulation IV[C] through IV[E]).

(C) Inventory of the Area of Potential Effects

1. The Corps and SBFCA, in consultation with the SHPO and any interested Native American tribes, shall complete an inventory of cultural resources within each phase or activity-specific APE. The inventory shall use efforts appropriate to the kind and frequency of cultural resources that may be encountered, consistent with the methodology of the plan. The inventory will cover the entire APE and shall be designed to identify historic properties prior to construction, to the extent feasible.

2. Based upon the inventory of each phase or activity-specific APE, the Corps may require construction monitoring. The Corps' decision shall be based upon relevant factors such as the density and distribution of identified resources, geomorphology, recommendations from Native Americans (including both federally recognized tribes and other individuals and organizations), historic maps, and other data. Monitoring efforts shall conform to the requirements of the plan with any necessary modifications made based upon the results of the inventory effort.

(D) Evaluation and Finding of Effect

1. For all identified cultural resources, the Corps and SFBCA shall prepare an evaluation for the NRHP, consistent with the methods and standards in the Plan. The Corps shall apply the criteria for evaluation for the NRHP provided in 36 CFR Section 60.4. The Corps and SBFCA shall also include a finding of effect in the inventory and evaluation report, or in a separate deliverable, by applying the criteria of adverse effect in 36 CFR Section 800.5(a)(1).

(E) Resolution of Adverse Effects

1. For all identified historic properties that would be adversely affected by the project, the Corps and SBFCA shall develop treatments to resolve adverse effects. Treatment may consist of avoidance, documentation, data recovery excavations, preservation in place, or other methods identified by the Corps. The Corps may use treatment methods provided in the Plan or may develop, in consultation with the SHPO, interested Native American tribes, or other stakeholders as appropriate, property-specific treatment. If treatment methods described in the Plan are adequate, the Corps may simply refer to those methods in the inventory report, finding of effect document, or stand-alone treatment plan and incorporate them by reference without repeating the full text of the relevant treatment methods.

(F) Review of Reports

1. Reports describing the results of inventory, evaluation, findings of effect and proposed treatment shall be submitted to the SHPO for review. The Corps shall also distribute reports to signatories, concurring parties, and other interested parties upon request. SHPO and other reviewing parties shall have 30 calendar days to review reports, starting on the day the report is transmitted electronically or the date it was received if sent by mail or other physical means. If SHPO does not respond within 30 calendar days, the Corps may proceed with the proposed actions. If SHPO responds with comments, the Corps shall incorporate the comments and provide a revised copy to SHPO and other consulting parties for further review. The SHPO shall have 15 calendar days from the date the revised report is received to review

revised reports prepared under this stipulation. If the SHPO does not respond within this time frame, the Corps may implement the proposed actions in the report and construction dependent upon those findings, if any.

2. Every report and associated management milestone performed under this stipulation shall be deemed complete and adequate when the SHPO provides written concurrence by e-mail or letter.

(G) Ongoing Consultation with Native American Individuals and Organizations

1. The Corps has consulted with the Native American community during development of this Agreement document. During management milestones, such as completion of inventory reports, resource evaluations, findings of effect, and development and implementation of treatment, the Corps shall consult with the Native American individuals and organizations that may attach cultural significance to resources affected by relevant undertakings. The Corps will consider the results of these consultations and attempt to incorporate and follow suggestions regarding management of cultural resources.

(H) Annual Reports

1. At the end of every calendar year during which management activities are performed under this Agreement, SBFCA and the Corps shall prepare and deliver to the SHPO a memorandum summarizing management activities and findings for that calendar year.

Stipulation V. Monitoring and Inadvertent Discoveries and Unanticipated Effects

(A) Workforce Training and Construction Monitoring

1. The Corps or qualified archaeologists retained by SBFCA will provide training to construction personnel regarding proper procedures and conduct in the event that archaeological materials are encountered during construction. This training will cover both the identification of resources that may be encountered during construction and procedures to be followed in the event of a discovery.

2. SBFCA shall conduct monitoring of construction where the Corps, in consultation with the SHPO, determines it is necessary to ensure that identified resources are protected or where there is a high sensitivity for previously unidentified resources. These determinations will be described in each phase or activity-specific inventory report and the plan.

(B) Discovery Procedures for Resources Encountered During Construction

1. If cultural resources are discovered during construction, all construction shall immediately stop within 100 ft (30 m) of the discovery, the location of the discovery will be marked for avoidance, and efforts will be made to prevent inadvertent destruction of the find. The contractor must notify the Corps and SBFCA (if no Corps or SBFCA representatives are on location). The Corps shall determine whether the discovery is a potential NRHP-eligible resource per the criteria in 36 CFR Section 60.4. If the Corps determines that the discovery is not a potentially NRHP-eligible resource, the discovery will be documented and construction may proceed at the direction of the Corps.

2. If the Corps determines that human remains have not been encountered, that the discovery is not an isolated find, and that the discovery may be eligible for the NRHP, the Corps will notify the SHPO and other relevant parties within 48 hours of the discovery. Notification should include a description of the discovery, the circumstances leading to its identification, and recommendations for further action. Where feasible, the notification will also include a tentative NRHP-eligibility discussion per 36 CFR Section 60.4 and a finding of effect per 36 CFR Section 800.5(a)(1). If the resource cannot be evaluated based upon available evidence (for example, where test excavation is required), the Corps shall include a plan of action for further technical work necessary to determine the eligibility of the resource and make a finding of effect per 36 CFR Section 800.5(a)(1). Treatment shall be implemented where necessary to resolve adverse effects on inadvertently discovered historic properties. If treatment is necessary to resolve adverse effects, SBFCA and the Corps shall consult with Native American individuals and organizations that attach cultural significance to the relevant historic properties and with the SHPO prior to implementing treatment. The SHPO shall have 15 calendar days to review findings of effect and treatment plans submitted under this stipulation, when treatment is selected from the attached historic property treatment plan. When new treatment methods are developed, review shall follow Stipulation IV(F) above.

3. If human remains are present, treatment shall conform to the requirements of state law under California Health and Safety Code Section 7050.5 and Public Resources Code Section 5097.98, unless the discovery occurs on federal land. Discoveries on federal land shall conform to the requirements of the Native American Graves Protection and Repatriation Act (NAGPRA, 25 US Code Section 3001 et seq.), after complying with the requirements of California Health and Safety Code Section 7050.5, which requires notice to the County Coroner so the coroner may determine if an investigation into the cause of death is required. These legal requirements, as well as appropriate monitoring, will be described in the plan, as indicated in Attachment 2.

Stipulation VI. Administrative Provisions

(A) Documentation Standards

1. Written documentation of inventory, evaluations, findings of effect and treatment prescribed per this Agreement shall conform to the Secretary of the Interior's Standards and Guidelines for Archeology and Historic Preservation (48 FR 44716–44740), as well as to applicable standards and guidelines established by the State of California Office of Historic Preservation[1] and the plan for each phase, agreed upon by the Corps and the SHPO, in consultation with all pertinent stakeholders.

(B) Curation Standards

1. The Corps shall ensure that the materials and records resulting from the activities prescribed in this Agreement are curated in accordance with 36 CFR Part 79, except where state law and regulations, including, but not limited to, California Public Resources Code Sections 5097.98 and 5097.991 for Native American human remains and associated grave goods discovered on non-federal land, require different treatment. Non-burial associated archaeological materials removed from private land shall be subject to the control of the landowner. Additionally, the disposition of any abandoned shipwrecks and

[1]California State Parks, Office of Historic Preservation, *Publications and Forms.* Available: http://ohp.parks.ca.gov/?page_id=1069, Accessed March 5, 2013.

archaeological sites and historic resources on state lands under the jurisdiction of the California State Lands Commission (CSLC) shall be determined by CSLC as provided by California Public Resources Code Section 6313. The Corps will ensure that, to the extent permitted by applicable laws and regulations, the views of the appropriate Native American descendant group(s) are taken into consideration when decisions are made about the disposition of Native American archaeological materials and records.

(C) Confidentiality

1. The signatory parties to this Agreement acknowledge that historic properties covered by this Agreement are subject to the provisions of Section 304 of the NHPA and California Government Code 6254.10 (Public Records Act) relating to the disclosure of archaeological site information and, having so acknowledged, will ensure that all actions and documentation prescribed by this Agreement maintain the confidentiality required by law.

Stipulation VII. Resolving Objections

(A) Resolving Objections

1. Should any party to this Agreement object in writing at any time to the manner in which the terms of this Agreement are implemented, to any action carried out or proposed with respect to implementation of the Agreement (other than the undertaking itself), or to any documentation prepared in accordance with and subject to the terms of this Agreement, the Corps shall immediately notify the other Agreement parties of the objection, request their comments on the objection within 15 days following receipt of the Corps' notification, and proceed to consult with the objecting party for no more than 30 days to resolve the objection. The Corps will honor the request of the other parties to participate in the consultation and will take any comments provided by those parties into account.

2. If the objection is resolved during the 30-day consultation period, the Corps may proceed with the disputed action in accordance with the terms of such resolution.

3. If at the end of the 30-day consultation period, the Corps determines that the objection cannot be resolved through such consultation, then the Corps shall forward all documentation relevant to the objection to the ACHP, including the Corps' proposed response to the objection, with the expectation that the ACHP will, within 45 days after receipt of such documentation:

a. Advise the Corps that the ACHP concurs in the Corps' proposed response to the objection, whereupon the Corps will respond to the objection accordingly. The objection shall thereby be resolved; or

b. Provide the Corps with recommendations, which the Corps will take into account in reaching a final decision regarding its response to the objection. The objection shall thereby be resolved; or

c. Notify the Corps that the objection will be referred for comment pursuant to 36 CFR Section 800.7(c) and proceed to refer the objection and comment. The Corps shall take the resulting comments into account in accordance with 36 CFR Section 800.7(c)(4). The objection shall thereby be resolved.

4. Should the ACHP not exercise one of the above options within 45 days after receipt of all pertinent documentation, the Corps may proceed to implement its proposed response. The objection shall thereby be resolved.

5. The Corps shall take into account any of the ACHP's recommendations or comments provided in accordance with this stipulation with reference only to the subject of the objection. The Corps' responsibility to carry out all actions under this Agreement that are not the subject of the objection shall remain unchanged.

6. At any time during implementation of the measures stipulated in this Agreement, should a member of the public raise an objection in writing pertaining to such implementation to any signatory party to this Agreement, that signatory party shall immediately notify the Corps. The Corps shall immediately notify the other signatory parties in writing of the objection. Any signatory party may choose to comment in writing on the objection to the Corps. The Corps shall establish a reasonable time frame for this comment period. The Corps shall consider the objection, and in reaching its decision, the Corps will take all comments from the other signatory parties into account. Within 15 days following closure of the comment period, the Corps will render a decision regarding the objection and respond to the objecting party. The Corps will promptly notify the other signatory parties of its decision in writing, including a copy of the response to the objecting party. The Corps' decision regarding resolution of the objection will be final. Following issuance of its final decision, the Corps may authorize the action subject to dispute hereunder to proceed in accordance with the terms of that decision.

7. The Corps shall provide all parties to this Agreement, and the ACHP, if the ACHP has commented, and any parties that have objected pursuant to Section C.6 of this stipulation, with a copy of its final written decision regarding any objection addressed pursuant to this stipulation.

8. The Corps may authorize any action subject to objection under this stipulation to proceed after the objection has been resolved in accordance with the terms of this stipulation.

Stipulation VIII. Amendments

(A) Methods for Amending this Agreement

1. Any signatory party to this Agreement may propose that this Agreement be amended, whereupon the signatory parties will consult for no more than 30 calendar days to consider such amendment. The Corps may extend this consultation period. The amendment process shall comply with 36 CFR Section 800.6(c)(1) and Section 800.6(c)(7). This Agreement may be amended only upon the written agreement of the signatories.

(B) Failure to Reach Agreement

1. If the signatory parties cannot reach agreement on proposed amendments, the dispute shall be resolved as provided for in Stipulation VII above.

Stipulation IX. Termination

(A) Power to Terminate

1. Only signatory parties to this Agreement may terminate this Agreement. If this Agreement is not amended as provided for in Stipulation VIII or if any signatory proposes termination of this Agreement, the party proposing termination shall notify the other signatory parties in writing, explain the reasons for proposing termination, and consult with the other parties for no more than 30 calendar days to seek alternatives to termination.

2. Should such consultation result in an agreement on an alternative to termination, the signatories shall proceed in accordance with that agreement and if necessary, shall amend this document in accordance with Stipulation VIII.

3. Should such consultation fail to result in an agreed-upon resolution by the signatory parties, the signatory party proposing termination may terminate this Agreement by promptly notifying the other signatories in writing.

4. If this Agreement is terminated hereunder, and if the Corps determines that the undertaking will nonetheless proceed, then the Corps shall comply with the requirements of 36 CFR Section 800.3–800.6, or request the comments of the ACHP, pursuant to 36 CFR Part 800.

Stipulation X. Duration of the Agreement

1. Unless it is terminated pursuant to Stipulation IX of this Agreement or superseded by another agreement executed for the covered undertakings, this Agreement shall remain in effect until the Corps, in consultation with the other signatory parties to this Agreement, determines that construction, monitoring, and maintenance of all aspects of the undertakings have been completed and all terms of this Agreement have been fulfilled in a satisfactory manner, or until 10 years have passed from the date of execution of this Agreement, whichever comes first. Upon a determination by the Corps that construction, monitoring, and maintenance of all aspects of the covered undertakings have been completed and that all terms of this Agreement have been fulfilled in a satisfactory manner, or upon reaching the 10 year limit, the Corps shall notify the other signatory and concurring parties of this determination in writing, whereupon this Agreement shall be null and void.

Stipulation XI. Effective Date

1. This Agreement shall take effect on the date that it has been executed by all signatory parties.

EXECUTION and implementation of this Agreement is evidence that the Corps has afforded ACHP a reasonable opportunity to comment on this Agreement and the associated undertakings; that the Corps has taken into account the effects of the undertakings on historic properties; and that the Corps has complied with Section 106 of the NHPA and 36 CFR Part 800 for all relevant aspects of the undertaking.

ATTACHMENTS AND FIGURES

Figures 1 and 2, Project Location and Project Area

Attachment 1. Feather River West Levee Project: Description of the Project and U.S. Army Corps of Engineers Undertakings

Attachment 2. Feather River West Levee Project: Outline and Guidance for the Historic Property Treatment Plan

SIGNATORY PARTIES:

U.S. Army Corps of Engineers

By _____ Date 22 MAY 2013
William J. Leady, P.E.
Colonel, U.S. Army
District Commander

California State Office of Historic Preservation

By _____ Date 7-1-13
Carol Roland-Nawi, PhD
State Historic Preservation Officer

Sutter Butte Flood Control Agency

By _____ Date 6/14/13
Michael Inamine
Interim Executive Director
Sutter Butte Flood Control Agency

CONCURRING PARTIES:

Central Valley Flood Protection Board

By _____ Date _____
Jay Punia
Executive Officer

United Auburn Indian Community

By _____ Date _____
Gene Whitehouse
Chairperson

Enterprise Rancheria Estom Yumeka Maidu Tribe

By _____ Date _____
Glenda Nelson
Chairperson

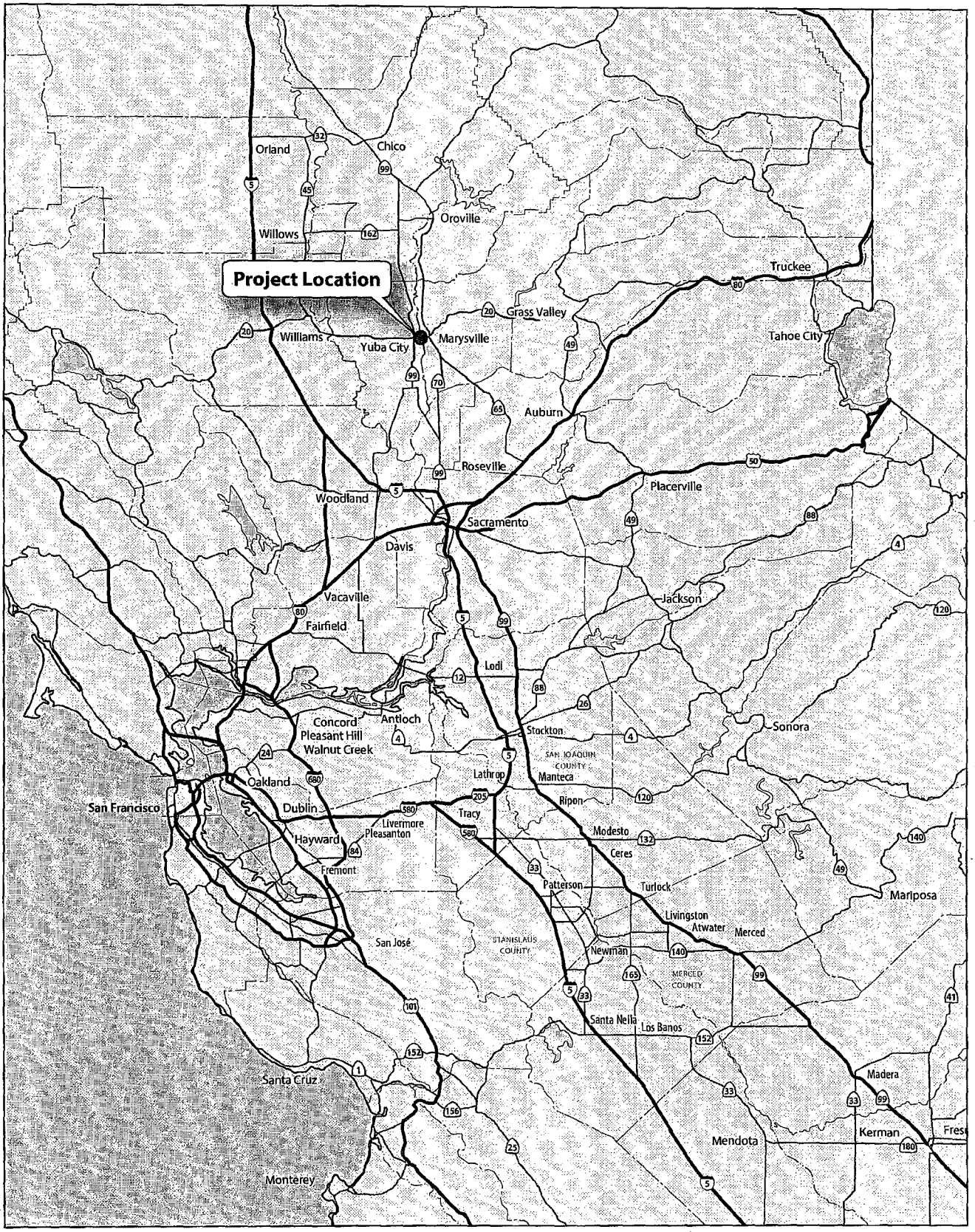

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Figure 1
Project Location

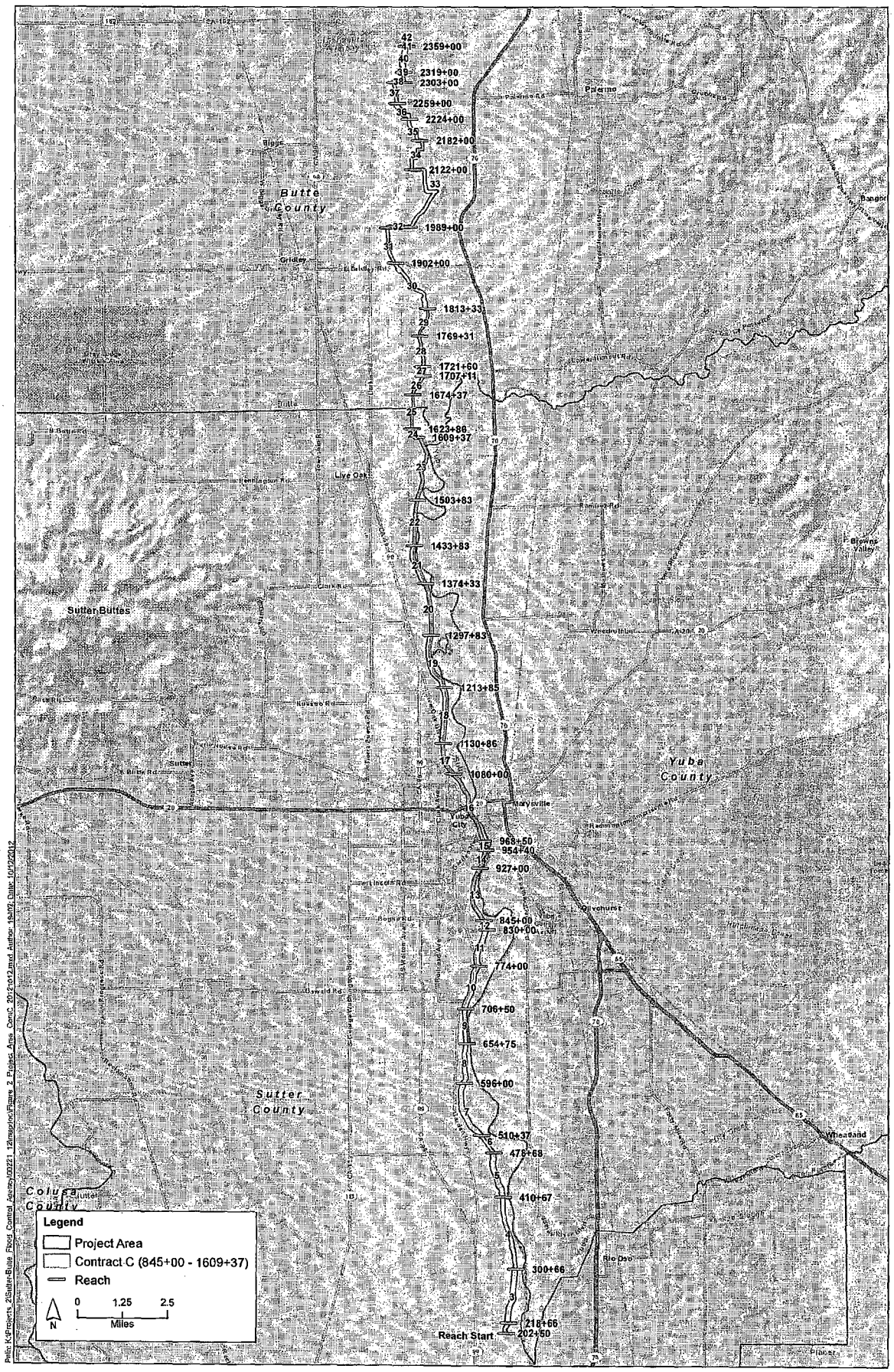


Figure 2
Project Area

Feather River West Levee Project: Description of the Project and U.S. Army Corps of Engineers Undertakings

Introduction

The Sutter Butte Flood Control Agency (SBFCA) is proposing the Feather River West Levee Project (FRWLP, or project) to reduce flood risk in the Sutter Basin, which includes portions of Sutter and Butte Counties in the Sacramento Valley of California. This project would result in the construction of improvements to the Feather River West Levee on levee reaches 2–41.

Within the planning area, SBFCA's goal is to achieve a minimum of 200-year flood protection for the more urbanized areas with population centers and 100-year protection for the remaining more rural agricultural parts. A 200-year flood is a flood that has a 0.5% chance of occurring in any given year, also referred to as a 0.5% annual exceedance probability (AEP). A 100-year flood has a 1% AEP. The primary purpose of the FRWLP is to reduce flood risk in the Sutter Basin by addressing known levee deficiencies along the Feather River West Levee from Thermalito Afterbay downstream to a point approximately 4 miles upstream of the Feather River's confluence with the Sutter Bypass.

SBFCA would manage the construction of these improvements through four discrete construction contract mechanisms, spanning construction seasons from 2013 to 2015. The project vicinity and levee reaches where construction is proposed are depicted in Figures 1 and 2. These contracts and the associated levee reaches proposed for repair are summarized in Table 1.

Table 1. Feather River West Levee Project Construction Contracts, Reaches, and Years for Construction

Construction Contract	Project Reaches	Years for Construction
A	2–5	2014–2015
B	6–12	2014–2015
C	13–25	2013–2014
D	26–41	2014–2015

To complete the project, SBFCA must receive authorization from the U.S. Army Corps of Engineers (Corps) to modify the levee under Section 14 of the Rivers and Harbors Act (33 U.S. Code Section 408) (Section 408). SBFCA must also receive authorization from the Corps to discharge fill to waters of the United States under Section 404 of the Clean Water Act (33 U.S. Code Section 1344). Because the project associated with these permits and authorizations may affect historic properties, the Corps must comply with Section 106 of the National Historic Preservation Act (16 U.S. Code Section 470f) (Section 106).

Description of U.S. Army Corps of Engineers Undertakings and Management Approach

The Corps anticipates reviewing and authorizing the entire project under Section 408 in early 2013. This authorization would precede the completion of 100% design drawings for all phases as well as the

construction of the four contracts. Completion of the final design drawings depends on the design of ancillary project features such as borrow sites and landside utilities; these features are unrelated to the portion of the project relevant to Section 408. Because the final design would proceed in phases, the delineation of the final area of potential effects on historic properties would also proceed in phases; consequently, the Corps is using the programmatic agreement (PA) as a means of defining Corps commitments for management of historic properties and phasing that management process. The PA would document Section 106 compliance sufficiently for authorization under Section 408 and would guide the Corps in managing historic properties in a phased process that tracks with SBFCA's contracting mechanisms, construction schedule, and design constraints. The PA will also provide a means of documenting how Section 106 compliance will be completed in support of permits under Section 404 of the Clean Water Act.

Project Description

The project would be completed in the Sutter Basin. Located in north-central California in Sutter and Butte Counties, the Sutter Basin is part of the Sacramento River Flood Control Project (SRFCP). This elongated, irregularly shaped basin covers about 326 square miles; it is approximately 43 miles long north to south and up to 14 miles wide east to west and is roughly bounded by the Feather River (to the east), Cherokee Canal, the Sutter Buttes, and Sutter Bypass (to the west). Floodwaters potentially threatening the basin originate in the Feather River watershed or the upper Sacramento River watershed above Colusa Weir. These waterways have drainage areas of 5,921 and 12,090 square miles, respectively. Communities in the basin include Yuba City, Biggs, Gridley, Live Oak, and Sutter.

The project is focused on the corridor along the Feather River West Levee from Thermalito Afterbay to a point approximately 4 miles north of the Sutter Bypass. This corridor is roughly 500 feet toward the land side of the existing levees and 100 feet toward the water side. This corridor was determined as the area in which levee improvements, such as seepage berms, stability berms, relief wells, setback levees, erosion protection, and slurry cutoff walls, are likely to be made. The corridor is approximately 41 miles long, divided into 41 relatively homogeneous reaches for ease of describing existing conditions, proposed actions, the affected environment, and potential environmental effects. (Note that this number is coincidental and one reach does not consistently correspond to a length of 1 mile; additionally, Reach 1 is not a part of the project.) The project area would also include borrow/spoil sites or project mitigation sites outside this corridor.

The affected area generally includes the 40+ miles of the Feather River West Levee from the Thermalito Afterbay to a point approximately 4 miles north of the Sutter Bypass. Along this linear area, open-water habitats include the river, ponds, and canals. Small ditches that provide open-water habitat for wildlife are also present in the affected area. Smaller agricultural canals associated with rice and other flooded crops are also present in the project area. Prehistoric cultural resources are documented in the project footprint and vicinity on both the landside and waterside of the Feather River West Levee. Historic-era archaeological and built environment resources are largely confined to the landside uplands but have the potential to occur on both the landside and waterside.

Attachment 2

Feather River West Levee Project: Outline and Guidance for the Historic Property Treatment Plan

1. Introduction and Description of the Project and Undertakings
   - 1.1. Description of the Project
     - 1.1.1. (brief description of the project that relies upon Corps undertakings)
   - 1.2. Section 106 Undertakings
     - 1.2.1. (brief description of the Section 106 undertakings such as Rivers and Harbors act and Clean Water Act authorization and permits)
   - 1.3. Purpose and Organization of this Historic Properties Treatment Plan

2. Regulatory Context
   - 2.1. Section 106 of the National Historic Preservation Act
     - 2.1.1. Phasing of Management Steps under Section 106 and the Programmatic Agreement
   - 2.2. State and Federal Law Governing Human Remains
     - 2.2.1. California Law
     - 2.2.2. Native American Graves Protection and Repatriation Act

3. Public and Native American Consultation
   - 3.1. Initial Consultation Efforts
     - 3.1.1. (summary of consultation efforts to date)
   - 3.2. Future Consultation
     - 3.2.1. (summary of future consultation as required under the PA)

4. Natural and Cultural Setting
   - 4.1. Natural Environment
   - 4.2. Prehistoric Context
   - 4.3. Ethnographic Context
   - 4.4. Historic Context

5. Technical Methods for Implementing the Programmatic Agreement
   - 5.1. Inventory
     - 5.1.1. Defining the Area of Potential Effects
       - 5.1.1.1. (describe how the APE will be defined for each phase)
     - 5.1.2. Inventory and Recording Methods
     - 5.1.3. Evaluation
       - 5.1.3.1. Evaluation for the National Register of Historic Places
         - 5.1.3.1.1. Archaeological Resources
         - 5.1.3.1.2. Built Environment Resources
         - 5.1.3.1.3. Traditional Cultural Properties
         - 5.1.3.1.4. Rural Historic Landscapes

5.2. Finding of Effect
5.2.1. Application of the Criteria of Adverse Effect Under Section 106

6. Treatment Methods for Resolving Adverse Effects
6.1. Archaeological Resources
6.1.1. (typical treatment methods such as data recovery or preservation in place)
6.2. Built Environment Resources
6.2.1. (typical treatments such as HABS/HAER)
6.3. Traditional Cultural Properties
6.3.1. (typical treatments such as documentation, avoidance, etc.)
6.4. Rural Historic Landscapes
6.4.1. (HALS)

7. Curation of Recovered Materials
7.1. Curation Methods and Standards

8. Construction Monitoring and Inadvertent Discoveries
8.1. Workforce Training
8.2. Monitoring
8.3. Procedures for Inadvertent Discoveries
8.3.1. Stopping Work
8.3.2. Notification to the Corps and Levee Maintaining Agency
8.3.3. Evaluation of the Discovery
8.3.4. Finding of Effect/Treatment (As Necessary)

9. References Cited

STATE OF CALIFORNIA – THE RESOURCES AGENCY EDMUND G. BROWN, JR., *Governor*

OFFICE OF HISTORIC PRESERVATION
DEPARTMENT OF PARKS AND RECREATION
P.O. BOX 942896
SACRAMENTO, CA 94296-0001
(916) 653-6624 Fax: (916) 653-9824
calshpo@ohp.parks.ca.gov
www.ohp.parks.ca.gov

July 23, 2013 In Reply Refer To: COE120702B

E. Scott Clark
Acting Chief, Planning Division
Department of the Army
U.S. Army Engineer District, Sacramento
1325 J Street
Sacramento, CA 95814-2922

Re: Section 106 Consultation for the proposed Reach 13 phase of the Feather River West Levee Project

Dear Mr. Clark:

The Army Corps of Engineers (COE) is seeking my comments on its determination of effects that the proposed undertaking will have on historic properties. You do so pursuant to 36 CFR Part 800 (as amended 8-05-04) regulations implementing Section 106 of the National Historic Preservation Act, and the Programmatic Agreement Among the U.S. Army Corps of Engineers, Sutter Butte Flood Control Agency, and the California State Historic Preservation Officer Regarding the Feather River West Levee Project Sutter and Butte Counties, California.

This project is a component of Feather River West Levee Project being proposed and implemented by the Sutter Butte Flood Control Agency.

Cultural resource inventory under the Programmatic Agreement included pedestrian survey of the APE, along with prospective subsurface inventory efforts in attempts to locate any historic or archaeological sites. The inventory identified two cultural resources in the APE: the Shanghai Bend Dump (P-51-100) and the Feather River West Levee.

The COE is requesting a determination of non-eligibility in accordance with 36 CFR 800.4(c)(2) for the Shanghai Bend Dump (P-51-100). The remains associated with this site appear to occur in a disturbed context and do not maintain integrity or association with the site itself precluding any attempt to evaluate the resource for the National Register of Historic Places (NRHP).

The Feather River West Levee itself has yet to be formally evaluated, the COE is operating under the assumption of eligibility and that the work conducted on this phase of the project would not adversely affect the resource.

In addition to your letter and attachments, you have submitted the following document as evidence of your efforts to identify historic properties in the project Area of Potential Effects (APE):

- *Inventory of Historic Properties and Finding of Effect for the Feather River West Levee Project, (ICF, June 2013).*

After reviewing your letter and supporting documentation, I concur that the Shanghai Bend Dump (P-51-100) is not eligible to be listed on the NRHP and I concur that for the Reach 13 phase of the Feather River West Levee Project there will be no historic properties affected pursuant to 36 CFR Part 800.4(d)(1).

Be advised that under certain circumstances, such as unanticipated discovery or a change in project description, the COE may have additional future responsibilities for this undertaking under 36 CFR Part 800. Thank you for seeking my comments and for considering historic properties in planning your project. If you require further information, please contact Brendon Greenaway of my staff at phone 916-445-7036 or email brendon.greenaway@parks.ca.gov.

Sincerely,

Carol Roland-Nawi, PhD
State Historic Preservation Officer

DEPARTMENT OF THE ARMY
U. S. ARMY CORPS OF ENGINEERS
441 G STREET, NW
WASHINGTON, DC 20314-1000

CECW-SPD

SEP 1 3 2013

MEMORANDUM FOR Commander, South Pacific Division (ATTN: Clark Frentzen, CESPD-PDS-P), 1455 Market Street, San Francisco, California 94103-1398

SUBJECT: Record of Decision (ROD) – Feather River West Levee Project (FRWLP), Sutter and Butte Counties, California

1. References:

a. Memorandum, CESPK-CO-OR, 16 July 2013, subject: Draft Record of Decision (ROD) for Section 408 Approval of a Flood Risk Reduction Project Alteration: Feather River West Levee Project (Sutter 408), Sutter & Butte Counties, California (Enclosure 3).

b. Memorandum, CESPD-PDC, 17 July 2013, subject: Request for Section 408 Approval of a Flood Risk Reduction Project Alteration: Feather River West Levee Project (Sutter 408), Sutter and Butte Counties, California (Enclosure 2).

2. The ROD for subject project was signed by the approving official on 13 September 2013 (Enclosure 1).

3. The comments received during the Environmental Impact Statement (EIS) public review period did not require any changes to the Feather River West Levee Project (Sutter 408).

4. The FRWLP is a flood risk management project, proposed by the Central Valley Flood Protection Board (CVFPB) and to be constructed by the Sutter Butte Flood Control Agency (SBFCA). A ROD covering Reach 13 of Contract C, consisting solely of cutoff walls for approximately 2 miles of the FRWLP, to be constructed in 2013 was signed 19 July 2013. This ROD is for the remaining reaches of the FRWLP, approximately 39 miles, which consists of an additional 12 reaches for Contract C and various reaches for Contracts A, B, and D.

5. In order to ensure that the proposed action does not impair the usefulness of the existing federal project and that it will not be injurious to the public interest, the following conditions shall be imposed:

a. 33 U.S.C. §408 approval is conditional on compliance with all of the mandatory terms and conditions, as well as conservation measures, in the Biological Opinion (BO) (incorporated herein by reference). Failure to comply with these terms and conditions, and conservation measures associated with the incidental take statement in the BO, where the take of a listed species occurs, would constitute an unauthorized take and noncompliance with USACE's approval to proceed. The U.S. Fish and Wildlife Service (USFWS) is the appropriate authority

to determine compliance with the terms and conditions, as well as conservation measures, of the USFWS BO and with the Endangered Species Act.

b. The SBFCA is required to submit revisions to the Operations and Maintenance (O&M) Manuals for review and approval by the USACE, Sacramento District, within 180 days of construction completion. As-built drawings and permanent maintenance easement boundaries must be submitted in conjunction with the draft O&M Manual. Upon receipt of the draft O&M Manual, this office will schedule a transfer inspection with CVFPB to verify that all construction has been completed in accordance with the permission. Any features found to be deficient during that inspection will require CVFPB's correction prior to USACE accepting the alterations as part of the federal project. Within 180 days of construction completion, CVFPB must furnish a certification report that the work has been completed in accordance with the conditions of this permission. Further, if features constructed in accordance with the conditions of this permission differ from the federal project ultimately authorized, credit eligibility could be affected.

c. To ensure that there is mitigation for residual flood risk, CVFPB and SBFCA are required to update the Floodplain Management Plan that includes proactive elements for flood information dissemination, public awareness, notification and training, flood warning and evacuation plans, emergency flood operations plan with annual exercise, dedicated evacuation resources, and post-flood recovery plans. In accordance with items of local cooperation, this plan must be submitted within one year of the issuance of the 33 U.S.C. §408 letter of permission for Reach 13 Contract C. The CVFPB and SBFCA are required to participate in and comply with applicable federal flood plain management and flood insurance programs.

6. My point of contact for this project is Mr. Bradd Schwichtenberg, Deputy Chief, South Pacific Division Regional Integration Team, at (202) 761-1367.

Encls

STEVEN L. STOCKTON, P.E.
Director of Civil Works

CF:
CECW
CECW-SPD

RECORD OF DECISION
33 U.S.C. SECTION 408 PERMISSION FOR
THE FEATHER RIVER WEST LEVEE PROJECT
SUTTER AND BUTTE COUNTIES, CA

The Feather River West Levee Project (FRWLP) is a flood risk management project, proposed by the Central Valley Flood Protection Board (CVFPB) and to be constructed by the Sutter Butte Flood Control Agency (SBFCA). I have considered the District and Division Commander recommendations on the Final Environmental Impact Statement (FEIS), dated June 2013. A Record of Decision (ROD) covering Reach 13 of Contract C, consisting solely of cutoff walls for approximately 2 miles of the FRWLP, to be constructed in 2013 was signed 19 July 2013. This ROD is for the remaining reaches of the FRWLP, approximately 39 miles, which consists of an additional 12 reaches approximately 39 miles for Contract C and various reaches for Contracts A, B, and D.

Because the FRWLP consists of proposed modifications to the west levee of the Feather River, a feature of the Sacramento River Flood Control Project (SRFCP) authorized by Congress under the Flood Control Act of March 1917, the CVFPB must seek permissions by the US Army Corps of Engineers (Corps) pursuant to 33 U.S.C §408. The Assistant Secretary of the Army (Civil Works) has delegated approval authority to the U.S. Army Corps of Engineers' Chief of Engineers, who further delegated approval authority to the Director of Civil Works, to issue permission to proceed with the proposed construction pursuant to 33 U.S.C. §408 based on a finding that the proposed alteration is not injurious to the public interest and would not impair the usefulness of the SRFCP.

A ROD was prepared for the Section 408 Reach 13 increment to allow the CVFPB to expedite critical life safety flood risk reduction while I considered the broader more complex Section 408 decision. Reach 13, the Shanghai Bend reach represents the highest deficiency and risk in the system, and earlier construction of this reach would significantly reduce risk within the system. Reach 13 has the same design for the proposed Section 408 FRWLP and for the National Economic Development and Locally Preferred plans described in the Sutter Basin Pilot Feasibility Study (SBPFS). Therefore, Reach 13 required less policy review.

Based on this review and the views of other interested agencies and the public, I find that the selected plan for the FRWLP as presented in the FEIS (Notice of Availability for final EIS was published in the *Federal Register* on June 14, 2013) is based on life safety requirements, is considered cost effective, is technically sound, is in accordance with environmental statutes, and is in the public interest. The benefits to be gained from implementing the selected plan outweigh any known adverse effects. Thus, pursuant to 33 U.S.C. §408, I approve the request by the CVFPB and the SBFCA to modify the SRFCP as described below.

I. Background

The purpose of the FRWLP is to improve the flood risk management capability of the levee system in the project area. The FRWLP specifically focuses on seepage, slope stability, and

erosion along the 41 miles of levee of the SRFCP. The overall FRWLP comprises work to be implemented under four contracts (A, B, C, and D).

To initiate the process to seek Corps permission for the entire FRWLP, a letter from the CVFPB requesting 33 U.S.C. §408 permission was received on November 2, 2012. The Corps' authority to grant permission for the FRWLP under 33 U.S.C. §408 triggers the Corps requirement to comply with the National Environmental Policy Act (NEPA). The EIS was developed to fully evaluate the impacts of the proposed work. The Feather River levees have been evaluated in previous environmental documents for the SRFCP, including the 1992 SRFCP Systems Evaluation EIS. Currently, the Corps is conducting a related study, the SBPFS. The FRWLP is being advanced by SBFCA to expeditiously reduce flood risk before the SBPFS is completed. The Corps released an integrated Sutter Basin Draft Pilot Feasibility Report and Draft EIR/Draft Supplemental EIS (DEIR/SEIS) for public review in June 2013. The DEIR/SEIS for the SBPFS tiers from, and was released concurrently with release of the FEIS for the FRWLP.

This ROD considers Reaches 2-41 of the FRWLP (stations 202+50 to 2368+00) pursuant to the Corps' authority under 33 U.S.C. §408. The specific flood risk management features are summarized below and detailed in Table 2-4 of the FEIS:

- **Contract A** consists of reaches 2 to 5 and is scheduled for construction in 2014 and 2015. The work consists of cutoff walls and seepage berms.
- **Contract B** consists of reaches 6 to 12 and is scheduled for construction in 2014 and 2015. The work consists of cutoff walls, relief wells, and utility relocations.
- **Contract C** consists of reaches 13 to 25 and is scheduled for construction in 2013 (reach 13) and 2014. The work consists of cutoff walls.
- **Contract D** consists of reaches 26 to 41 and is scheduled for construction in 2014 and 2015. The work consists of cutoff walls, levee reconstruction, and seepage berms.

II. Alternatives Considered

The No Action Alternative was compared to three different alternative measures and their environmental effects. Each alternative was developed to address seepage related deficiencies and is summarized below. More detailed descriptions and environmental effects of the alternatives can be found in the FEIS, dated June 2013.

- **Alternative 1** focuses on those measures that would predominantly keep within the existing footprint of the Feather River west levee. Advantages of using this alternative are that it may minimize real estate acquisition and changes in land use. However, this alternative has a higher cost than the preferred alternative (below). This alternative primarily proposes cutoff walls as a technique to address the deficiencies to current design standards while minimizing change in the existing levee footprint.

- **Alternative 2** includes measures that would not be constrained by the existing footprint of the Feather River west levee. Advantages of this alternative are that it may more effectively address the deficiencies to current design standards. However, this alternative has the greatest environmental effect and the highest cost of these three alternatives. This alternative primarily proposes stability berms and seepage berms, which would

substantially extend beyond the current levee footprint. Some cutoff walls and other work such as levee reconstruction and utility replacements would also be included with this alternative.

- **Alternative 3** (preferred and selected alternative) is an optimized blend of the above two alternatives. This alternative is also considered the environmentally preferable alternative because it balances borrow material import needs, emissions, real estate acquisition, land use change, construction-related disturbance, and habitat effects and it has the least long-term effect on Waters of the U.S. and agricultural lands. Several factors were considered for optimization, including the effectiveness of addressing the deficiencies to current design standards, compatibility with land use, minimization of real estate acquisition, and avoidance of effects and costs. This alternative proposes a combination of cutoff walls, levee reconstruction, and seepage berms.

III. Consideration of Mitigation Measures

Although all practicable means to avoid, minimize, and compensate for adverse effects on environmental resources have been incorporated into the FRWLP, the proposed action would have several unavoidable significant effects. Mitigation for these and for other adverse effects is incorporated into the project. The Mitigation and Monitoring Plan will guide the SBFCA in the mitigation requirements for project effects to fish and wildlife habitat, including endangered species.

A. Significant and Unavoidable Effects. Due to the large volume of haul traffic and the operation of a wide range of construction equipment, short-term emissions of reactive organic gases during construction of the entire FRWLP would result in significant and unavoidable air quality effects in the Feather River Air Quality Management District (FRAQMD) covering Sutter County. Implementation of mitigation measures would greatly reduce project-generated construction emissions, but would not reduce all emissions to below FRAQMD thresholds. To compensate for any emissions above air quality thresholds the SBFCA has agreed to provide payment into the applicable air quality mitigation fee program.

During some time periods, short-term noise and vibrations affecting residents along the FRWLP would be significant and unavoidable. This is especially true for construction in reaches immediately adjacent to Yuba City.

Consultation with the SHPO and Native American Tribes, in accordance with Section 106 of the NHPA, has led to the determination that a number of potentially significant cultural resources could be affected by project activities. The Corps, SBFCA, and the SHPO are all parties to a programmatic agreement (PA), signed 1 July 2013. Pursuant to the PA and prior to construction, surveys would be conducted and Historic Properties Treatment Plans would be prepared by the Corps and SBFCA, in consultation with the SHPO and Native American Tribes, to resolve adverse effects to historic properties. The treatment plans would include mitigation measures that are consistent with those proposed in the FEIS. Additional work to identify and evaluate significant cultural resources and resolve any potential adverse effects to such resources is being undertaken pursuant to the PA. Following the requirements of the PA, construction shall not begin on any reach, contract, or phase of the project until the consultation process is complete.

B. Mitigation for Significant Effects. The May 2, 2013 USFWS Biological Opinion (BO) for the FRWLP included 4 terms and conditions and 16 conservation measures. SBFCA will implement all terms and conditions and conservation measures. The FRWLP includes mitigation for effects to the threatened valley elderberry longhorn beetle (VELB) and the threatened giant garter snake (GGS) and their habitats. Compensatory mitigation for project effects on VELB includes transplanting elderberries, planting of other vegetation, and protection of habitats that would support the species. Construction would require compensation for the loss of 91 elderberry plants and would require protection measures for 175 other plants, of which 16 were protected during the 2013 work for Reach 13. If transplanting of elderberries is undertaken outside of the normal transplanting window, the higher planting requirements specified in the BO would apply. Proposed compensatory mitigation for project effects to GGS would include pre-construction surveys, fencing, time of year restrictions, protection of agricultural areas that serve as GGS habitat, and purchase of credits at a compensation bank. Construction would have potential impacts to upland habitat for GGS along the levee.

The Mitigation and Monitoring Plan will guide the SBFCA and the CVFPB as they manage the compensatory land in perpetuity. The plan establishes specific success criteria for the habitat components, specifies contingency measures to be undertaken if success criteria are not met, and describes short-term and long-term management and maintenance of the mitigation lands.

The National Marine Fisheries Service (NMFS) provided the Corps with a letter of concurrence with the Corps determination of "not likely to adversely affect", which contains terms and conditions and requires applicable Conservation Measures. SBFCA will implement these terms and conditions and other measures.

The USFWS Coordination Act Report (CAR) for the FRWLP was issued on May 18, 2013. The CAR contained 7 (of 10 total) recommendations applicable for the FRWLP, including Reach 13. SBFCA will implement these recommendations. The other three CAR recommendations applied solely to the SBPFS.

The FRWLP includes designs to compensate for the loss of riparian vegetation and other long-term effects to vegetation on the waterside of the Feather River west levee slope. Long-term effects would be compensated through revegetation with native species at a 2:1 ratio, in-kind, where feasible. A bentonite slurry spill contingency plan (BSSCP) would be developed and included in the Stormwater Water Pollution and Prevention Plan (SWPPP) or slurry work plan developed prior to construction by the construction contractor.

Prior to initiation of each construction season, a qualified biologist will be required to conduct surveys in and near the work areas to determine the presence of any active migratory bird nests. If no nests are found, then construction may proceed. If active nests are found, then SBFCA would coordinate with the USFWS to determine appropriate buffer areas or other measures to avoid disturbing the nests until the young have fledged. When possible, construction would be conducted during the non-breeding season for migratory birds.

The FRWLP is expected to have a potentially significant effect on groundwater and surface water quality from contact with the water table. However, these water quality effects will be minimized through the development and implementation of the: BSSCP; SWPPP; and a spill, prevention, control, and counter measure plan.

The FRWLP would also have a potentially significant effect on the alteration of existing drainage patterns in the area. However, these geomorphic and flood risk management effects would be mitigated by coordinating the work with the owners and operators of the local drainage systems and affected landowners, preparing any needed drainage studies, and remediating effects through final project design.

Housing would also be potentially significantly affected by the FRWLP since five residences would need to be acquired and demolished to complete the project. However, the landowners would be provided fair monetary compensation, and SBFCA will develop a resident relocation plan to mitigate for the effects.

C. Mitigation for Less than Significant Effects. The entire FRWLP would have less-than-significant effects on other resources including traffic, fisheries, agriculture and land use, recreation, soils, climate change and greenhouse gases, and visual resources. However, mitigation measures, such as minimizing greenhouse gas emissions during construction, would be used by the construction contractor to further minimize effects on that resource. The SBFCA has also agreed to follow all 12 recommended measures in the April 10, 2013, NMFS concurrence letter to further minimize and compensate for effects on riparian habitat that provides fish habitat during floodwaters.

IV. Conclusion

This ROD completes the NEPA process for the FRWLP. The ROD will be publicly available upon request or can be found on the Sacramento District's and SBFCA's web sites.

PERMISSION UNDER 33 U.S.C. §408

Based on my consideration of the District and Division Commander recommendations on the 33 U.S.C. §408 package, the FEIS, the views of the Federal, State, regional, and local agencies, and input from the public, I find the recommended FRWLP to be technically adequate and not an impairment to the usefulness of the existing Federal project; to be in accordance with environmental statutes; and not to be injurious to the public interest. Therefore, pursuant to my delegated authority under 33 U.S.C. §408, the request for alteration of the Sacramento River Flood Control Project, the Feather River West Levee Project, is approved. I hereby grant permission to the CVFPB to allow SBFCA to construct the FRWLP and to alter the Federal project.

13 SEP 13
Date

Steven L. Stockton
Director of Civil Works

STATE OF CALIFORNIA – CALIFORNIA NATURAL RESOURCES AGENCY EDMUND G. BROWN JR., Governor

DEPARTMENT OF WATER RESOURCES
DIVISION OF FLOOD MANAGEMENT
P.O. BOX 219000
SACRAMENTO, CA 95821-9000

May 16, 2013

Mr. Michael W. Bessette, P.E.
Director of Engineering
Sutter Butte Flood Control Agency
1227 Bridge Street, Suite C
Yuba City, CA 95991

State Maintenance Area 16 Endorsement for Feather River West Levee Project Area C

Dear Mr. Bessette:

The Department of Water Resources (DWR) Flood Maintenance Office (FMO) is responsible for maintaining Maintenance Area 16 (MA16) in Sutter County. The Sutter Butte Flood Control Agency (SBFCA) is anticipating beginning construction of a flood risk reduction project consisting primarily of a seepage cutoff wall in July 2013. MA16 boundaries within the Project Area C limits extend from approximately Station 1460+00 to Station 1625+00.

MA16 has concerns regarding the extent to which the Project Area C will address known deficiencies. These concerns have been expressed in several plan reviews and in recent meetings with SBFCA and Central Valley Flood Control Board (CVFPB) staff. MA16 expects SBFCA to address the following concerns as part of Project Area C:

- Post-project maintenance on oversteepened levee slopes (greater than 2:1 (H:V) landside and 3:1 waterside) will continue to be difficult. It is understood that the levee slopes will be rebuilt to the pre-project geometry. The U.S. Army Corps of Engineers (USACE) Periodic Inspections along with PL84-99 eligibility require levee slopes to match as-constructed conditions. MA16 needs to be assured that the re-built slopes will not be any steeper than the original as-built drawings show.

- There is concern that the levee material with steep slopes will be very susceptible to erosion, especially before vegetative cover is established. MA16 needs to be assured that post-construction maintenance is included in the project to establish an acceptable vegetative cover on the slopes.

- The Sutter Butte Main Canal travels parallel along the levee toe for a portion of the project. Because of the presence of the canal at the levee toe, the slope is more susceptible to slips and erosion. Maintenance of the levee slope and the canal needs to be clarified before the project is turned back over for operations and maintenance.

- There are many variances being requested to the California Code of Regulations Title 23, many regarding encroachments, such as pipes. MA16 wants to be assured that a clear record of all variances is accepted by CVFPB and USACE, and that the responsible maintainer is identified before the project is complete.

- There is a history of adjacent landowners in the area performing farming operations or disposing of debris within the state right of way which is considered an unacceptable encroachment. We have requested a fence along the right-of-way be established as part of this project since this is a good opportunity to do so. MA16 will have to consider assessing the local beneficiaries in order to install a fence if this project does not intend to provide one.

Provided these concerns are addressed by SBFCA, I hereby endorse the Feather River West Levee Project Area C.

If you have any questions or need additional information, please contact me at (530) 755-0071 or email at karen.hull@water.ca.gov.

Sincerely,

Karen Hull, Superintendent
Sutter Maintenance Yard

cc: Jennifer Fasani (DWR)
David Williams (CVFPB)
David Pesavento (DWR)

State of California

DEPARTMENT OF WATER RESOURCES
CENTRAL VALLEY FLOOD PROTECTION BOARD

California Natural Resources Agency

APPLICATION FOR A CENTRAL VALLEY FLOOD PROTECTION BOARD ENCROACHMENT PERMIT

Application No. 18793-1
(For Office Use Only)

1. Description of proposed work being specific to include all items that will be covered under the issued permit.
SBFCA - Feather River West Levee; Project Area-C

2. Project Location: _____ County, in Section _____
Township: _____ (N) (S), Range: _____ (E) (W), M. D. B. & M.
Latitude: _____ Longitude: _____
Stream: _____ Levee: _____ Designated Floodway: _____
APN: _____

3. _____ (Name of Applicant / Land Owner) of _____ (Address)
_____ (City) _____ (State) _____ (Zip Code) _____ (Telephone Number)
_____ (E-mail)

4. _____ (Name of Applicant's Representative) of _____ (Company)
_____ (City) _____ (State) _____ (Zip Code) _____ (Telephone Number)
_____ (E-mail)

5. Endorsement of the proposed project from the Local Maintaining Agency (LMA)

We, the Trustees of LEVEE DISTRICT #1 OF SUTTER (Name of LMA) approve this plan, subject to the following conditions:

☐ Conditions listed on back of this form ☐ Conditions Attached ☒ No Conditions

Trustee 4/16/13 Date — Trustee Date

Trustee 4/16/13 Date — Trustee Date

State of California | DEPARTMENT OF WATER RESOURCES | CENTRAL VALLEY FLOOD PROTECTION BOARD | California Natural Resources Agency

APPLICATION FOR A CENTRAL VALLEY FLOOD PROTECTION BOARD ENCROACHMENT PERMIT

Application No. ____________ (For Office Use Only)

1. Description of proposed work being specific to include all items that will be covered under the issued permit.

See attached.

2. Project Location: Sutter County County, in Section S10

Township: T15N (N) (S), Range: R3E (E) (W), M. D. B. & M.

Latitude: 39 10 7.62 Longitude: 121 37 21.49

Stream : Feather River , Levee : West Levee Designated Floodway: ____________

APN: See attached list

3. Land Owners vary, Applicant is SBFCA (Name of Applicant / Land Owner) of 1441 Garden Highway (Address)

Yuba City (City) CA (State) 95991 (Zip Code) 916-679-8861 (Telephone Number)

____________ (E-mail)

4. Jesse Patchett (Name of Applicant's Representative) of Wood Rodgers, Inc. (Company)

Sacramento (City) CA (State) 95816 (Zip Code) 916.341.7712 (Telephone Number)

jpatchett@woodrodgers.com (E-mail)

5. Endorsement of the proposed project from the Local Maintaining Agency (LMA):

We, the Trustees of Levee District 1 (Name of LMA) approve this plan, subject to the following conditions:

☐ Conditions listed on back of this form ☒ Conditions Attached ☐ No Conditions

Francis X Silva Chairman 4/16/2016

Trustee Date Trustee Date

Trustee Date Trustee Date

LEVEE DISTRICT NO. 1 – ENDORSEMENT CONDITIONS
UPRR GAP CLOSURE RELIEF WELL SYSTEM
YUBA CITY RAW WATER STABILITY BERM
VILLAGE GREEN PIPE CROSSING
LEVEE DISTRICT NO. 1 DOMESTIC WATER PIPE CROSSING
TWIN CITIES MEMORIAL BRIDGE GAP CLOSURE
CONVERSION OF SHANGHAI RELIEF WELLS TO OBSERVATION WELLS
REACH 7 RELIEF WELL SYSTEM INSTALLATION
ABANDONMENT OF REACH 7 USACE RELIEF WELLS

Levee District No. 1 of Sutter County (LD1) has the following conditions to be included on the Central Valley Flood Protection Board Encroachment Permit for the Sutter Butte Flood Control Agency. The work consist of UPRR Gap closure relief well system, Yuba City Raw Water Stability Berm, Village Green Pipe Crossing Improvements, Levee District No. 1 Domestic Water Pipe Crossing Improvements, Twin Cities Memorial Bridge (aka 5th Street Bridge) Gap Closure, Conversion of Shanghai Relief Wells to Observation Wells, Reach 7 Relief Well System Installation, and Abandonment of Reach 7 USACE relief wells. The conditions are as follows:

1. All improvements shall meet or exceed Central Valley Flood Protection Board Title 23, Department of Water Resources, DWR Urban Levee Design Criteria, FEMA, **LD1**, and U.S Army Corps of Engineers standards and requirements.

2. All work endorsed by this permit shall be in accordance with the submitted plans titled "Feather River West Levee Project, Volume 3, UPRR and Yuba City Raw Water GAP Closure Plans" dated April 5, 20 16, except as modified by special permit conditions herein. No further work, other than approved by this permit, shall be done in the area without prior endorsement of **LD1**. (*The plans submitted are 100% Design – Not for Construction. An endorsement signature block shall be placed on the "For Construction" improvement plans.* ***LD1*** *shall review and provide final endorsement at time "For Construction" plans are submitted.*)

3. All work endorsed by this permit shall be in accordance with the submitted plans titled "Feather River West Levee Project, Volume 4, Reach 7 Relief Well Plans" dated April 5, 20 16, except as modified by special permit conditions herein. No further work, other than approved by this permit, shall be done in the area without prior endorsement of **LD1**. (*The plans submitted are 100% Design – Not for Construction. An endorsement signature block shall be placed on the "For Construction" improvement plans.* ***LD1*** *shall review and provide final endorsement at time "For Construction" plans are submitted.*)

4. All work endorsed by this permit shall be in accordance with the submitted plans titled "Feather River West Levee Project, Volume 7, 5th Street Bridge Gap Closure Plans" April 5, 20 16, except as modified by special permit conditions herein. No further work, other than approved by this permit, shall be done in the area without prior endorsement of **LD1**. (*The plans submitted are For Bid – Not for Construction. An endorsement signature block shall be placed on the "For Construction" improvement plans.* ***LD1*** *shall review and provide final endorsement at time "For Construction" plans are submitted.*)

5. The Project shall not increase the 1-in-100 and/or the 1-in-200 design water surface elevation of the Feather River West Levee Project along the west bank of the Feather River as documented in the Technical Memorandum titled "Design Water Surface Profiles for the Feather River West Levee Project Addendum #2" dated December 27, 2013 for Sutter Butte Flood Control Agency (SBFCA)

prepared by Peterson and Brustand, Inc. (PBI). SBFCA shall review and approve any hydraulic analysis submitted by permittee.

6. The permittee shall be responsible for all liability associated with construction, operation, and maintenance of the permitted facilities and shall defend, indemnify, and hold **LD1**, the Central Valley Flood Protection Board, and the State of California; including its agencies, departments, boards, commissions, and their respective officers, agents, employees, successors and assigns (collectively, the "State"), safe and harmless, of and from all claims and damages arising from the Project undertaken pursuant to this permit, all to the extent allowed by law. The State expressly reserves the right to supplement or take over its defense, in its sole discretion.

7. The permittee shall defend, indemnify, and hold the Central Valley Flood Protection Board, **LD1**, and the State of California, including its agencies, departments, boards, commissions, and their respective officers, agents, employees, successors and assigns (collectively, the "State"), safe and harmless, of and from all claims and damages related to the Central Valley Flood Protection Board's approval of this permit, including but not limited to claims filed pursuant to the California Environmental Quality Act. The State expressly reserves the right to supplement or take over its defense, in its sole discretion.

8. The Central Valley Flood Protection Board, Department of Water Resources, and **LD1** shall not be held liable for any damages to the permitted encroachment(s) resulting from flood fight, operation, maintenance, inspection, or emergency repair.

9. No material stockpiles, temporary buildings, or equipment shall remain in the floodway during the flood season from November 1st to April 15th.

10. The relief wells shall be fully developed and base line flow testing shall be provided to **LD1**. The flow testing shall be in accordance with Central Valley Flood Protection Board, Department of Water Resources, USACE, and **LD1** standards. **LD1** flow testing standards shall be incorporated into the project specifications.

11. The telemetry and monitoring wells/piezometers located within the UPRR Gap Closure Relief Well field shall be a DWR facility. All OMRR&R shall be at the sole cost and expense of DWR.

12. The permittee shall convert the existing eighty-two (82) relief wells within Reach 13 (Shanghai Bend Area) to Observation wells. The Supplemental Operation and Maintenance manual shall outline that the Observation wells shall not require regular operation and maintenance or pump testing.

13. The permittee or USACE shall properly abandon the existing twenty five (25) relief wells within Reach 7 (Starr Bend Area).

14. The permittee shall provide OMRR&R funds to offset the cost of newly constructed infrastructure within **LD1** until such time **LD1** is able to increase assessment through a Proposition 218 Assessment update. Examples of the newly constructed infrastructure are the relief wells, concrete lined channel, monitoring wells/piezometers, pipeline for relief wells, and UPRR flood control. The permittee shall support **LD1** in a Proposition 218 Assessment update to fund the additional O&M costs and LAFCO annexation to include the entire benefit area within the District Boundary.

15. If the project or any portion thereof, is to be abandoned in the future, the permittee or successor shall abandon the project, at the permittee's or successor's sole cost and expense.

16. A set of As-Built Mylar plans and specifications shall be provided to **LD1** upon completion of the work.

17. A copy of the final Central Valley Flood Protection Board Permit shall be provided to **LD1** upon approval of the permit by the CVFPB Board.

18. **LD1** shall be notified five (5) working days prior to any construction activities.

Attachment B: Exhibit F - LD 9 Endorsements

State of California | DEPARTMENT OF WATER RESOURCES | California Natural Resources Agency
CENTRAL VALLEY FLOOD PROTECTION BOARD

APPLICATION FOR A CENTRAL VALLEY FLOOD PROTECTION BOARD
ENCROACHMENT PERMIT

Application No. 18793-1
(For Office Use Only)

1. Description of proposed work being specific to include all items that will be covered under the issued permit.
SBFCA - Feather River West Levee; Project Area - C

2. Project Location: ____ County, in Section ____
Township: ____ (N) (S), Range: ____ (E) (W), M. D. B. & M.
Latitude: ____ Longitude: ____
Stream: ____, Levee: ____ Designated Floodway: ____
APN: ____

3. ____ of ____
Name of Applicant / Land Owner | Address

City | State | Zip Code | Telephone Number

E-mail

4. ____ of ____
Name of Applicant's Representative | Company

City | State | Zip Code | Telephone Number

E-mail

5. Endorsement of the proposed project from the Local Maintaining Agency (LMA):

We, the Trustees of Levee District #9 approve this plan, subject to the following conditions:
Name of LMA

☐ Conditions listed on back of this form ☐ Conditions Attached ☒ No Conditions

David B. [signature] CHAIRMAN, LD9 4/16/13
Trustee Date | Trustee Date

Trustee Date | Trustee Date

State of California | DEPARTMENT OF WATER RESOURCES, CENTRAL VALLEY FLOOD PROTECTION BOARD | California Natural Resources Agency

APPLICATION FOR A CENTRAL VALLEY FLOOD PROTECTION BOARD ENCROACHMENT PERMIT

Application No. _____ (For Office Use Only)

1. Description of proposed work being specific to include all items that will be covered under the issued permit.

Work will include the installation approximately 22 relief wells, 8 monitoring wells, 1,800 LF of concrete lined ditch, approximately 5,300 LF of storm drain pipe, and access roads on the land side of the FRWL from STA 1095+15 to 1142+50.

2. Project Location: Sutter County County, in Section S10
Township: T15N (N) (S), Range: R3E (E) (W), M. D. B. & M.
Latitude: 39 10 7.62 Longitude: 121 37 21.49
Stream : Feather River , Levee : West Levee Designated Floodway: _____
APN: See attached list

3. Land Owners vary, Applicant is SBFCA (Name of Applicant / Land *Owner*) of 1441 Garden Highway (Address)
Yuba City (City) CA (State) 95991 (Zip Code) 916-679-8861 (Telephone Number)
_____ (E-mail)

4. Jesse Patchett (Name of Applicant's Representative) of Wood Rodgers, Inc. (Company)
Sacramento (City) CA (State) 95816 (Zip Code) 916.341.7712 (Telephone Number)
jpatchett@woodrodgers.com (E-mail)

5. Endorsement of the proposed project from the Local Maintaining Agency (LMA):

We, the Trustees of Levee District 9 (Name of LMA) approve this plan, subject to the following conditions:

☐ Conditions listed on back of this form ☑ Conditions Attached ☐ No Conditions

Daniel Shamu 5/19/15
~~Trustee~~ CHAIRMAN Date

_____ Trustee Date

_____ Trustee Date

_____ Trustee Date

Levee District No. 9 of Sutter County (LD9) has the following conditions to be included on the Central Valley Flood Protection Board Encroachment Permit for the Sutter Butte Flood Control Agency UPRR and Yuba City Raw Water Gap Closure Plans. The conditions are as follows:

1. All improvements shall meet or exceed Central Valley Flood Protection Board Title 23, Department of Water Resources, DWR Urban Levee Design Criteria, FEMA, **Levee District No. 9 of Sutter County**, and U.S Army Corps of Engineers Standards and requirements.

2. All work endorsed by this permit shall be in accordance with the submitted plans titled "Project Plans for Construction Feather River West Levee Project, Volume 3 of 3, UPRR and Yuba City Raw Water Gap Closure Plans" dated February 20, 2015. No further work, other than approved by this permit, shall be done in the area without prior endorsement of **Levee District No. 9 of Sutter County**.

3. The permittee shall be responsible for all liability associated with construction of the permitted facilities and shall defend, indemnify, and hold the **Levee District No. 9 of Sutter County**, Central Valley Flood Protection Board, and the State of California; including its agencies, departments, boards, commissions, and their respective officers, agents, employees, successors and assigns (collectively, the "State"), safe and harmless, of and from all claims and damages arising from the project undertaken pursuant to this permit, all to the extent allowed by law. The State expressly reserves the right to supplement or take over its defense, in its sole discretion.

4. The permittee shall defend, indemnify, and hold the Central Valley Flood Protection Board, **Levee District No. 9 of Sutter County**, and the State of California, including its agencies, departments, boards, commissions, and their respective officers, agents, employees, successors and assigns (collectively, the "State"), safe and harmless, of and from all claims and damages related to the Central Valley Flood Protection Board's approval of this permit, including but not limited to claims filed pursuant to the California Environmental Quality Act. The State expressly reserves the right to supplement or take over its defense, in its sole discretion.

5. The Central Valley Flood Protection Board, Department of Water Resources, and **Levee District No. 9 of Sutter County** shall not be held liable for any damages to the permitted encroachment(s) resulting from flood fight, operation, maintenance, inspection, or emergency repair.

6. A copy of operation and maintenance manual for the relief well system and concrete lined canal shall be provided to **Levee District No. 9 of Sutter County** upon completion of the work. The O&M manual shall include provisions for annual inspection which meet or exceed the CVFPB, DWR, USACE, and **Levee District No. 9 of Sutter County** standards. The results of the annual inspection shall be provided to **Levee District No. 9 of Sutter County** prior to November 1 each year.

7. The permittee may be required, at permittee's cost and expense, to remove, alter, relocate, or reconstruct all or any part of the permitted encroachment(s) if removal, alteration, relocation, or reconstruction is necessary as part of or in conjunction with any present or future flood control plan or project or if damaged by any cause. If the permittee does not comply, the Central Valley Flood Protection Board may remove the encroachment(s) at the permittee's expense.

8. The permitted encroachment(s) shall not interfere with operation and maintenance of the flood control project. If the permitted encroachment(s) are determined by any agency responsible for operation and maintenance of the flood control project to interfere, the permittee shall be required, at permittee's sole cost and expense, to modify or remove the permitted encroachment(s).

9. The relief wells shall be fully developed and base line flow testing shall be provided to **Levee District No. 9 of Sutter County**. The flow testing shall be in accordance with Central Valley Flood Protection Board, Department of Water Resources, USACE, and **Levee District No. 9 of Sutter County** standards. **Levee District No. 9 of Sutter County** standards shall be incorporated into the project specifications.

10. The permittee shall inquire with DWR to obtain any available funds to offset the cost of the O&M of the relief wells, O&M of the concrete lined ditch, and well replacement at the end of the 50-year design life. If the funding is not available from DWR, the permittee shall support **Levee District 9** of Sutter County in a Prop 218 assessment update to fund the additional O&M costs.

11. If the project or any portion thereof, is to be abandoned in the future, the permittee or successor shall abandon the project, at the permittee's or successor's sole cost and expense.

12. A set of As-Built Mylar plans and specifications shall be provided to **Levee District No. 9 of Sutter County** upon completion of the work.

13. A copy of the final Central Valley Flood Protection Board Permit shall be provided to **Levee District No. 9 of Sutter County** upon approval of the permit by the CVFPB Board.

14. **Levee District No. 9 of Sutter County** shall be notified five (5) working days prior to any construction activities.

From: David Lamon
To: Jesse Patchett
Subject: RE: SBFCA Gaps - LD9 Endorsement of Revised Relief Well Design at the UPRR Crossing
Date: Tuesday, April 19, 2016 2:58:17 PM

We are fine with our previous endorsement.

David Lamon, PE
City Services Director
City of Marysville
530-749-3902

From: Jesse Patchett [mailto:jpatchett@WoodRodgers.com]
Sent: Tuesday, April 19, 2016 9:52 AM
To: David Lamon
Cc: Sean Minard (sminard@mhm-inc.com); 'Michael Bessette'; Moricz, Nancy@DWR (Nancy.Moricz@water.ca.gov)
Subject: SBFCA Gaps - LD9 Endorsement of Revised Relief Well Design at the UPRR Crossing

Good morning Mr. Lamon,

We wanted to reach out to you regarding LD9's review of the updated plans for the relief wells at the UPRR Crossing. As you may recall, in May of last year, LD9 reviewed and endorsed SBFCA's proposed relief well and ditch design for the improvements that would be located within LD9 (see attached). We wanted to see if the District wants to formally review and endorse a new CVFPB Encroachment Permit application, or if the District is comfortable with the previous endorsement for the updated design.

The revised design maintains the previous approach for relief wells, monitoring wells, and concrete lined ditch, but the number of elements has been reduced. A comparison of the primary features from the May 2015 Design to the current design is shown in the table below.

May 2015 Design	Current Design
9 Relief Wells	5 Relief Wells
3 Monitoring Wells	2 Monitoring Wells
1 Telemetry Station	1 Telemetry Station
Approximately 700 LF of concrete lined ditch	Approximately 400LF of concrete lined ditch
Approximately 90LF of culvert under UPRR Tracks	Approximately 90LF of culvert under UPRR Tracks

Based on the similar design approach with fewer facilities within LD9's boundary, SBFCA is comfortable using the previous endorsement from LD9, but wanted to see if this was acceptable to LD9, or if you wanted us to submit a new CVFPB Encroachment Permit to the District for review and endorsement.

Please let us know your thoughts, and feel free to contact us should you have any questions, concerns, or need additional information.

Respectfully,

Jesse J. Patchett, PE, CFM
Wood Rodgers, Inc.
3301 C Street, Bldg. 100-B
Sacramento, CA 95816
916.341.7712 Direct
916.752-1300 Mobile
916.341.7767 Fax
jpatchett@woodrodgers.com
www.woodrodgers.com

LEVEE ENCROACHMENT LIST

SBFCA Reach	SBFCA STA	Encroachment	Title 23 Variances	Title 23 Variances - Justification
24/25	1623+86	Reach 24/25 Transition		
24	1610+92	Referred to as RD 777 Lateral 12. An 18 inch CM pipe through levee. Automatic drainage gate on waterside end of pipe. The CVFPB sent an encroachment violation notice on July 26, 2011 to Theodore Bill. The violation was regarding the heavy vegetation on the waterside outfall pipe.	112(b)(2). The flood season for work shall be November 1 through April 15. The variance shall be for work during the month of February 1 through April 15 on landside of sheet pile cutoff wall. 123(d)(7). Pipelines carrying gas or fluids under pressure must have a readily accessible rapid closure device located within ten (10) of the landside levee toe - All readily accessible rapid closure device to be located at waterside hinge of levee. 123(d)(9). The side slopes of trenches excavated for the installation of pipeline, conduit, or utility lines may not be steeper than one (1) horizontal to one (1) foot vertical. - Allow vertical slopes from bottom of trench to six (6) above pipe if using CLSM backfill. 123(d)(20). The material shall be compacted to ninety (90) percent per ASTM 1557 which imply soil. We propose to use CLSM backfill from invert of pipe to six (6) inches above pipe. 123(g)(7). Title 23 states that steel pipe shall be used for installations above the DWSE only. - We propose to allow the contractor to use reinforce concrete cylinder pipe (which is allowed in 123(g)(6)) along with concrete bar-wrapped cylinder pipe, cement mortar lined and coated steel pipe, coal-tar lined and coated steel pipe, and fusion bonded epoxy lined and coated steel pipe. 123(e)(1). The pipeline is not owned by public agency and levee height is greater than 15 feet. - This will require a variance unless a public agency accept ownership, operation, and maintenance of the pipeline.	112(b)(2). The Sutter Butte Main Canal is operational from April 1 through February 1, therefore the only available construction window occurs within the designated flood season. The scope of work shall be excavation of the levee to complete the replacement of the pipeline connection. The work will occur on the landside of the sheet pile cutoff wall. The backfill around pipe shall be CLSM. The variance shall be for work during the month of February 1 through April 15. 123(d)(7). The Design includes a positive closure device located on the waterside edge of levee crown. DWR ULDC requires a closure device to be located at the waterside hinge. The variance shall allow our project to meet DWR ULDC criteria without having two gate/butterfly valves on the pipeline resulting in increased head and O&M. 123(d)(9). We propose to use CLSM backfill to six (6) above pipe at which time we will meet the slope requirement. No sloping is proposed below this location. This variance is for the portion below the DWSE. This is the standard of practice in the field and on previous flood control projects. Sloping of the trench would result in a substantial increase in CLSM backfill with no real benefit. 123(d)(20). We propose to use CLSM backfill from invert of pipe to six (6) inches above pipe. - CLSM has been approved and in some cases required on pervious projects. The varience will clarify that CLSM is an acceptable backfill and no compaction shall be required. CLSM is the standard of practice and has been a requirement on some CVFPB permits. 123(g)(7). Cement mortar lined and coated steel pipe with the CLSM backfill will be the most cost effective and provide a design life greater than 50 years. The use of precast reinforced concrete pipe and reinforced cast-in-place concrete is not feasible and would subtaintiallly increase the cost of the pipe crossings. 123(e)(1). The current owner is not a public agency.
23/24	1609+37	Reach 23/24 Transition		
23	1536+12	~~RD 777 Lateral 7.~~ There is a 36 inch CM pipe through levee. Automatic drainage gate on waterside end of pipe. The CVFPB sent an encroachment violation notice on August 16, 2011 to Hatamiya Trust. On January 28, 1928, RD 777 abandoned Lateral #7 except that portion of therefore consisting of six hundred and fifty feet extending Westerly from the main canal of said Reclamation District and the plans or works of said District and so far as this District is concerned any person as persons or any Governmental Agency is hereby granted permission to fill the said lateral. County of Sutter also provided email indicating that the pipeline is not their facility. It appears that the landowner that recieved the NOV does not recieve any benefit of the pipeline or pipe crossing levee. The pipe appears to be on Manjinder Bains property	123(d)(9). The side slopes of trenches excavated for the installation of pipeline, conduit, or utility lines may not be steeper than one (1) horizontal to one (1) foot vertical. - We propose to use CLSM backfill to six (6) above pipe at which time we will meet the slope requirement. No sloping is proposed below this location. This variance is for the portion below the DWSE. This is the standard of practice in the field and on previous flood control projects. Sloping of the trench would result in a substantial increase in CLSM backfill with no real benefit. 123(d)(20). We propose to use CLSM backfill from invert of pipe to six (6) inches above pipe. - CLSM has been approved and in some cases required on pervious projects. The varience will clarify that CLSM is an acceptable backfill. CLSM is the standard of practice and has been a requirement on some CVFPB permits. 123(g)(7). Title 23 states that steel pipe shall be used for installations above the DWSE only. We propose to allow the contractor to use reinforce concrete cylinder pipe (which is allowed in 123(g)(6)) along with concrete bar-wrapped cylinder pipe, cement mortar lined and coated steel pipe, coal-tar lined and coated steel pipe, and fusion bonded epoxy lined and coated steel pipe. This would require a variance to use steel pipe below DWSE. We feel the cement mortar lined and coated steel pipe with the CLSM backfill will be the most cost effective and provide a design life greater than 50 years. The use of precast reinforced concrete pipe and reinforced cast-in-place concrete is not feasible and would subtaintiallly increase the cost of the pipe crossings. 123(e)(1). The pipeline is not owned by public agency and levee height is greater than 15 feet. - This will require a variance unless a public agency accept ownership, operation, and maintenance of the pipeline. Both RD 777 and Sutter County have indicated that do not operate and maintain the pipe crossing. RD 777 abandoned O&M of pipeline in 1928 according to their records.	123(d)(9). The side slopes of trenches excavated for the installation of pipeline, conduit, or utility lines may not be steeper than one (1) horizontal to one (1) foot vertical. - We propose to use CLSM backfill to six (6) above pipe at which time we will meet the slope requirement. No sloping is proposed below this location. This variance is for the portion below the DWSE. This is the standard of practice in the field and on previous flood control projects. Sloping of the trench would result in a substantial increase in CLSM backfill with no real benefit. 123(d)(20). We propose to use CLSM backfill from invert of pipe to six (6) inches above pipe. - CLSM has been approved and in some cases required on pervious projects. The varience will clarify that CLSM is an acceptable backfill. CLSM is the standard of practice and has been a requirement on some CVFPB permits. 123(g)(7). Title 23 states that steel pipe shall be used for installations above the DWSE only. We propose to allow the contractor to use reinforce concrete cylinder pipe (which is allowed in 123(g)(6)) along with concrete bar-wrapped cylinder pipe, cement mortar lined and coated steel pipe, coal-tar lined and coated steel pipe, and fusion bonded epoxy lined and coated steel pipe. This would require a variance to use steel pipe below DWSE. We feel the cement mortar lined and coated steel pipe with the CLSM backfill will be the most cost effective and provide a design life greater than 50 years. The use of precast reinforced concrete pipe and reinforced cast-in-place concrete is not feasible and would subtaintiallly increase the cost of the pipe crossings. 123(e)(1). The pipeline is not owned by public agency and levee height is greater than 15 feet. - This will require a variance unless a public agency accept ownership, operation, and maintenance of the pipeline. Both RD 777 and Sutter County have indicated that do not operate and maintain the pipe crossing. RD 777 abandoned O&M of pipeline in 1928 according to their records.

LEVEE ENCROACHMENT LIST

SBFCA Reach	SBFCA STA	Encroachment	Title 23 Variances	Title 23 Variances - Justification
22/23	1503+83	Reach 22/23 Transition		
22	1460+00	Levee District No. 9 Levees /Maintenance Area 16 Transition		
21/22	1433+83	Reach 21/22 Transition		
21	1430+55	Sunset Pump Station owned an operated by Sutter Extension Main Pump Station. There is a 60 Inch steel pipe through the levee. Pump end has gate valves on structure. Automatic drainage gates on the landside end.	112(b)(2). The flood season for work shall be November 1 through April 15. The variance shall be for work during the month of February 1 through April 15 on landside of sheet pile cutoff wall. 123(d)(7). Pipelines carrying gas or fluids under pressure must have a readily accessible rapid closure device located within ten (10) of the landside levee toe - All readily accessible rapid closure device to be located at waterside hinge of levee. 123(d)(9). The side slopes of trenches excavated for the installation of pipeline, conduit, or utility lines may not be steeper than one (1) horizontal to one (1) foot vertical. - Allow vertical slopes from bottom of trench to six (6) above pipe if using CLSM backfill. 123(d)(13). When practical, pipelines installed within a levee section must be separated from parallel pipelines by a minimum of 12 inches or the diameter of the largest pipe to a maximum of 36 inches. - Propose to allow decrease the maximum of 36 inches to 24 inches if CLSM backfill is used. 123(d)(20). The material shall be compacted to ninety (90) percent per ASTM 1557 which would imply soil. We propose to use CLSM backfill from invert of pipe to six (6) inches above pipe. 123(g)(7). Title 23 states that steel pipe shall be used for installations above the DWSE only. - We propose to allow the contractor to use reinforce concrete cylinder pipe (which is allowed in 123(g)(6)) along with concrete bar-wrapped cylinder pipe, cement mortar lined and coated steel pipe, coal-tar lined and coated steel pipe, and fusion bonded epoxy lined and coated steel pipe. The pipeline is a very low pressure installation at about 6 psi. The common practice is for new pressure pipes to be installed/designed above the design water surface elevation when feasible. USACE EM 1110-2-1913 states above DWSE "in general" but is not a requirement and provides criteria for installation below DWSE. No variance will be required but extra care will be taken. The DWR Urban Levee Design Criteria does make it a requirement for new installation. No variance is requested since no Title 23 requirement.	112(b)(2). The Sutter Butte Main Canal is operational from April 1 through February 1, therefore the only available construction window occurs within the designated flood season. The scope of work shall be excavation of the levee to complete the replacement of the pipeline connection. The work will occur on the landside of the sheet pile cutoff wall. The backfill around pipe shall be CLSM. The variance shall be for work during the month of February 1 through April 15. 123(d)(7). The Design includes a positive closure device located on the waterside edge of levee crown. DWR ULDC requires a closure device to be located at the waterside hinge. The variance shall allow our project to meet DWR ULDC criteria without having two gate/butterfly valves on the pipeline resulting in increased head and O&M. 123(d)(9). We propose to use CLSM backfill to six (6) above pipe at which time we will meet the slope requirement. No sloping is proposed below this location. This variance is for the portion below the DWSE. This is the standard of practice in the field and on previous flood control projects. Sloping of the trench would result in a substantial increase in CLSM backfill with no real benefit. 123(d)(13). Pipe diameters are 60 inch and 36 inch would result in a pipe spacing requirement of 36 inches. The existing pipes are less than 36 inches. They currently range from 26 inches to 40 inches. We feel it is not practical since the outfall structure is fixed and the pipes coming into the existing gate riser structure are fixed. This requirement would require a new outfall structure and modifications to the existing gate riser structure. The would substantially increase the cost with little to no benefit. 123(d)(20). We propose to use CLSM backfill from invert of pipe to six (6) inches above pipe. - CLSM has been approved and in some cases required on pervious projects. The variance will clarify that CLSM is an acceptable backfill and no compaction shall be required. CLSM is the standard of practice and has been a requirement on some CVFPB permits. 123(g)(7). Cement mortar lined and coated steel pipe with the CLSM backfill will be the most cost effective and provide a design life greater than 50 years. The use of precast reinforced concrete pipe and reinforced cast-in-place concrete is not feasible and would substantially increase the cost of the pipe crossings.

LEVEE ENCROACHMENT LIST

SBFCA Reach	SBFCA STA	Encroachment	Title 23 Variances	Title 23 Variances - Justification
21	1430+47	Sunset Pump Station owned an operated by Sutter Extension Main Pump Station. There is a 60 Inch steel pipe through the levee. Pump end has gate valves on structure. Automatic drainage gates on the landside end.	112(b)(2). The flood season for work shall be November 1 through April 15. The variance shall be for work during the month of February 1 through April 15 on landside of sheet pile cutoff wall. 123(d)(7). Pipelines carrying gas or fluids under pressure must have a readily accessible rapid closure device located within ten (10) of the landside levee toe - All readily accessible rapid closure device to be located at waterside hinge of levee. 123(d)(9). The side slopes of trenches excavated for the installation of pipeline, conduit, or utility lines may not be steeper than one (1) horizontal to one (1) foot vertical. - Allow vertical slopes from bottom of trench to six (6) above pipe if using CLSM backfill. 123(d)(13). When practical, pipelines installed within a levee section must be separated from parallel pipelines by a minimum of 12 inches or the diameter of the largest pipe to a maximum of 36 inches. - Propose to allow decrease the maximum of 36 inches to 24 inches if CLSM backfill is used. 123(d)(20). The material shall be compacted to ninety (90) percent per ASTM 1557 which would imply soil. We propose to use CLSM backfill from invert of pipe to six (6) inches above pipe. 123(g)(7). Title 23 states that steel pipe shall be used for installations above the DWSE only. - We propose to allow the contractor to use reinforce concrete cylinder pipe (which is allowed in 123(g)(6)) along with concrete bar-wrapped cylinder pipe, cement mortar lined and coated steel pipe, coal-tar lined and coated steel pipe, and fusion bonded epoxy lined and coated steel pipe. The pipeline is a very low pressure installation at about 6 psi. The common practice is for new pressure pipes to be installed/designed above the design water surface elevation when feasible. USACE EM 1110-2-1913 states above DWSE "in general" but is not a requirement and provides criteria for installation below DWSE. No variance will be required but extra care will be taken. The DWR Urban Levee Design Criteria does make it a requirement for new installation. No variance is requested since no Title 23 requirement.	112(b)(2). The Sutter Butte Main Canal is operational from April 1 through February 1, therefore the only available construction window occurs within the designated flood season. The scope of work shall be excavation of the levee to complete the replacement of the pipeline connection. The work will occur on the landside of the sheet pile cutoff wall. The backfill around pipe shall be CLSM. The variance shall be for work during the month of February 1 through April 15. 123(d)(7). The Design includes a positive closure device located on the waterside edge of levee crown. DWR ULDC requires a closure device to be located at the waterside hinge. The variance shall allow our project to meet DWR ULDC criteria without having two gate/butterfly valves on the pipeline resulting in increased head and O&M. 123(d)(9). We propose to use CLSM backfill to six (6) above pipe at which time we will meet the slope requirement. No sloping is proposed below this location. This variance is for the portion below the DWSE. This is the standard of practice in the field and on previous flood control projects. Sloping of the trench would result in a substantial increase in CLSM backfill with no real benefit. 123(d)(13). Pipe diameters are 60 inch and 36 inch would result in a pipe spacing requirement of 36 inches. The existing pipes are less than 36 inches. They currently range from 26 inches to 40 inches. We feel it is not practical since the outfall structure is fixed and the pipes coming into the existing gate riser structure are fixed. This requirement would require a new outfall structure and modifications to the existing gate riser structure. The would substantially increase the cost with little to no benefit. 123(d)(20). We propose to use CLSM backfill from invert of pipe to six (6) inches above pipe. - CLSM has been approved and in some cases required on pervious projects. The variance will clarify that CLSM is an acceptable backfill and no compaction shall be required. CLSM is the standard of practice and has been a requirement on some CVFPB permits. 123(g)(7). Cement mortar lined and coated steel pipe with the CLSM backfill will be the most cost effective and provide a design life greater than 50 years. The use of precast reinforced concrete pipe and reinforced cast-in-place concrete is not feasible and would substantially increase the cost of the pipe crossings.
21	1430+40	Sunset Pump Station owned an operated by Sutter Extension Main Pump Station. There is a 36 Inch steel pipe through the levee. Pump end has gate valves on structure. Automatic drainage gates on the landside end.	112(b)(2). The flood season for work shall be November 1 through April 15. The variance shall be for work during the month of February 1 through April 15 on landside of sheet pile cutoff wall. 123(d)(7). Pipelines carrying gas or fluids under pressure must have a readily accessible rapid closure device located within ten (10) of the landside levee toe - All readily accessible rapid closure device to be located at waterside hinge of levee. 123(d)(9). The side slopes of trenches excavated for the installation of pipeline, conduit, or utility lines may not be steeper than one (1) horizontal to one (1) foot vertical. - Allow vertical slopes from bottom of trench to six (6) above pipe if using CLSM backfill. 123(d)(20). The material shall be compacted to ninety (90) percent per ASTM 1557 which would imply soil. We propose to use CLSM backfill from invert of pipe to six (6) inches above pipe. 123(g)(7). Title 23 states that steel pipe shall be used for installations above the DWSE only. - We propose to allow the contractor to use reinforce concrete cylinder pipe (which is allowed in 123(g)(6)) along with concrete bar-wrapped cylinder pipe, cement mortar lined and coated steel pipe, coal-tar lined and coated steel pipe, and fusion bonded epoxy lined and coated steel pipe. The pipeline is a very low pressure installation at about 6 psi. The common practice is for new pressure pipes to be installed/designed above the design water surface elevation when feasible. USACE EM 1110-2-1913 states above DWSE "in general" but is not a requirement and provides criteria for installation below DWSE. No variance will be required but extra care will be taken. The DWR Urban Levee Design Criteria does make it a requirement for new installation. No variance is requested since no Title 23 requirement.	112(b)(2). The Sutter Butte Main Canal is operational from April 1 through February 1, therefore the only available construction window occurs within the designated flood season. The scope of work shall be excavation of the levee to complete the replacement of the pipeline connection. The work will occur on the landside of the sheet pile cutoff wall. The backfill around pipe shall be CLSM. The variance shall be for work during the month of February 1 through April 15. 123(d)(7). The Design includes a positive closure device located on the waterside edge of levee crown. DWR ULDC requires a closure device to be located at the waterside hinge. The variance shall allow our project to meet DWR ULDC criteria without having two gate/butterfly valves on the pipeline resulting in increased head and O&M. 123(d)(9). We propose to use CLSM backfill to six (6) above pipe at which time we will meet the slope requirement. No sloping is proposed below this location. This variance is for the portion below the DWSE. This is the standard of practice in the field and on previous flood control projects. Sloping of the trench would result in a substantial increase in CLSM backfill with no real benefit. 123(d)(20). We propose to use CLSM backfill from invert of pipe to six (6) inches above pipe. - CLSM has been approved and in some cases required on pervious projects. The variance will clarify that CLSM is an acceptable backfill and no compaction shall be required. CLSM is the standard of practice and has been a requirement on some CVFPB permits. 123(g)(7). Cement mortar lined and coated steel pipe with the CLSM backfill will be the most cost effective and provide a design life greater than 50 years. The use of precast reinforced concrete pipe and reinforced cast-in-place concrete is not feasible and would substantially increase the cost of the pipe crossings.
20/21	1374+33	Reach 20/21 Transition		

LEVEE ENCROACHMENT LIST

SBFCA Reach	SBFCA STA	Encroachment	Title 23 Variances	Title 23 Variances - Justification
20	1314+80	Micheli Storm Drainage Pump Station. To install a pump with 20 Inch steel discharge pipe through the right bank of the Feather River for the removal of stormwater.	123(d)(7). Pipelines carrying gas or fluids under pressure must have a readily accessible rapid closure device located within ten (10) of the landside levee toe - All readily accessible rapid closure device to be located at waterside hinge of levee. 123(d)(9). The side slopes of trenches excavated for the installation of pipeline, conduit, or utility lines may not be steeper than one (1) horizontal to one (1) foot vertical. - Allow vertical slopes from bottom of trench to six (6) above pipe if using CLSM backfill. 123(d)(20). The material shall be compacted to ninety (90) percent per ASTM 1557 which would imply soil. We propose to use CLSM backfill from invert of pipe to six (6) inches above pipe.	123(d)(7). The Design includes a positive closure device located on the waterside edge of levee crown. DWR ULDC requires a closure device to be located at the waterside hinge. The variance shall allow our project to meet DWR ULDC criteria without having two gate/butterfly valves on the pipeline resulting in increased head and O&M. 123(d)(9). We propose to use CLSM backfill to six (6) above pipe at which time we will meet the slope requirement. No sloping is proposed below this location. This variance is for the portion below the DWSE. This is the standard of practice in the field and on previous flood control projects. Sloping of the trench would result in a substantial increase in CLSM backfill with no real benefit. 123(d)(20). We propose to use CLSM backfill from invert of pipe to six (6) inches above pipe. - CLSM has been approved and in some cases required on pervious projects. The variance will clarify that CLSM is an acceptable backfill and no compaction shall be required. CLSM is the standard of practice and has been a requirement on some CVFPB permits.
19/20	1297+83	Reach 19/20 Transition		
19	1265+59	Sullivan Pump Station. 14 inch steel pipe through the levee. Pump and Gate valve in pump house on the channel bank. Concrete well on the bank. Siphon breaker in CMP riser on landside slope. (Sullivan Pump Station)	123(d)(7). Pipelines carrying gas or fluids under pressure must have a readily accessible rapid closure device located within ten (10) of the landside levee toe - All readily accessible rapid closure device to be located at waterside hinge of levee. 123(d)(9). The side slopes of trenches excavated for the installation of pipeline, conduit, or utility lines may not be steeper than one (1) horizontal to one (1) foot vertical. - Allow vertical slopes from bottom of trench to six (6) above pipe if using CLSM backfill. 123(d)(20). The material shall be compacted to ninety (90) percent per ASTM 1557 which would imply soil. We propose to use CLSM backfill from invert of pipe to six (6) inches above pipe.	123(d)(7). The Design includes a positive closure device located on the waterside edge of levee crown. DWR ULDC requires a closure device to be located at the waterside hinge. The variance shall allow our project to meet DWR ULDC criteria without having two gate/butterfly valves on the pipeline resulting in increased head and O&M. 123(d)(9). We propose to use CLSM backfill to six (6) above pipe at which time we will meet the slope requirement. No sloping is proposed below this location. This variance is for the portion below the DWSE. This is the standard of practice in the field and on previous flood control projects. Sloping of the trench would result in a substantial increase in CLSM backfill with no real benefit. 123(d)(20). We propose to use CLSM backfill from invert of pipe to six (6) inches above pipe. - CLSM has been approved and in some cases required on pervious projects. The variance will clarify that CLSM is an acceptable backfill and no compaction shall be required. CLSM is the standard of practice and has been a requirement on some CVFPB permits.
19	1229+41	Kewal Singh IR PS. A 16 inch steel pipe through levee. Pump in pump house on channel bank. Gate valve on the waterside end. Concrete standpipe.	123(d)(7). Pipelines carrying gas or fluids under pressure must have a readily accessible rapid closure device located within ten (10) of the landside levee toe - All readily accessible rapid closure device to be located at waterside hinge of levee. 123(d)(9). The side slopes of trenches excavated for the installation of pipeline, conduit, or utility lines may not be steeper than one (1) horizontal to one (1) foot vertical. - Allow vertical slopes from bottom of trench to six (6) above pipe if using CLSM backfill. 123(d)(20). The material shall be compacted to ninety (90) percent per ASTM 1557 which would imply soil. We propose to use CLSM backfill from invert of pipe to six (6) inches above pipe.	123(d)(7). The Design includes a positive closure device located on the waterside edge of levee crown. DWR ULDC requires a closure device to be located at the waterside hinge. The variance shall allow our project to meet DWR ULDC criteria without having two gate/butterfly valves on the pipeline resulting in increased head and O&M. 123(d)(9). We propose to use CLSM backfill to six (6) above pipe at which time we will meet the slope requirement. No sloping is proposed below this location. This variance is for the portion below the DWSE. This is the standard of practice in the field and on previous flood control projects. Sloping of the trench would result in a substantial increase in CLSM backfill with no real benefit. 123(d)(20). We propose to use CLSM backfill from invert of pipe to six (6) inches above pipe. - CLSM has been approved and in some cases required on pervious projects. The variance will clarify that CLSM is an acceptable backfill and no compaction shall be required. CLSM is the standard of practice and has been a requirement on some CVFPB permits.
18/19	1213+85	Reach 18/19 Transition		
18	1132+61	Levee District No. 1 Levees /Levee District No. 9 Transition		
17/18	1130+86	Reach 17/18 Transition		

LEVEE ENCROACHMENT LIST

SBFCA Reach	SBFCA STA	Encroachment	Title 23 Variances	Title 23 Variances - Justification
17	1127+48	Village Green Trailer Park - To install a 10 inch outfall pipe through the right bank levee of the Feather River to provide storm drainage for a mobile home park.	123(d)(7). Pipelines carrying gas or fluids under pressure must have a readily accessible rapid closure device located within ten (10) of the landside levee toe - All readily accessible rapid closure device to be located at waterside hinge of levee. 123(d)(9). The side slopes of trenches excavated for the installation of pipeline, conduit, or utility lines may not be steeper than one (1) horizontal to one (1) foot vertical. - Allow vertical slopes from bottom of trench to six (6) above pipe if using CLSM backfill. 123(d)(20). The material shall be compacted to ninety (90) percent per ASTM 1557 which would imply soil. We propose to use CLSM backfill from invert of pipe to six (6) inches above pipe.	123(d)(7). The Design includes a positive closure device located on the waterside edge of levee crown. DWR ULDC requires a closure device to be located at the waterside hinge. The variance shall allow our project to meet DWR ULDC criteria without having two gate/butterfly valves on the pipeline resulting in increased head and O&M. 123(d)(9). We propose to use CLSM backfill to six (6) above pipe at which time we will meet the slope requirement. No sloping is proposed below this location. This variance is for the portion below the DWSE. This is the standard of practice in the field and on previous flood control projects. Sloping of the trench would result in a substantial increase in CLSM backfill with no real benefit. 123(d)(20). We propose to use CLSM backfill from invert of pipe to six (6) inches above pipe. - CLSM has been approved and in some cases required on pervious projects. The variance will clarify that CLSM is an acceptable backfill and no compaction shall be required. CLSM is the standard of practice and has been a requirement on some CVFPB permits.
17	1111+46	West Onstott Frontage Road Pump Station and Clark Avenue Pump Station Drainage Area. 16 Inch welded steel 7 GA asphalt coated storm drain discharge pipe over levee connected to 24 inch pipe in overflow area, outfall ditch, and pipes in floodway (Source: City of Yuba City Pump Station No. 4 and City of Yuba City Pump Station No. 2)	123(d)(7). Pipelines carrying gas or fluids under pressure must have a readily accessible rapid closure device located within ten (10) of the landside levee toe - All readily accessible rapid closure device to be located at waterside hinge of levee. 123(d)(9). The side slopes of trenches excavated for the installation of pipeline, conduit, or utility lines may not be steeper than one (1) horizontal to one (1) foot vertical. - Allow vertical slopes from bottom of trench to six (6) above pipe if using CLSM backfill. 123(d)(20). The material shall be compacted to ninety (90) percent per ASTM 1557 which would imply soil. We propose to use CLSM backfill from invert of pipe to six (6) inches above pipe.	123(d)(7). The Design includes a positive closure device located on the waterside edge of levee crown. DWR ULDC requires a closure device to be located at the waterside hinge. The variance shall allow our project to meet DWR ULDC criteria without having two gate/butterfly valves on the pipeline resulting in increased head and O&M. 123(d)(9). We propose to use CLSM backfill to six (6) above pipe at which time we will meet the slope requirement. No sloping is proposed below this location. This variance is for the portion below the DWSE. This is the standard of practice in the field and on previous flood control projects. Sloping of the trench would result in a substantial increase in CLSM backfill with no real benefit. 123(d)(20). We propose to use CLSM backfill from invert of pipe to six (6) inches above pipe. - CLSM has been approved and in some cases required on pervious projects. The variance will clarify that CLSM is an acceptable backfill and no compaction shall be required. CLSM is the standard of practice and has been a requirement on some CVFPB permits.
17	1096+81	Yuba City Water Treatment Plant 28" (29 25/32" OD) 7 GA welded steel waterline pipe crossing of levee. New permit included installation of automatic drainage gates on pipelines. (copy of record drawings)	123(d)(7). Pipelines carrying gas or fluids under pressure must have a readily accessible rapid closure device located within ten (10) of the landside levee toe - All readily accessible rapid closure device to be located at waterside hinge of levee. 123(d)(9). The side slopes of trenches excavated for the installation of pipeline, conduit, or utility lines may not be steeper than one (1) horizontal to one (1) foot vertical. - Allow vertical slopes from bottom of trench to six (6) above pipe if using CLSM backfill. 123(d)(20). The material shall be compacted to ninety (90) percent per ASTM 1557 which would imply soil. We propose to use CLSM backfill from invert of pipe to six (6) inches above pipe.	123(d)(7). The Design includes a positive closure device located on the waterside edge of levee crown. DWR ULDC requires a closure device to be located at the waterside hinge. The variance shall allow our project to meet DWR ULDC criteria without having two gate/butterfly valves on the pipeline resulting in increased head and O&M. 123(d)(9). We propose to use CLSM backfill to six (6) above pipe at which time we will meet the slope requirement. No sloping is proposed below this location. This variance is for the portion below the DWSE. This is the standard of practice in the field and on previous flood control projects. Sloping of the trench would result in a substantial increase in CLSM backfill with no real benefit. 123(d)(20). We propose to use CLSM backfill from invert of pipe to six (6) inches above pipe. - CLSM has been approved and in some cases required on pervious projects. The variance will clarify that CLSM is an acceptable backfill and no compaction shall be required. CLSM is the standard of practice and has been a requirement on some CVFPB permits.
17	1096+71	Yuba City Water Treatment Plant 24" 7 GA welded steel waterline pipe crossing of levee. New permit included installation of automatic drainage gates on pipelines. (copy of record drawings)	123(d)(7). Pipelines carrying gas or fluids under pressure must have a readily accessible rapid closure device located within ten (10) of the landside levee toe - All readily accessible rapid closure device to be located at waterside hinge of levee. 123(d)(9). The side slopes of trenches excavated for the installation of pipeline, conduit, or utility lines may not be steeper than one (1) horizontal to one (1) foot vertical. - Allow vertical slopes from bottom of trench to six (6) above pipe if using CLSM backfill. 123(d)(20). The material shall be compacted to ninety (90) percent per ASTM 1557 which would imply soil. We propose to use CLSM backfill from invert of pipe to six (6) inches above pipe.	123(d)(7). The Design includes a positive closure device located on the waterside edge of levee crown. DWR ULDC requires a closure device to be located at the waterside hinge. The variance shall allow our project to meet DWR ULDC criteria without having two gate/butterfly valves on the pipeline resulting in increased head and O&M. 123(d)(9). We propose to use CLSM backfill to six (6) above pipe at which time we will meet the slope requirement. No sloping is proposed below this location. This variance is for the portion below the DWSE. This is the standard of practice in the field and on previous flood control projects. Sloping of the trench would result in a substantial increase in CLSM backfill with no real benefit. 123(d)(20). We propose to use CLSM backfill from invert of pipe to six (6) inches above pipe. - CLSM has been approved and in some cases required on pervious projects. The variance will clarify that CLSM is an acceptable backfill and no compaction shall be required. CLSM is the standard of practice and has been a requirement on some CVFPB permits.

LEVEE ENCROACHMENT LIST

SBFCA Reach	SBFCA STA	Encroachment	Title 23 Variances	Title 23 Variances - Justification
17	1096+62	Yuba City Water Treatment Plant 42"cement mortar lined and coated welded steel pipe waterline crossing of levee (copy of record drawings)	123(d)(7). Pipelines carrying gas or fluids under pressure must have a readily accessible rapid closure device located within ten (10) of the landside levee toe - All readily accessible rapid closure device to be located at waterside hinge of levee. 123(d)(9). The side slopes of trenches excavated for the installation of pipeline, conduit, or utility lines may not be steeper than one (1) horizontal to one (1) foot vertical. - Allow vertical slopes from bottom of trench to six (6) above pipe if using CLSM backfill. 123(d)(20). The material shall be compacted to ninety (90) percent per ASTM 1557 which would imply soil. We propose to use CLSM backfill from invert of pipe to six (6) inches above pipe.	123(d)(7). The Design includes a positive closure device located on the waterside edge of levee crown. DWR ULDC requires a closure device to be located at the waterside hinge. The variance shall allow our project to meet DWR ULDC criteria without having two gate/butterfly valves on the pipeline resulting in increased head and O&M. 123(d)(9). We propose to use CLSM backfill to six (6) above pipe at which time we will meet the slope requirement. No sloping is proposed below this location. This variance is for the portion below the DWSE. This is the standard of practice in the field and on previous flood control projects. Sloping of the trench would result in a substantial increase in CLSM backfill with no real benefit. 123(d)(20). We propose to use CLSM backfill from invert of pipe to six (6) inches above pipe. - CLSM has been approved and in some cases required on pervious projects. The variance will clarify that CLSM is an acceptable backfill and no compaction shall be required. CLSM is the standard of practice and has been a requirement on some CVFPB permits.
16/17	1080+00	Reach 16/17 Transition		
16	1043+45	To install a 36 Inch discharge pipe through right bank of Feather River.	123(d)(7). Pipelines carrying gas or fluids under pressure must have a readily accessible rapid closure device located within ten (10) of the landside levee toe - All readily accessible rapid closure device to be located at waterside hinge of levee. 123(d)(9). The side slopes of trenches excavated for the installation of pipeline, conduit, or utility lines may not be steeper than one (1) horizontal to one (1) foot vertical. - Allow vertical slopes from bottom of trench to six (6) above pipe if using CLSM backfill. 123(d)(20). The material shall be compacted to ninety (90) percent per ASTM 1557 which would imply soil. We propose to use CLSM backfill from invert of pipe to six (6) inches above pipe. 123(d)(11). The minimum cover for pipelines installed through the levee crown is twenty-four (24) inches. - All the existing pipe to remain with the current amount of cover regardless if less than 24 inches.	123(d)(7). The Design includes a positive closure device located on the waterside edge of levee crown. DWR ULDC requires a closure device to be located at the waterside hinge. The variance shall allow our project to meet DWR ULDC criteria without having two gate/butterfly valves on the pipeline resulting in increased head and O&M. 123(d)(9). We propose to use CLSM backfill to six (6) above pipe at which time we will meet the slope requirement. No sloping is proposed below this location. This variance is for the portion below the DWSE. This is the standard of practice in the field and on previous flood control projects. Sloping of the trench would result in a substantial increase in CLSM backfill with no real benefit. 123(d)(20). We propose to use CLSM backfill from invert of pipe to six (6) inches above pipe. - CLSM has been approved and in some cases required on pervious projects. The variance will clarify that CLSM is an acceptable backfill and no compaction shall be required. CLSM is the standard of practice and has been a requirement on some CVFPB permits. 123(d)(11). This is a no geotechnical work reach and an existing permitted encroachment reconstructed by USACE in 1998. Our scope of work is to provide the positive closure device. We do not propose to pothole and modify the levee crown. CVFPB should issue a NOV to address this issue if a concern.
16	1043+27	To install a 24 inch wrapped steel pipe through the right bank levee of the Feather River	123(d)(7). Pipelines carrying gas or fluids under pressure must have a readily accessible rapid closure device located within ten (10) of the landside levee toe - All readily accessible rapid closure device to be located at waterside hinge of levee. 123(d)(9). The side slopes of trenches excavated for the installation of pipeline, conduit, or utility lines may not be steeper than one (1) horizontal to one (1) foot vertical. - Allow vertical slopes from bottom of trench to six (6) above pipe if using CLSM backfill. 123(d)(20). The material shall be compacted to ninety (90) percent per ASTM 1557 which would imply soil. We propose to use CLSM backfill from invert of pipe to six (6) inches above pipe. 123(d)(11). The minimum cover for pipelines installed through the levee crown is twenty-four (24) inches. - All the existing pipe to remain with the current amount of cover regardless if less than 24 inches.	123(d)(7). The Design includes a positive closure device located on the waterside edge of levee crown. DWR ULDC requires a closure device to be located at the waterside hinge. The variance shall allow our project to meet DWR ULDC criteria without having two gate/butterfly valves on the pipeline resulting in increased head and O&M. 123(d)(9). We propose to use CLSM backfill to six (6) above pipe at which time we will meet the slope requirement. No sloping is proposed below this location. This variance is for the portion below the DWSE. This is the standard of practice in the field and on previous flood control projects. Sloping of the trench would result in a substantial increase in CLSM backfill with no real benefit. 123(d)(20). We propose to use CLSM backfill from invert of pipe to six (6) inches above pipe. - CLSM has been approved and in some cases required on pervious projects. The variance will clarify that CLSM is an acceptable backfill and no compaction shall be required. CLSM is the standard of practice and has been a requirement on some CVFPB permits. 123(d)(11). This is a no geotechnical work reach and an existing permitted encroachment reconstructed by USACE in 1998. Our scope of work is to provide the positive closure device. We do not propose to pothole and modify the levee crown. CVFPB should issue a NOV to address this issue if a concern.

LEVEE ENCROACHMENT LIST

SBFCA Reach	SBFCA STA	Encroachment	Title 23 Variances	Title 23 Variances - Justification
16	1043+22	To construct a 24 inch steel pipe storm drainage discharge pipe crossing the west levee of the Feather River	123(d)(7). Pipelines carrying gas or fluids under pressure must have a readily accessible rapid closure device located within ten (10) of the landside levee toe - All readily accessible rapid closure device to be located at waterside hinge of levee. 123(d)(9). The side slopes of trenches excavated for the installation of pipeline, conduit, or utility lines may not be steeper than one (1) horizontal to one (1) foot vertical. - Allow vertical slopes from bottom of trench to six (6) above pipe if using CLSM backfill. 123(d)(20). The material shall be compacted to ninety (90) percent per ASTM 1557 which would imply soil. We propose to use CLSM backfill from invert of pipe to six (6) inches above pipe. 123(d)(11). The minimum cover for pipelines installed through the levee crown is twenty-four (24) inches. - All the existing pipe to remain with the current amount of cover regardless if less than 24 inches.	123(d)(7). The Design includes a positive closure device located on the waterside edge of levee crown. DWR ULDC requires a closure device to be located at the waterside hinge. The variance shall allow our project to meet DWR ULDC criteria without having two gate/butterfly valves on the pipeline resulting in increased head and O&M. 123(d)(9). We propose to use CLSM backfill to six (6) above pipe at which time we will meet the slope requirement. No sloping is proposed below this location. This variance is for the portion below the DWSE. This is the standard of practice in the field and on previous flood control projects. Sloping of the trench would result in a substantial increase in CLSM backfill with no real benefit. 123(d)(20). We propose to use CLSM backfill from invert of pipe to six (6) inches above pipe. - CLSM has been approved and in some cases required on pervious projects. The variance will clarify that CLSM is an acceptable backfill and no compaction shall be required. CLSM is the standard of practice and has been a requirement on some CVFPB permits. 123(d)(11). This is a no geotechnical work reach and an existing permitted encroachment reconstructed by USACE in 1998. Our scope of work is to provide the positive closure device. We do not propose to pothole and modify the levee crown. CVFPB should issue a NOV to address this issue if a concern.
16	1043+03	Gilsizer Slough Storm Drain Facilities. A 16 inch welded steel discharge pipe crossing of levee. (copy of record drawings)	123(d)(7). Pipelines carrying gas or fluids under pressure must have a readily accessible rapid closure device located within ten (10) of the landside levee toe - All readily accessible rapid closure device to be located at waterside hinge of levee. 123(d)(9). The side slopes of trenches excavated for the installation of pipeline, conduit, or utility lines may not be steeper than one (1) horizontal to one (1) foot vertical. - Allow vertical slopes from bottom of trench to six (6) above pipe if using CLSM backfill. 123(d)(20). The material shall be compacted to ninety (90) percent per ASTM 1557 which would imply soil. We propose to use CLSM backfill from invert of pipe to six (6) inches above pipe. 123(d)(11). The minimum cover for pipelines installed through the levee crown is twenty-four (24) inches. - All the existing pipe to remain with the current amount of cover regardless if less than 24 inches.	123(d)(7). The Design includes a positive closure device located on the waterside edge of levee crown. DWR ULDC requires a closure device to be located at the waterside hinge. The variance shall allow our project to meet DWR ULDC criteria without having two gate/butterfly valves on the pipeline resulting in increased head and O&M. 123(d)(9). We propose to use CLSM backfill to six (6) above pipe at which time we will meet the slope requirement. No sloping is proposed below this location. This variance is for the portion below the DWSE. This is the standard of practice in the field and on previous flood control projects. Sloping of the trench would result in a substantial increase in CLSM backfill with no real benefit. 123(d)(20). We propose to use CLSM backfill from invert of pipe to six (6) inches above pipe. - CLSM has been approved and in some cases required on pervious projects. The variance will clarify that CLSM is an acceptable backfill and no compaction shall be required. CLSM is the standard of practice and has been a requirement on some CVFPB permits. 123(d)(11). This is a no geotechnical work reach and an existing permitted encroachment reconstructed by USACE in 1998. Our scope of work is to provide the positive closure device. We do not propose to pothole and modify the levee crown. CVFPB should issue a NOV to address this issue if a concern.
16	972+29	2 Inch Domestic Water Line serving the Yuba City Boat Dock.	123(d)(7). Pipelines carrying gas or fluids under pressure must have a readily accessible rapid closure device located within ten (10) of the landside levee toe - All readily accessible rapid closure device to be located at waterside hinge of levee. 123(d)(9). The side slopes of trenches excavated for the installation of pipeline, conduit, or utility lines may not be steeper than one (1) horizontal to one (1) foot vertical. - Allow vertical slopes from bottom of trench to six (6) above pipe if using CLSM backfill. 123(d)(20). The material shall be compacted to ninety (90) percent per ASTM 1557 which would imply soil. We propose to use CLSM backfill from invert of pipe to six (6) inches above pipe.	123(d)(7). The Design includes a positive closure device located on the waterside edge of levee crown. DWR ULDC requires a closure device to be located at the waterside hinge. The variance shall allow our project to meet DWR ULDC criteria without having two gate/butterfly valves on the pipeline resulting in increased head and O&M. 123(d)(9). We propose to use CLSM backfill to six (6) above pipe at which time we will meet the slope requirement. No sloping is proposed below this location. This variance is for the portion below the DWSE. This is the standard of practice in the field and on previous flood control projects. Sloping of the trench would result in a substantial increase in CLSM backfill with no real benefit. 123(d)(20). We propose to use CLSM backfill from invert of pipe to six (6) inches above pipe. - CLSM has been approved and in some cases required on pervious projects. The variance will clarify that CLSM is an acceptable backfill and no compaction shall be required. CLSM is the standard of practice and has been a requirement on some CVFPB permits.
15/16	968+50	Reach 15/16 Transition		
14/15	954+40	Reach 14/15 Transition		
13/14	927+00	Reach 13/14 Transition		

LEVEE ENCROACHMENT LIST

SBFCA Reach	SBFCA STA	Encroachment	Title 23 Variances	Title 23 Variances - Justification
13	893+84	Garden Highway Industrial Park. To install a 12 inch steel storm drain pipeline through the right bank levee of the Feather River (Source: City of Yuba City Pump Station No. 1)	123(d)(7). Pipelines carrying gas or fluids under pressure must have a readily accessible rapid closure device located within ten (10) of the landside levee toe - All readily accessible rapid closure device to be located at waterside hinge of levee. 123(d)(9). The side slopes of trenches excavated for the installation of pipeline, conduit, or utility lines may not be steeper than one (1) horizontal to one (1) foot vertical. - Allow vertical slopes from bottom of trench to six (6) above pipe if using CLSM backfill. 123(d)(20). The material shall be compacted to ninety (90) percent per ASTM 1557 which would imply soil. We propose to use CLSM backfill from invert of pipe to six (6) inches above pipe.	123(d)(7). The Design includes a positive closure device located on the waterside edge of levee crown. DWR ULDC requires a closure device to be located at the waterside hinge. The variance shall allow our project to meet DWR ULDC criteria without having two gate/butterfly valves on the pipeline resulting in increased head and O&M. 123(d)(9). We propose to use CLSM backfill to six (6) above pipe at which time we will meet the slope requirement. No sloping is proposed below this location. This variance is for the portion below the DWSE. This is the standard of practice in the field and on previous flood control projects. Sloping of the trench would result in a substantial increase in CLSM backfill with no real benefit. 123(d)(20). We propose to use CLSM backfill from invert of pipe to six (6) inches above pipe. - CLSM has been approved and in some cases required on pervious projects. The variance will clarify that CLSM is an acceptable backfill and no compaction shall be required. CLSM is the standard of practice and has been a requirement on some CVFPB permits.
13	893+78	Burns Drive Storm Water Pump Station. 16 inch steel storm drain discharge pipe through levee. (Source: City of Yuba City Pump Station No. 1)	123(d)(7). Pipelines carrying gas or fluids under pressure must have a readily accessible rapid closure device located within ten (10) of the landside levee toe - All readily accessible rapid closure device to be located at waterside hinge of levee. 123(d)(9). The side slopes of trenches excavated for the installation of pipeline, conduit, or utility lines may not be steeper than one (1) horizontal to one (1) foot vertical. - Allow vertical slopes from bottom of trench to six (6) above pipe if using CLSM backfill. 123(d)(20). The material shall be compacted to ninety (90) percent per ASTM 1557 which would imply soil. We propose to use CLSM backfill from invert of pipe to six (6) inches above pipe.	123(d)(7). The Design includes a positive closure device located on the waterside edge of levee crown. DWR ULDC requires a closure device to be located at the waterside hinge. The variance shall allow our project to meet DWR ULDC criteria without having two gate/butterfly valves on the pipeline resulting in increased head and O&M. 123(d)(9). We propose to use CLSM backfill to six (6) above pipe at which time we will meet the slope requirement. No sloping is proposed below this location. This variance is for the portion below the DWSE. This is the standard of practice in the field and on previous flood control projects. Sloping of the trench would result in a substantial increase in CLSM backfill with no real benefit. 123(d)(20). We propose to use CLSM backfill from invert of pipe to six (6) inches above pipe. - CLSM has been approved and in some cases required on pervious projects. The variance will clarify that CLSM is an acceptable backfill and no compaction shall be required. CLSM is the standard of practice and has been a requirement on some CVFPB permits.
13	881+40	Levee District No. 1 Relief Well Pump Station 6" pipes located just southeast of the Waste Water Treatment Plant. The waterside outlet structure has cobbles and the flap gate is damaged or plugged. CVFPB sent a notice of encroachment violation on August 16, 2011 to Sutter County.	123(d)(7). Pipelines carrying gas or fluids under pressure must have a readily accessible rapid closure device located within ten (10) of the landside levee toe - All readily accessible rapid closure device to be located at waterside hinge of levee. 123(d)(9). The side slopes of trenches excavated for the installation of pipeline, conduit, or utility lines may not be steeper than one (1) horizontal to one (1) foot vertical. - Allow vertical slopes from bottom of trench to six (6) above pipe if using CLSM backfill. 123(d)(20). The material shall be compacted to ninety (90) percent per ASTM 1557 which would imply soil. We propose to use CLSM backfill from invert of pipe to six (6) inches above pipe.	123(d)(7). The Design includes a positive closure device located on the waterside edge of levee crown. DWR ULDC requires a closure device to be located at the waterside hinge. The variance shall allow our project to meet DWR ULDC criteria without having two gate/butterfly valves on the pipeline resulting in increased head and O&M. 123(d)(9). We propose to use CLSM backfill to six (6) above pipe at which time we will meet the slope requirement. No sloping is proposed below this location. This variance is for the portion below the DWSE. This is the standard of practice in the field and on previous flood control projects. Sloping of the trench would result in a substantial increase in CLSM backfill with no real benefit. 123(d)(20). We propose to use CLSM backfill from invert of pipe to six (6) inches above pipe. - CLSM has been approved and in some cases required on pervious projects. The variance will clarify that CLSM is an acceptable backfill and no compaction shall be required. CLSM is the standard of practice and has been a requirement on some CVFPB permits.
13	881+43	Levee District No. 1 Relief Well Pump Station 14" pipes located just southeast of the Waste Water Treatment Plant. The waterside outlet structure has cobbles and the flap gate is damaged or plugged. CVFPB sent a notice of encroachment violation on August 16, 2011 to Sutter County.	123(d)(7). Pipelines carrying gas or fluids under pressure must have a readily accessible rapid closure device located within ten (10) of the landside levee toe - All readily accessible rapid closure device to be located at waterside hinge of levee. 123(d)(9). The side slopes of trenches excavated for the installation of pipeline, conduit, or utility lines may not be steeper than one (1) horizontal to one (1) foot vertical. - Allow vertical slopes from bottom of trench to six (6) above pipe if using CLSM backfill. 123(d)(20). The material shall be compacted to ninety (90) percent per ASTM 1557 which would imply soil. We propose to use CLSM backfill from invert of pipe to six (6) inches above pipe.	123(d)(7). The Design includes a positive closure device located on the waterside edge of levee crown. DWR ULDC requires a closure device to be located at the waterside hinge. The variance shall allow our project to meet DWR ULDC criteria without having two gate/butterfly valves on the pipeline resulting in increased head and O&M. 123(d)(9). We propose to use CLSM backfill to six (6) above pipe at which time we will meet the slope requirement. No sloping is proposed below this location. This variance is for the portion below the DWSE. This is the standard of practice in the field and on previous flood control projects. Sloping of the trench would result in a substantial increase in CLSM backfill with no real benefit. 123(d)(20). We propose to use CLSM backfill from invert of pipe to six (6) inches above pipe. - CLSM has been approved and in some cases required on pervious projects. The variance will clarify that CLSM is an acceptable backfill and no compaction shall be required. CLSM is the standard of practice and has been a requirement on some CVFPB permits.

LEVEE ENCROACHMENT LIST

SBFCA Reach	SBFCA STA	Encroachment	Title 23 Variances	Title 23 Variances - Justification
13	856+23	South Yuba City Seepage Interceptor Pump Station 24 inch 7 GA Steel Pipe asphalt coated and wrapped with asphalt saturated felt discharge pipe (Source: City of Yuba City Pump Station No. ?)	123(d)(7). Pipelines carrying gas or fluids under pressure must have a readily accessible rapid closure device located within ten (10) of the landside levee toe - All readily accessible rapid closure device to be located at waterside hinge of levee. 123(d)(9). The side slopes of trenches excavated for the installation of pipeline, conduit, or utility lines may not be steeper than one (1) horizontal to one (1) foot vertical. - Allow vertical slopes from bottom of trench to six (6) above pipe if using CLSM backfill. 123(d)(20). The material shall be compacted to ninety (90) percent per ASTM 1557 which would imply soil. We propose to use CLSM backfill from invert of pipe to six (6) inches above pipe.	123(d)(7). The Design includes a positive closure device located on the waterside edge of levee crown. DWR ULDC requires a closure device to be located at the waterside hinge. The variance shall allow our project to meet DWR ULDC criteria without having two gate/butterfly valves on the pipeline resulting in increased head and O&M. 123(d)(9). We propose to use CLSM backfill to six (6) above pipe at which time we will meet the slope requirement. No sloping is proposed below this location. This variance is for the portion below the DWSE. This is the standard of practice in the field and on previous flood control projects. Sloping of the trench would result in a substantial increase in CLSM backfill with no real benefit. 123(d)(20). We propose to use CLSM backfill from invert of pipe to six (6) inches above pipe. - CLSM has been approved and in some cases required on pervious projects. The variance will clarify that CLSM is an acceptable backfill and no compaction shall be required. CLSM is the standard of practice and has been a requirement on some CVFPB permits.
13	856+08	South Yuba City Storm Drainage Pump Station 24 inch 7 GA Steel Pipe asphalt coated and wrapped with asphalt saturated felt discharge pipe (Source: City of Yuba City Pump Station No. 3)	123(d)(7). Pipelines carrying gas or fluids under pressure must have a readily accessible rapid closure device located within ten (10) of the landside levee toe - All readily accessible rapid closure device to be located at waterside hinge of levee. 123(d)(9). The side slopes of trenches excavated for the installation of pipeline, conduit, or utility lines may not be steeper than one (1) horizontal to one (1) foot vertical. - Allow vertical slopes from bottom of trench to six (6) above pipe if using CLSM backfill. 123(d)(20). The material shall be compacted to ninety (90) percent per ASTM 1557 which would imply soil. We propose to use CLSM backfill from invert of pipe to six (6) inches above pipe.	123(d)(7). The Design includes a positive closure device located on the waterside edge of levee crown. DWR ULDC requires a closure device to be located at the waterside hinge. The variance shall allow our project to meet DWR ULDC criteria without having two gate/butterfly valves on the pipeline resulting in increased head and O&M. 123(d)(9). We propose to use CLSM backfill to six (6) above pipe at which time we will meet the slope requirement. No sloping is proposed below this location. This variance is for the portion below the DWSE. This is the standard of practice in the field and on previous flood control projects. Sloping of the trench would result in a substantial increase in CLSM backfill with no real benefit. 123(d)(20). We propose to use CLSM backfill from invert of pipe to six (6) inches above pipe. - CLSM has been approved and in some cases required on pervious projects. The variance will clarify that CLSM is an acceptable backfill and no compaction shall be required. CLSM is the standard of practice and has been a requirement on some CVFPB permits.
12/13	845+00	Reach 12/13 Transition		

Sutter Butte Flood Control Agency
Post Office Box M
Yuba City, CA 95991
(530) 755-9859

sutterbutteflood.org

COUNTIES
Butte County
Sutter County

CITIES
City of Biggs
City of Gridley
City of Live Oak
City of Yuba City

LEVEE DISTRICTS
Levee District 1
Levee District 9

April 28, 2016

Ms. Nancy Moricz, Senior Engineer
Central Valley Flood Protection Board
3310 El Camino Avenue, Ste. LL40
Sacramento, CA 95821

Subject: Title 23 Variance Request – Project Area C Gaps Projects

Dear Ms. Moricz,

Levee work is proposed to be constructed under a Modified Permit No.18793-1 BD to address "gaps" in the Project C cutoff wall and is anticipated to begin this summer. The Sutter Butte Flood Control Agency (SBFCA) respectfully requests a variance to Title 23 standards based on Title 23, § 11(b), Variances, as outlined below. The request is based on grounds that the Board's standards are infeasible for elements of these specific projects due to various site conditions, funding, and other constraints as detailed below. SBFCA also requests that improvements outside CVFPB jurisdiction (i.e. proposed drainage improvements proposed more than 30 feet from the landside levee toe) not be required to comply with Title 23 requirements since they are being designed to meet City of Yuba City standards.

Title 23 § 123 Pipelines, Conduits, and Utility Lines

Variance Request #1: SBFCA proposes to allow the Contractor an option of using CLSM backfill from the invert of the pipe to six (6) inches above the pipe for the proposed modifications of existing pipelines. SBFCA also proposes to use CLSM backfill for the proposed relief well discharge pipes, as shown on the design drawings. CLSM strength and permeability are proposed in the specifications, and correspond to those used elsewhere in Project C except the permeability has been increased to $1x10^{-5}$ cm/sec from $1x10^{-6}$ cm/sec and the 28 day time period has been removed. Finally, SBFCA proposes to use CLSM meeting Yuba City requirements for storm drainage improvements outside CVFPB jurisdiction.

Justification for Request #1: CLSM has been approved and in some cases required on previous projects. CLSM is also standard practice and has been a requirement on other CVFPB permits. The variance will allow CLSM as an acceptable backfill without compaction which would avoid the difficult and infeasible method of trying to backfill type 1 material under and around a pipe on a levee slope while meeting acceptable compaction specifications. The goal of the CLSM permeability is to meet or exceed the levee embankment material. A permeability requirement of $1x10^{-6}$ cm/sec with a maximum strength requirement 500 psi has been demonstrated to be very hard to meet elsewhere on Project C. Increasing the permeability to $1x10^{-5}$ cm/sec will allow the

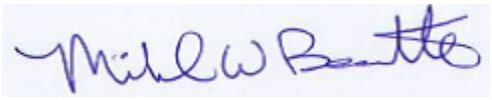
Contractor to lower the strength and still meet the permeability. We feel a permeability of $1x10^{-5}$ cm/sec would be similar to using Type 2 Levee Embankment.

Variance Request #2: SBFCA proposes the use of AWWA C213 epoxy lined pipe for pipes less than 18 inches.

Justification for the Request #2: The use of cement or mortar lined pipe is problematic on smaller diameter pipes and is therefore infeasible in this case. Epoxy lined pipe is used on domestic water lines and SBFCA feels it meets the goal of protective liner for corrosive material.

Please contact me at: (916) 679-8861 or m.bessette@sutterbutteflood.org if you have any questions regarding this request.

Sincerely,



Michael W. Bessette, P.E.
Director of Engineering
Sutter Butte Flood Control Agency

cc: Simar Dhanota - DWR
Jim Lorenzen - Parson Brinckerhoff
Jonathan Kors - Wood Rodgers
Peter Blum - Wood Rodgers
Chris Krivanec - HDR
Daniel Jabbour - HDR

Williams, David R.@DWR

From: Perlea, Mary P SPK <Mary.P.Perlea@usace.army.mil>
Sent: Wednesday, October 02, 2013 11:18 AM
To: Punia, Jay@DWR
Cc: Marino, Len@DWR; Williams, David R.@DWR; Larson, Ryan T SPK
Subject: Feather River West Levee Project, Project Construction and Design Changes (UNCLASSIFIED)

Classification: UNCLASSIFIED
Caveats: NONE

Jay

We reviewed your letter to Col. Farrell regarding changes in design and construction of the Feather River west bank improvement project. The modifications n the backfill specification are as follows: (1) increase the particle size from maximum 3 inches to maximum 8 inches in the reconstruction of the levee outside the impervious core, (2) increase the maximum lift thickness of soil layers placed in the reconstruction of the levee outside the impervious core from 6 inches to 12 inches, and (3) use of a method specification to achieve minimum relative density of levee backfill in lieu of ASTM testing methods.

Based on the provided documentation we have no objections to the proposed modification, the levee integrity will not be affected by the proposed modification and therefore there are no technical objections if the following conditions are met:

The specification requirements of minimum 60% should be kept
The ASTM testing requirements in the specification should be respected
The topsoil should be placed on the upper landside slope as shown on the drawings and specifications. The topsoil should be imported as initially specified.

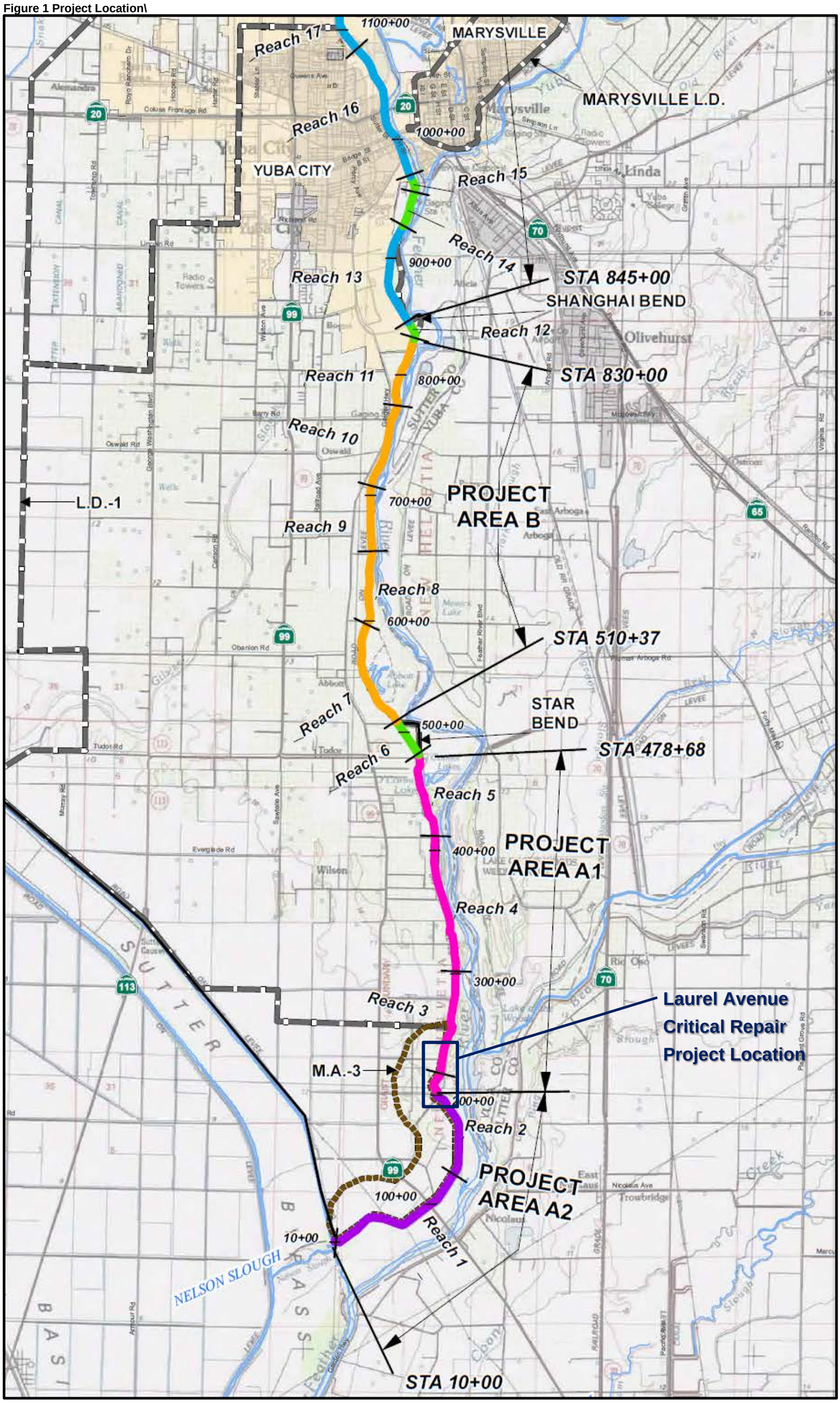
Please include the modification to the contract specifications in the final construction documents for the 408 project as needed.

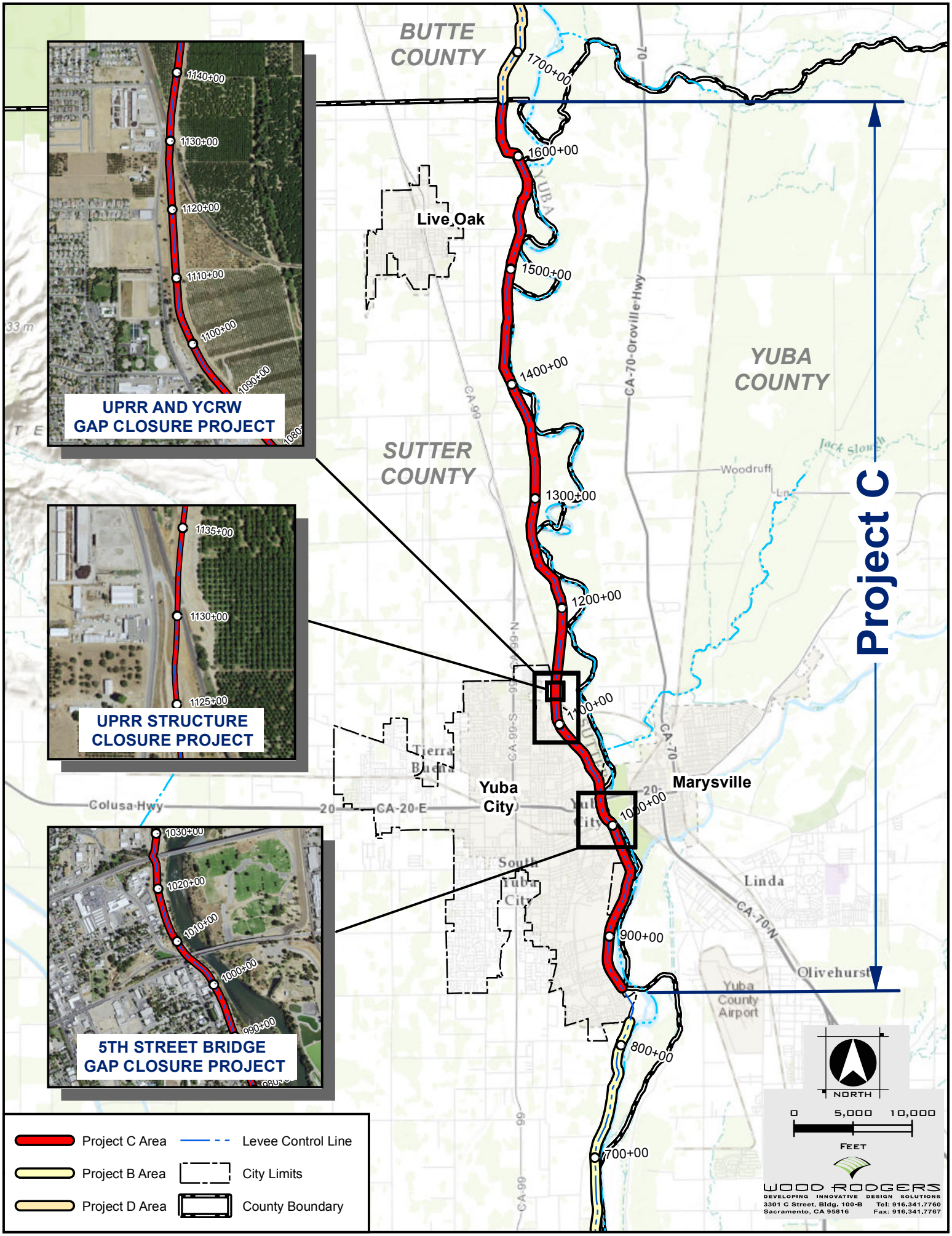
We will prepare an official response letter if it is necessary, until than please allow the Contractor to reconstruct the levee as proposed in the modification letter.

Mary Perlea
Levee Safety Program Manager
Corps of Engineers
Sacramento District, Geotechnical Branch
1325 J Street
Sacramento, CA 95814
Phone: (916) 557-7185
Cell: (916) 425-8352

Classification: UNCLASSIFIED
Caveats: NONE

Figure 1 Project Location




BUTTE COUNTY
SUTTER COUNTY
YUBA COUNTY
Live Oak
Yuba City
Marysville
Tierra Buena
South Yuba City
Linda
Olivehurst
Woodruff Ln
Yuba County Airport
Colusa Hwy
CA-20-E
CA-99
CA-70-Oroville Hwy
CA-70
CA-70-N
Project C
1700+00
1600+00
1500+00
1400+00
1300+00
1200+00
1100+00
1000+00
900+00
800+00
700+00
1140+00
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1090+00
1135+00
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1020+00
1010+00
1000+00
990+00
UPRR AND YCRW GAP CLOSURE PROJECT
UPRR STRUCTURE CLOSURE PROJECT
5TH STREET BRIDGE GAP CLOSURE PROJECT
Project C Area
Project B Area
Project D Area
Levee Control Line
City Limits
County Boundary
NORTH
0
5,000
10,000
FEET
WOOD RODGERS
DEVELOPING INNOVATIVE DESIGN SOLUTIONS
3301 C Street, Bldg. 100-B
Sacramento, CA 95816
Tel: 916.341.7760
Fax: 916.341.7767

5th Street Bridge Plan and Sections

100% DESIGN

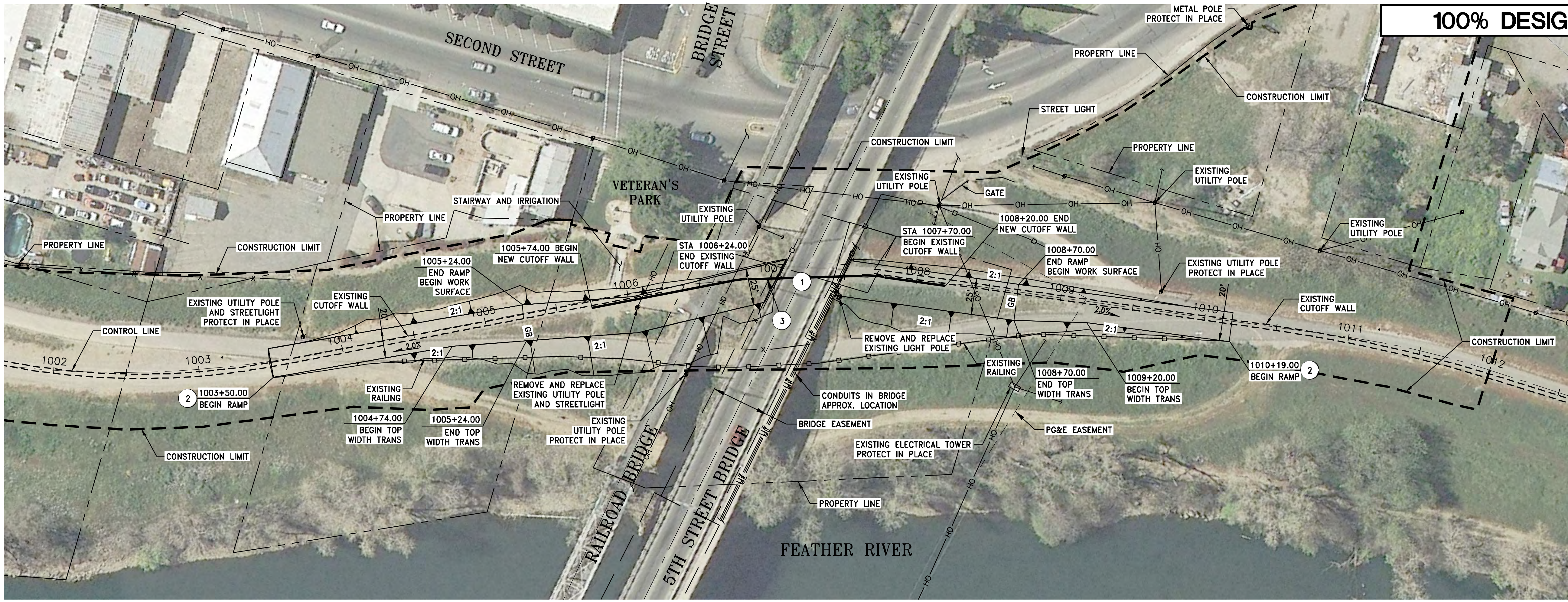
CONSTRUCTION NOTES:

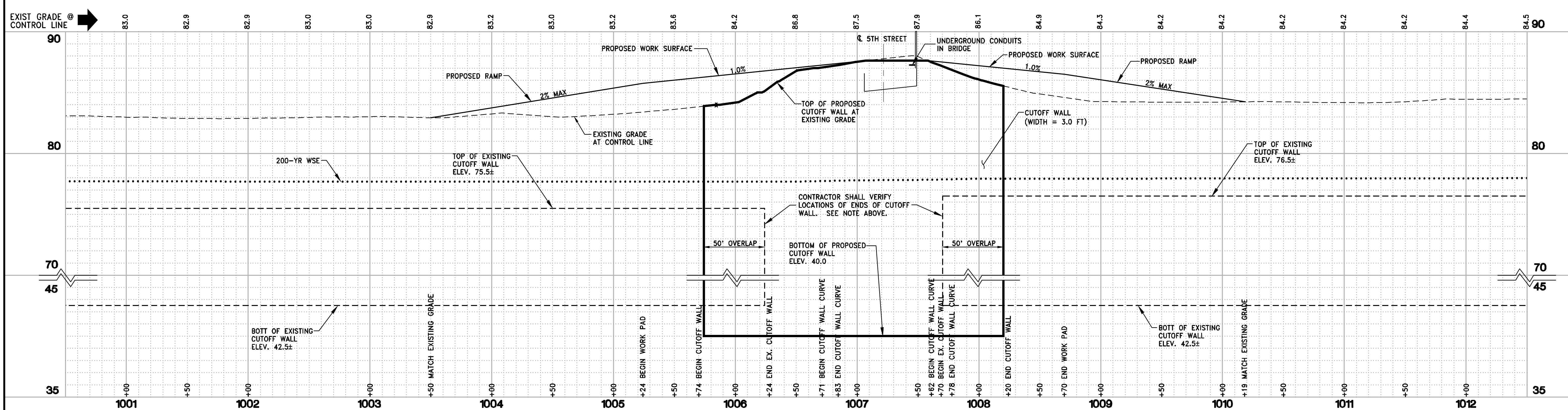
1. FOR CLOSURE STRUCTURE CONSTRUCTION SEQUENCE, SEE DETAIL DWG C-301
2. PROPOSED RAMP AND WORK SURFACE TO BE CONSTRUCTED USING RANDOM FILL AND TO BE REMOVED BY THE CONTRACTOR AFTER CONSTRUCTION.
3. CUTOFF WALL EXCAVATOR MUST BE SET BACK A MINIMUM OF 6' FROM THE WING WALL ON THE SOUTH SIDE OF 5TH STREET BRIDGE.

NOTE:
THE ENDS OF THE EXISTING CUTOFF WALL ARE BASED ON DESIGN INFORMATION PROVIDED IN THE SACRAMENTO RIVER FLOOD CONTROL PROJECT PHASE II, LEVEE RECONSTRUCTION, CONTRACT 3 (SITES 1, 8, 9, 10, 11, & 12) PLANS PROVIDED BY SUTTER COUNTY. THE CONTRACTOR SHALL VERIFY THE ACTUAL LOCATIONS OF THE ENDS OF THE EXISTING CUTOFF WALL.

HORIZ SCALE: 1" = 40'

VERT SCALE: 1" = 4'





REV.	DATE	BY	CHK.	APPR.	DESCRIPTION	REV.	DATE	BY	CHK.	APPR.	DESCRIPTION

DESIGNED BY: P. BLUM, E. EYSTER
DRAWN BY: J. PRIEST
CHECKED BY: J. CHAPMAN
IN CHARGE: J. KORS
DATE: 03/13/2015

PRELIMINARY

WOOD RODGERS
DEVELOPING • INNOVATIVE • DESIGN • SOLUTIONS
3301 C STREET, BLDG. 100-B, SACRAMENTO, CA 95816
PHONE: (916) 341-7760 FAX: (916) 341-7767

SUBMITTED | APPROVED

SUTTER BUTTE FLOOD CONTROL AGENCY

FEATHER RIVER WEST LEVEE PROJECT
5TH STREET BRIDGE GAP CLOSURE
LEVEE PLAN & PROFILE AT CLOSURE SITE

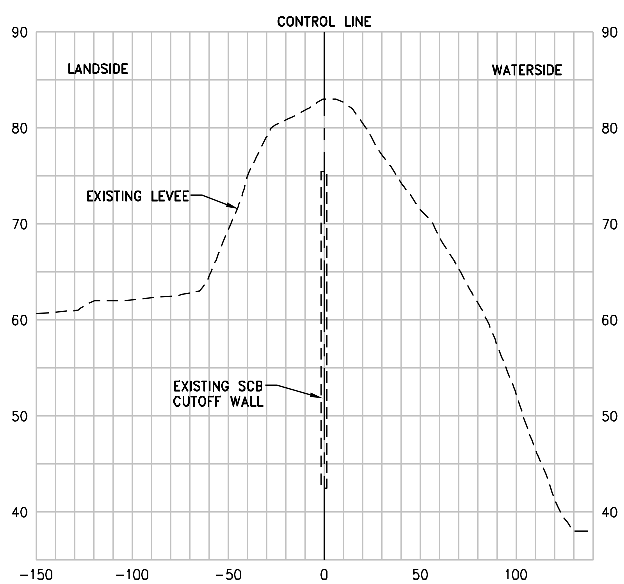
VERIFY SCALES
BAR IS ONE INCH ON ORIGINAL DRAWING, ADJUST SCALES FOR REDUCED PLOTS

DRAWING NO. C-101 | SHEET 10

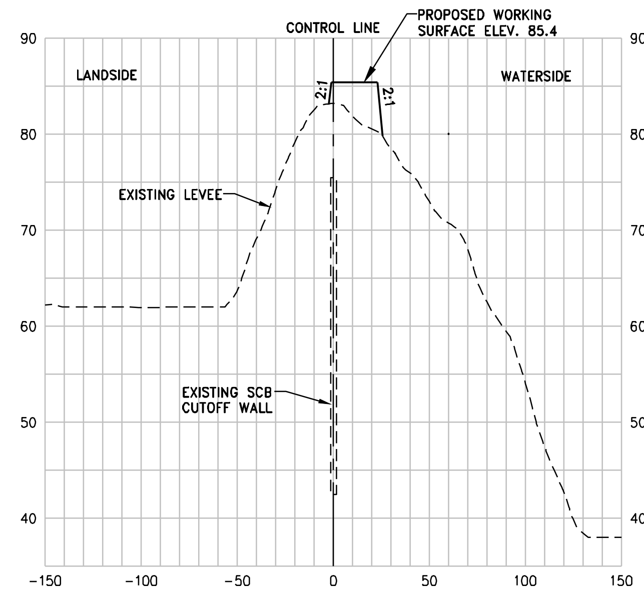
Attachment D - Gap Amendment Design Plans

100% DESIGN

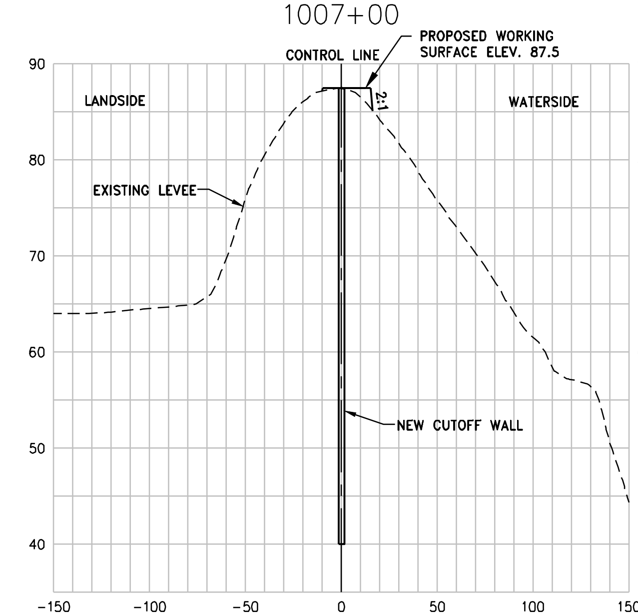
1003+00



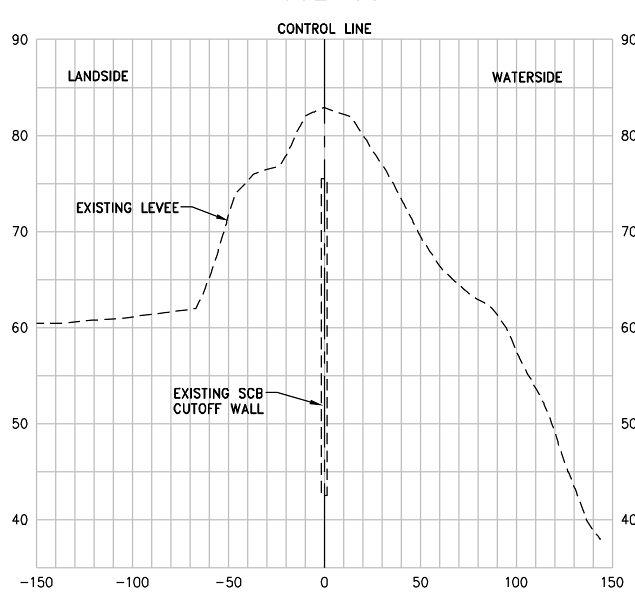
1005+00



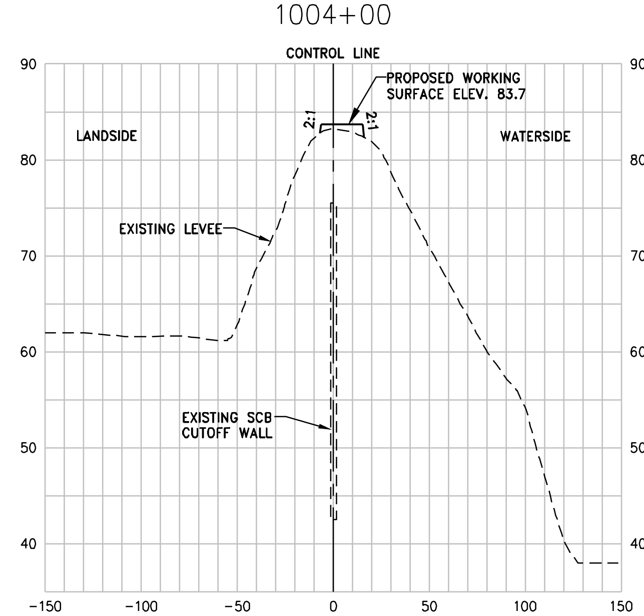
1007+00



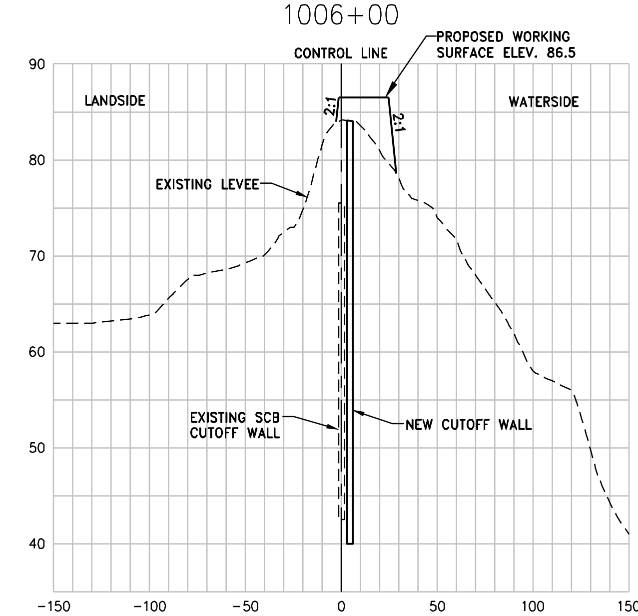
1002+00



1004+00



1006+00



NOTE:

1. FOR BOTTOM OF CUTOFF WALL ELEVATION SEE CUTOFF WALL PROFILE DWG C-401.
2. FOR EXCAVATION LIMITS AND DETAILS SEE TYPICAL SECTION DWGS C-301 TO C-303.

50' 25' 0 50' 100'
HORIZ SCALE: 1" = 50'

10' 5' 0 10' 20'
VERT SCALE: 1" = 10'

REV.	DATE	BY	CHK.	APPR.	DESCRIPTION	REV.	DATE	BY	CHK.	APPR.	DESCRIPTION

DESIGNED BY: P. BLUM, E. EYSTER
DRAWN BY: J. PRIEST
CHECKED BY: J. CHAPMAN
IN CHARGE: J. KORS
DATE: 03/13/2015

PRELIMINARY

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SUBMITTED
APPROVED

SUTTER BUTTE FLOOD CONTROL AGENCY

FEATHER RIVER WEST LEVEE PROJECT
5TH STREET BRIDGE GAP CLOSURE

LEVEE CROSS SECTIONS (STA 1002+00 TO 1007+00)

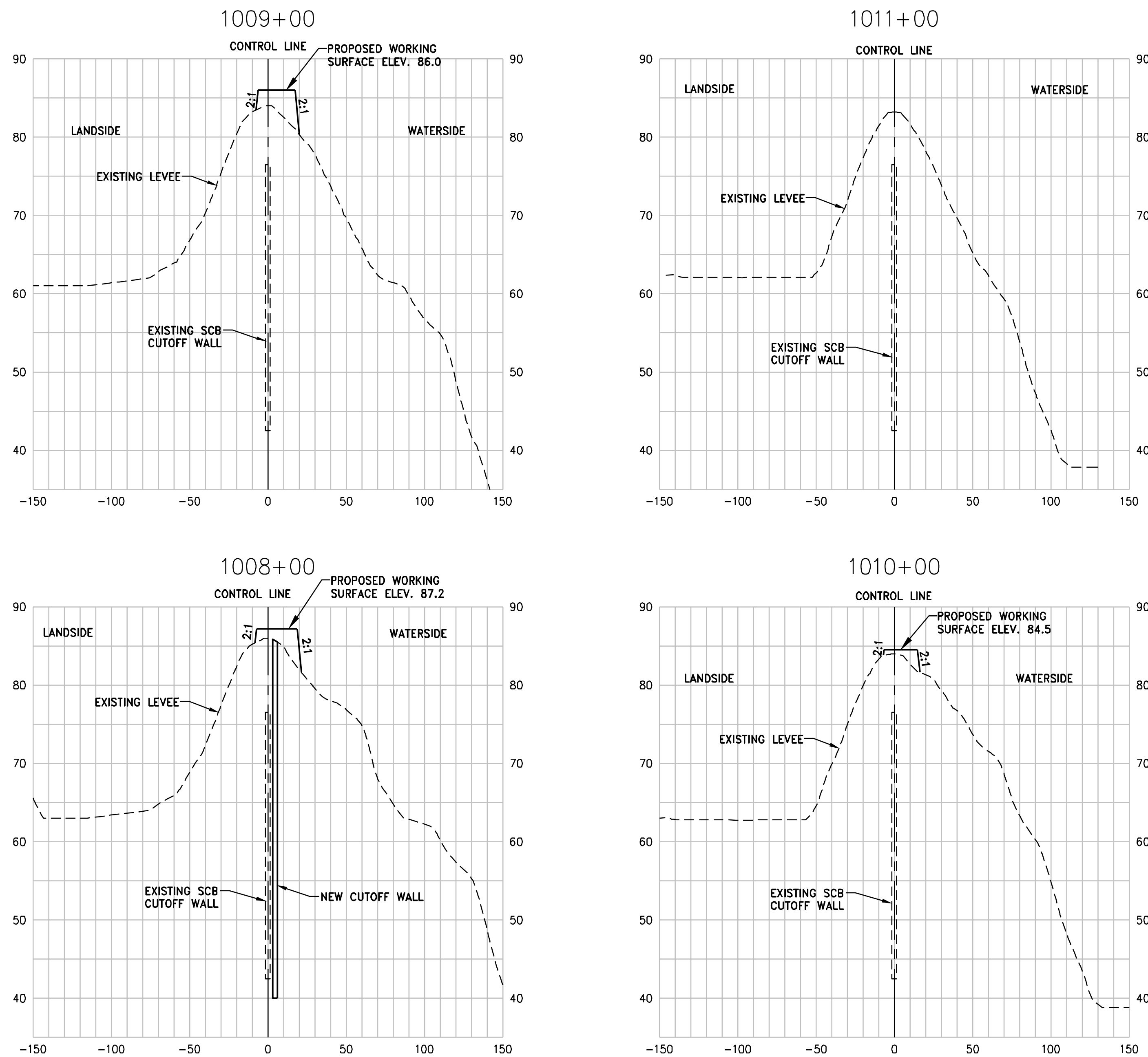
VERIFY SCALES
BAR IS ONE INCH ON ORIGINAL DRAWING, ADJUST SCALES FOR REDUCED PLOTS

DRAWING NO. C-601
SHEET 29

J:\Jobs\8455_HDR_Sutter_Butte_FCA\FRWL_TO10\Civil\Dwg\Gap Closure Plans\5th Street\C_601_XSEC-01_5TH_GAP.dwg 3/12/2015 1:29 PM Evan Eyster

Attachment D - Gap Amendment Design Plans

100% DESIGN



NOTE:

1. FOR BOTTOM OF CUTOFF WALL ELEVATION SEE CUTOFF WALL PROFILE DWG C-401.
2. FOR EXCAVATION LIMITS AND DETAILS SEE TYPICAL SECTION DWGS C-301 TO C-303.

HORIZ SCALE: 1" = 50' (50' 25' 0 50' 100')

VERT SCALE: 1" = 10' (10' 5' 0 10' 20')

REV.	DATE	BY	CHK.	APPR.	DESCRIPTION	REV.	DATE	BY	CHK.	APPR.	DESCRIPTION

DESIGNED BY: P. BLUM, E. EYSTER
DRAWN BY: J. PRIEST
CHECKED BY: J. CHAPMAN
IN CHARGE: J. KORS
DATE: 03/13/2015

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SUBMITTED
APPROVED

SUTTER BUTTE FLOOD CONTROL AGENCY

FEATHER RIVER WEST LEVEE PROJECT
5TH STREET BRIDGE GAP CLOSURE

LEVEE CROSS SECTIONS (STA 1008+00 TO 1011+00)

VERIFY SCALES
BAR IS ONE INCH ON ORIGINAL DRAWING, ADJUST SCALES FOR REDUCED PLOTS
0 1"

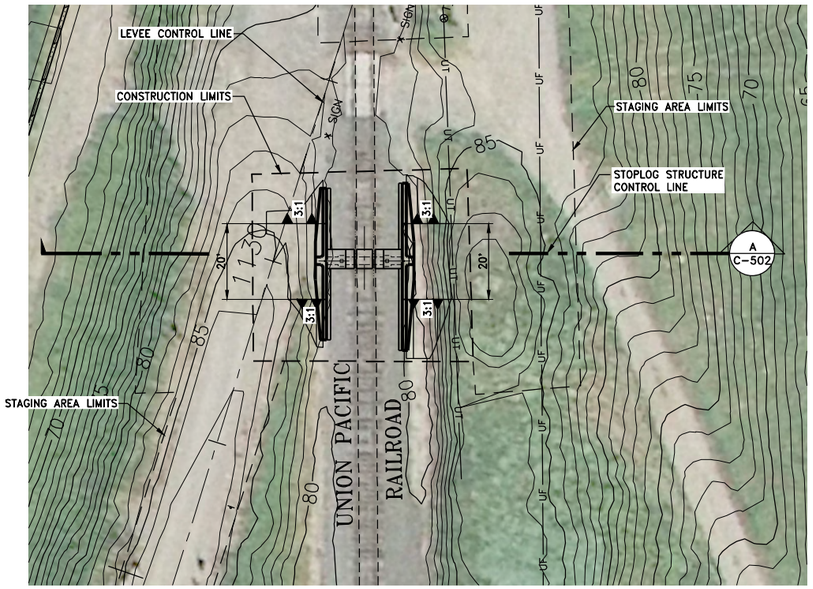
DRAWING NO. C-602
SHEET 30

J:\Jobs\8455_HDR_Sutter_Butte_FCA\FRWL_T010\Civil\Dwg\Gap Closure Plans\5th Street\C_602_XSEC-02_5TH_GAP.dwg 3/12/2015 1:29 PM Evan Eyster

Attachment D - Gap Amendment Design Plans

UPRR Closure Structure Plan and Sections

FOR BID



20' 10' 0 20' 40'

HORIZ SCALE: 1" = 20'

4' 2' 0 4' 8'

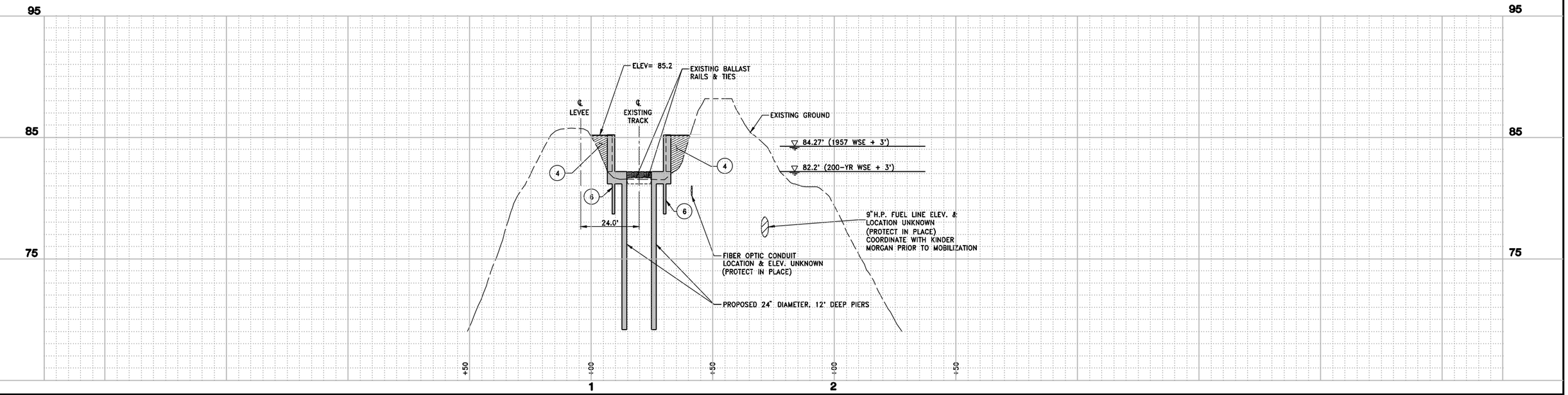
VERT SCALE: 1" = 4'

CONSTRUCTION NOTES:

1. ALL WORK SHALL BE IN ACCORDANCE WITH THE U.P.R.R. PERMIT AND COORDINATED WITH THE U.P.R.R.
2. CONTRACTOR TO REMOVE DEBRIS AS NECESSARY WITHIN THE CONSTRUCTION LIMITS TO FACILITATE CONSTRUCTION
3. CONTRACTOR SHALL INSTALL STOPLOG STRUCTURE FOLLOWING PER DETAILS ON DWGS C-502, C-503, C-504, C-505, AND C-506
4. LEVEE EMBANKMENT FILL (SOIL TYPE 1 AND 2) TO BE PLACED AND COMPACTED AS SHOWN IN DETAIL 7 ON DWG C-506 AND AS SPECIFIED IN SECTION 31 00 00 OF THE PROJECT SPECIFICATIONS.
5. SECTION VIEW IS SCHEMATIC. REFER TO DWG C-502, C-503, C-504, & C-505 FOR LINES, GRADES, AND CONSTRUCTION DETAILS.
6. RETAINING WALL AND FOOTING. SEE DETAIL C, DWG. C-503 FOR DETAILS.

CLOSURE STRUCTURE PLAN (STA 1130+07.22)

SCALE: 1"= 20'



REV.	DATE	BY	CHK.	APPR.	DESCRIPTION

DESIGNED BY: G. MURDOCK
DRAWN BY: J. PATCHETT
CHECKED BY: G. CALVILLO
IN CHARGE: J. KORS
DATE: 06/06/2015

REGISTERED PROFESSIONAL ENGINEER — PRELIMINARY — NOT FOR CONSTRUCTION — STATE OF CALIFORNIA

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SUBMITTED

APPROVED

SUTTER BUTTE FLOOD CONTROL AGENCY

FEATHER RIVER WEST LEVEE PROJECT
UPRR CLOSURE STRUCTURE PLANS

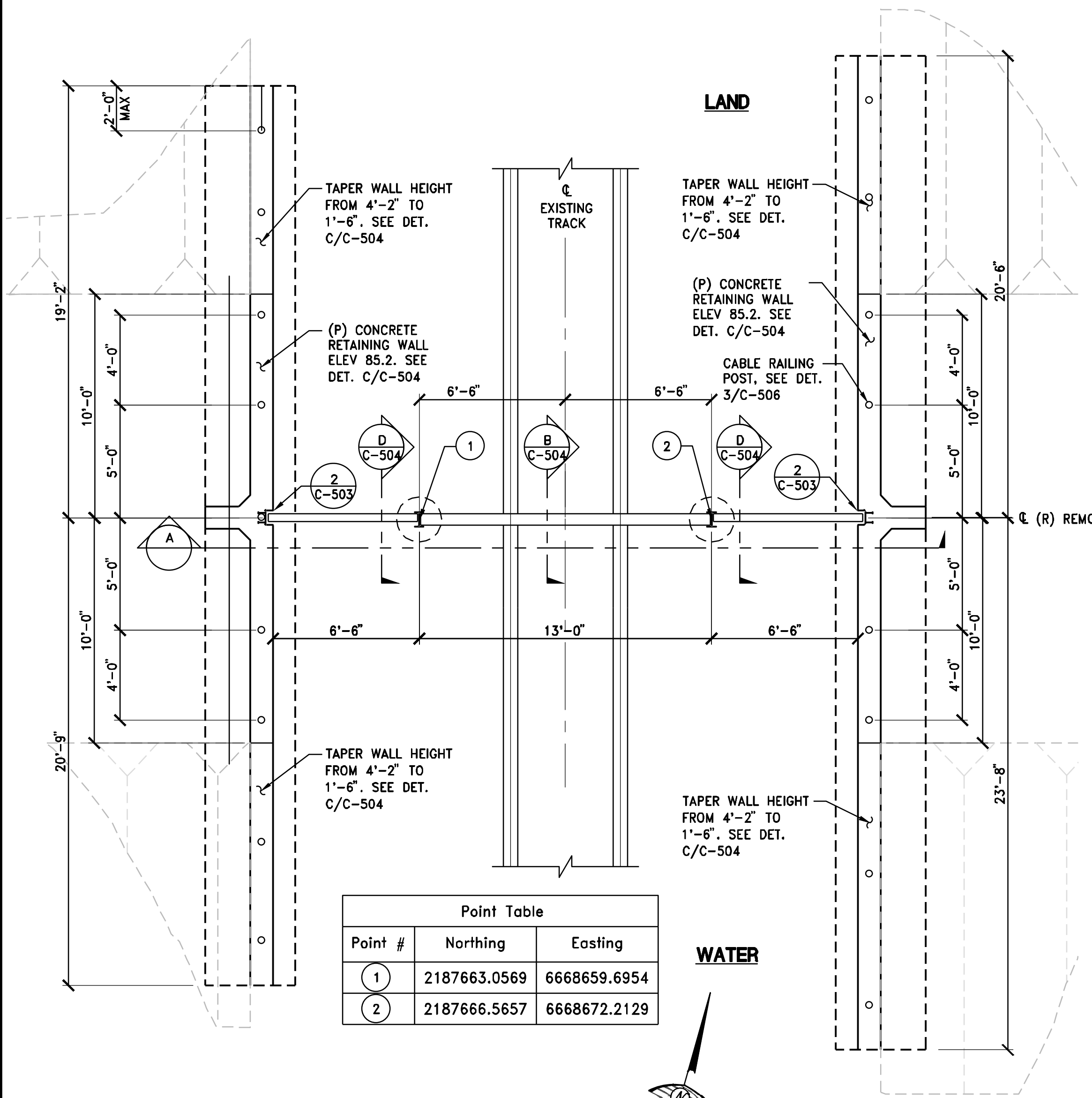
CLOSURE STRUCTURE PLAN & PROFILE @ UPRR CROSSING

VERIFY SCALES
BAR IS ONE INCH ON ORIGINAL DRAWING, ADJUST SCALES FOR REDUCED PLOTS
0 1"

DRAWING NO. C-501
SHEET 6

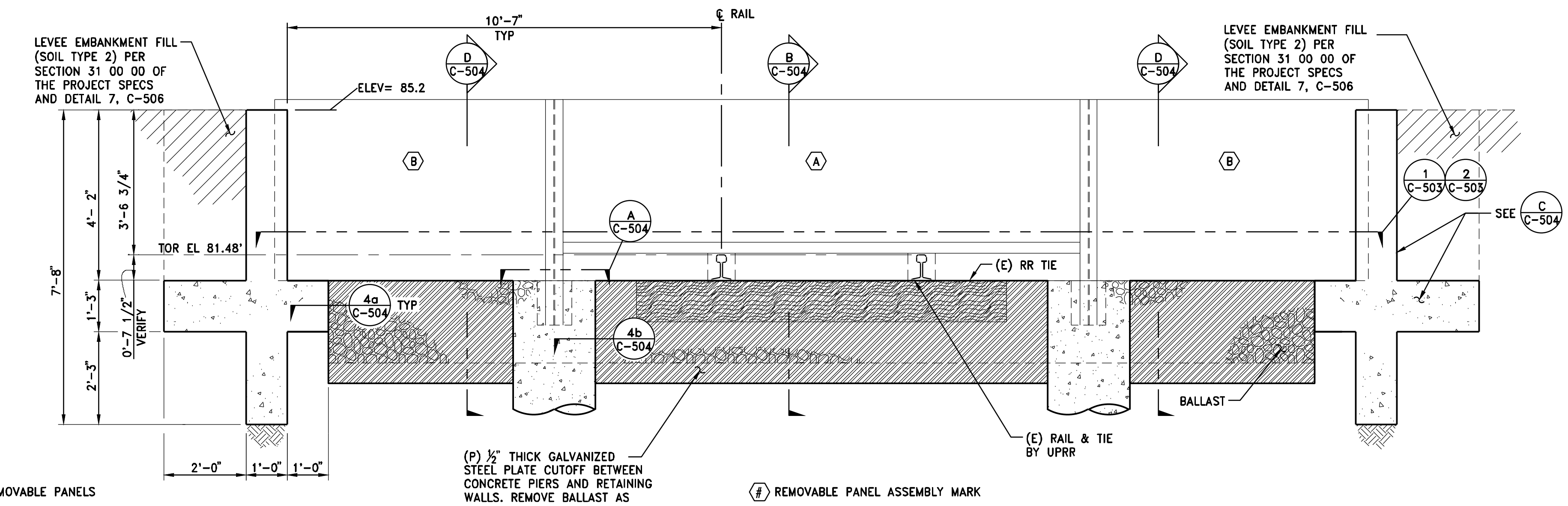
J:\Jobs\8455_HDR_Sutter_Butte_FCA\FRWL_T010\Civil\Dwg\Gap Closure Plans\Stoplog Plans\C_501_DTL-04_FRWL-GC_T010.dwg 6/16/2015 10:14 AM Evan Eyster

Attachment D - Gap Amendment Design Plans



Point Table		
Point #	Northing	Easting
1	2187663.0569	6668659.6954
2	2187666.5657	6668672.2129

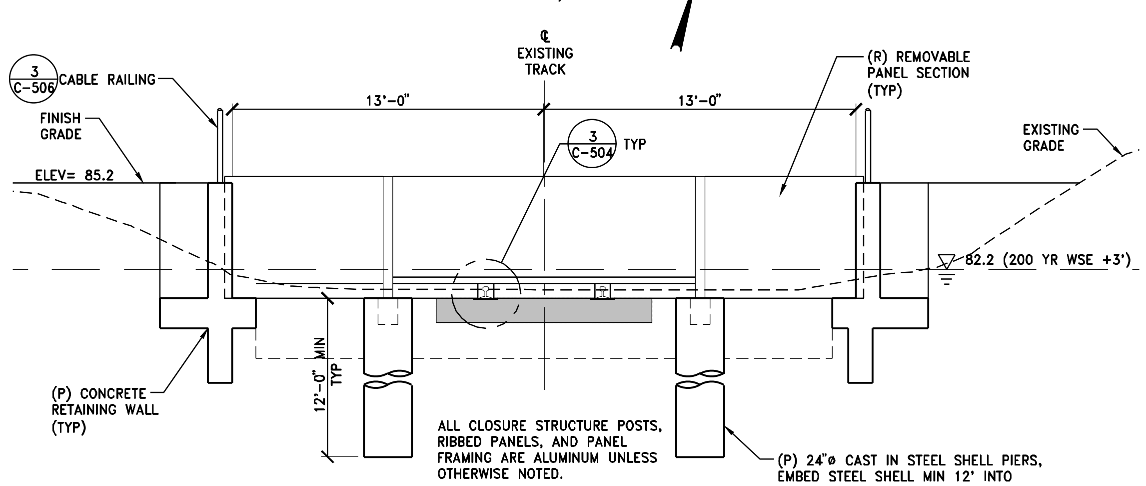
PLAN
SCALE: 1/4" = 1'-0"



SECTION A
SCALE: 1/2" = 1'-0"

LEGEND

(P) – PERMANENT COMPONENT
(R) – REMOVABLE COMPONENT
(E) – EXISTING COMPONENT
(RA) – REMOVABLE COMPONENT PART OF AN ASSEMBLY
(FB) – FIELD BOLT



ELEVATION
SCALE: 1/4" = 1'-0"

INTENT OF DRAWINGS

1. RESOLVE ANY CONFLICTS ON THE DRAWINGS WITH THE ENGINEER BEFORE PROCEEDING WITH CONSTRUCTION. DIMENSIONS TAKE PRECEDENCE OVER SCALE OF DRAWINGS. HOWEVER, ANY SIGNIFICANT CONFLICTS SHOULD BE RESOLVED AS NOTED ABOVE.
2. VERIFY ALL DIMENSIONS AND CONDITIONS ON THE JOB. RESOLVE ANY CONFLICTS BETWEEN EXISTING CONDITIONS AND INFORMATION SHOWN ON THESE DRAWINGS WITH THE ENGINEER BEFORE PROCEEDING WITH CONSTRUCTION.
3. THESE DRAWINGS REPRESENT THE FINISHED STRUCTURE AND DO NOT INDICATE THE MEANS OR METHODS OR SEQUENCES OF CONSTRUCTION. THE CONTRACTOR IS RESPONSIBLE FOR ALL TEMPORARY BRACING, SHORING AND SUPPORT NECESSARY TO ACHIEVE THE FINISHED STRUCTURE. THE CONTRACTOR IS RESPONSIBLE FOR DETERMINING AND ENFORCING ALL CONSTRUCTION LOAD LIMITS ON THE STRUCTURE.

FOUNDATION

1. UNLESS OTHERWISE INDICATED, FOUNDATION WORK SHALL BE PERFORMED IN ACCORDANCE WITH THE 2010 CBC AND ALL APPLICABLE LOCAL CODES.
2. FOUNDATION EXCAVATIONS SHALL BE EXAMINED AND CERTIFIED BY THE GEOTECHNICAL ENGINEER OR HIS REPRESENTATIVE PRIOR TO THE PLACEMENT OF ANY REINFORCING STEEL OR CONCRETE.
3. UNEXPECTED SOIL CONDITIONS: CONTRACTOR TO TEST EXCAVATED SOILS MATERIAL FOR ANY CONTAMINATIONS OR UNEXPECTED VARIATIONS AND REVIEW WITH THE SUTTER BUTTE FLOOD CONTROL AGENCY PRIOR TO HAULING OFF SITE.
4. ENGINEERED FILL: PROVIDE ENGINEERING FILL IN ACCORDANCE WITH STRUCTURAL BACKFILL REQUIREMENTS INCLUDED IN SECTION 31 00 00 OF THE PROJECT SPECS.
5. EARTH SHALL BE COMPACTED BELOW TRACKS IN ACCORDANCE WITH UPRR GUIDLINES. EARTH SHALL BE COMPACTED AROUND ALL FOOTINGS.
6. FORM FOOTINGS AS NECESSARY.
7. BOTTOM OF FOOTING SHALL BE STEPPED IF NECESSARY TO PROVIDE LEVEL BEARING.
8. FOUNDATION EXCAVATIONS SHALL BE CLEANED OF ANY LOOSENED SOILS AND STANDING WATER BEFORE PLACING STEEL OR CONCRETE.

BALLAST, TIES AND RAILS

1. CONTRACTOR TO COORDINATE WORK WHICH DISTURBS BALLAST, TIES, AND/OR RAILS WITH UPRR.
2. BALLAST, TIES AND RAILS DISTURBED BY THE PROPOSED IMPROVEMENTS SHALL BE RECONSTRUCTED IN ACCORDANCE WITH UNION PACIFIC RAILROAD PROCEDURES AND SPECIFICATIONS.

GENERAL

1. ALL MATERIALS AND WORKMANSHIP SHALL CONFORM TO THE DRAWINGS AND GENERAL NOTES AND SPECIFICATIONS.
2. ALL APPLICABLE REQUIREMENTS OF THE CALIFORNIA CONSTRUCTION AND GENERAL INDUSTRY SAFETY ORDERS, THE OCCUPATIONAL SAFETY AND HEALTH ACT AND THE CONSTRUCTION SAFETY ACT SHALL BE MET.
3. ALL ERECTION PROCEDURES SHALL CONFORM TO OSHA STANDARDS. ANY DEVIATION MUST BE APPROVED BY OSHA PRIOR TO ERECTION.
4. ALL NECESSARY PERMITS, LICENSES, APPROVALS, FEES, NOTICES, ETC, SHALL BE OBTAINED PRIOR TO BEGINNING CONSTRUCTION.
5. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE SAFETY OF THE STRUCTURE DURING THE CONSTRUCTION PERIOD. ALL ELEMENTS SHALL BE SECURELY SHORED AND BRACED AT ALL TIMES DURING CONSTRUCTION. THE CONTRACTOR SHALL RETAIN A CALIFORNIA REGISTERED CIVIL ENGINEER TO DESIGN ALL TEMPORARY SHORING, BRACING AND GUYS REQUIRED DURING CONSTRUCTION IN ACCORDANCE WITH ALL NATIONAL, STATE AND LOCAL SAFETY ORDINANCES.
6. THE CONTRACTOR SHALL BE SOLELY RESPONSIBLE FOR ALL EXCAVATION PROCEDURES INCLUDING LAGGING, SHORING AND PROTECTION OF ADJACENT PROPERTY, STRUCTURES, STREETS AND UTILITIES IN ACCORDANCE WITH ALL NATIONAL, STATE AND LOCAL SAFETY ORDINANCES.
7. THE CONTRACTOR SHALL BE RESPONSIBLE FOR CONTACTING ALL UTILITIES AGENCIES AS TO THE LOCATION OF ALL UNDERGROUND FACILITIES FOR THE PROTECTION OF AND REPAIR OF DAMAGE TO THEM. CALL "UNDERGROUND SERVICE ALERT" FORTY-EIGHT HOURS BEFORE DIGGING.
8. THE CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATING THE WORK OF ALL TRADES AND SHALL CHECK ALL DIMENSIONS. ALL DISCREPANCIES SHALL BE CALLED TO THE ATTENTION OF THE ENGINEER AND SHALL BE RESOLVED BEFORE PROCEEDING WITH THE WORK.
9. SHOP DRAWINGS REQUIRED BY THE CONTRACT DOCUMENTS SHALL BE SUBMITTED TO THE ENGINEER FOR REVIEW PRIOR TO FABRICATION. ALL SHOP DRAWINGS SHALL BE REVIEWED BY THE GENERAL CONTRACTOR BEFORE SUBMITTAL. THE ENGINEER'S REVIEW IS TO BE FOR CONFORMANCE WITH THE DESIGN CONCEPT AND GENERAL COMPLIANCE WITH THE RELEVANT CONTRACT DOCUMENTS. THE ENGINEER'S REVIEW DOES NOT RELIEVE THE CONTRACTOR OF THE SOLE RESPONSIBILITY TO REVIEW, CHECK AND COORDINATE THE SHOP DRAWINGS PRIOR TO SUBMISSION. THE CONTRACTOR REMAINS SOLELY RESPONSIBLE FOR ERRORS AND OMISSIONS ASSOCIATED WITH THE PREPARATION OF SHOP DRAWINGS AS THEY PERTAIN TO MEMBER SIZES, DETAILS, DIMENSIONS, ETC.
10. ALL DETAILS DESIGNATED AS STANDARD OR TYPICAL SHALL APPLY TO ALL APPLICABLE CONDITIONS IN ADDITION TO OTHER SPECIFICALLY REFERENCED DETAILS AND SECTIONS.
11. DRAWINGS INDICATE GENERAL AND TYPICAL DETAILS OF CONSTRUCTION. WHERE CONDITIONS ARE NOT SPECIFICALLY INDICATED BUT ARE OF SIMILAR CHARACTER TO DETAILS SHOWN, SIMILAR DETAILS OF CONSTRUCTION SHALL BE USED, SUBJECT TO REVIEW BY THE ENGINEER.
12. CONTRACTOR SHALL PROVIDE THREE EXTRA SETS OF ALL RUBBER STOPPERS, RUBBER & NEOPRENE SEALS, SEATS, GASKETS, CLAMPS, FIELD BOLTS/NUTS, REMOVABLE PLATES, ETC. AS WELL AS A SET OF ALL TOOLS NECESSARY TO INSTALL THE TEMPORARY COMPONENTS IN A WATERPROOF/DUSTPROOF CONTAINER.

TESTS AND INSPECTIONS

STRUCTURAL TESTS AND SPECIAL INSPECTIONS SHALL BE CONDUCTED AS NOTED BELOW AND SHALL CONFORM TO THE REQUIREMENTS STATED IN THE PROJECT SPECIFICATIONS.

TESTS:

- ☒ FILL COMPACTION
- ☒ STEEL
- ☒ CONCRETE
- ☒ STRUCTURAL STEEL
- ☐ MASONRY
- ☒ GROUT AND MORTAR
- ☐ EPOXY AND EXPANSION ANCHORS
- ☐ SHOTCRETE

INSPECTIONS:

- ☒ SPECIAL GRADING, EXCAVATION REINFORCING AND FILLING
- ☐ PILE/PIER INSTALLATION
- ☒ REINFORCEMENT PLACEMENT
- ☒ CONCRETE PLACEMENT
- ☒ SHOP WELDING
- ☒ FIELD WELDING
- ☒ HIGH STRENGTH BOLTING
- ☐ MASONRY PLACEMENT AND GROUTING
- ☐ SHEAR STUD INSTALLATION
- ☒ EPOXY AND EXPANSION ANCHORS
- ☐ SHOTCRETE
- ☒ ANCHOR BOLT SIZE AND PLACEMENT

DESIGN CRITERIA

1. CODES AND STANDARDS:
   ACI 318-05 ACI REQUIREMENTS FOR STRUCTURAL CONCRETE
   AISC 360-05 SPECIFICATIONS FOR STRUCTURAL STEEL BUILDINGS
   2010 CALIFORNIA BUILDING CODE (CBC) "A" CHAPTERS WHERE APPLY

METAL & HARDWARE

1. ALUMINUM CONSTRUCTION SHALL CONFORM TO THE LATEST EDITION OF THE ALUMINUM CONSTRUCTION MANUAL OF THE ALUMINUM ASSOCIATION AND THE CALIFORNIA BUILDING CODE.
2. UNLESS OTHERWISE INDICATED, STRUCTURAL ALUMINUM SHALL BE ALLOY 6061-T6 AS SPECIFIED IN ASTM B-308.
3. WHERE ALUMINUM IS IN CONTACT WITH CONCRETE OR MASONRY SURFACE CONTACT SURFACES SHALL BE COATED WITH HEAVY ALKALI-RESISTANT BITUMINOUS PAINT.
4. STEEL CASING, CUTOFF PLATE, STIFFENERS, STRUCTURAL STEEL ANGLES, ETC. SHALL BE GALVANIZED STEEL UNLESS OTHERWISE NOTED.
5. ALL HARDWARE (BOLTS, WASHERS, ETC.) SHALL BE GALVANIZED STEEL UNLESS OTHERWISE NOTED.
6. METAL AND HARDWARE FABRICATION SHALL BE IN ACCORDANCE WITH SECTION 05 50 13 OF THE PROJECT SPECIFICATIONS.

FOR BID

Attachment D - Gap Amendment Design Plans

REV.	DATE	BY	CHK.	APPR.	DESCRIPTION	REV.	DATE	BY	CHK.	APPR.	DESCRIPTION

DESIGNED BY: G. MURDOCK
DRAWN BY: J. PATCHETT
CHECKED BY: G. CALVILLO
IN CHARGE: J. KORS
DATE: 02/20/2015

PRELIMINARY

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SUBMITTED | APPROVED

SUTTER BUTTE FLOOD CONTROL AGENCY

FEATHER RIVER WEST LEVEE PROJECT
UPRR CLOSURE STRUCTURE PLANS

UPRR CLOSURE STRUCTURE DETAILS (1 OF 4)

VERIFY SCALES
BAR IS ONE INCH ON ORIGINAL DRAWING, ADJUST SCALES FOR REDUCED PLOTS
0 — 1"

DRAWING NO. C-502
SHEET 7

CONCRETE

1. ALL STRUCTURAL CONCRETE SHALL HAVE A DENSITY AFTER CURING BASED ON WEIGHT CLASSIFICATION AS SHOWN BELOW, U.O.N.:

   NORMAL WEIGHT: DENSITY = 145 PCF

2. ALL CONCRETE SHALL BE NORMAL WEIGHT UNLESS SPECIFICALLY NOTED OTHERWISE ON THE DRAWINGS.
3. ALL STRUCTURAL CONCRETE SHALL BE MADE FROM AGGREGATES BASED ON WEIGHT CLASSIFICATION AS SHOWN BELOW, U.O.N.:
   NORMAL WEIGHT: ASTM C33 WITH PROVEN SHRINKAGE CHARACTERISTICS OF LESS THAN 0.05%
   LIGHT WEIGHT: ASTM C330.
4. ALL CONCRETE SHALL CONSIST OF CLASS 3A CONCRETE PER THE SPECIFICATIONS (f'c=3,000 P.S.I. WATER/CEMENT RATIO OF 0.50)
5. ALL CEMENT SHALL CONFORM TO ASTM C150 TYPE I OR II, U.O.N.
6. CONCRETE MIX DESIGNS SHALL BE PREPARED, IN ACCORDANCE WITH SECTION 03 30 00 OF THE PROJECT SPECIFICATIONS, BY AN INDEPENDENT LABORATORY AND REVIEWED BY THE ENGINEER.
7. ADMIXTURES SHALL COMPLY WITH ASTM C494 AND BE OF A TYPE THAT INCREASES THE WORKABILITY OF THE CONCRETE, BUT SHALL NOT BE CONSIDERED TO REDUCE THE SPECIFIED MINIMUM CEMENT CONTENT. CALCIUM CHLORIDE SHALL NOT BE USED.
8. PLACEMENT OF CONCRETE SHALL BE IN CONFORMANCE WITH ACI 301.
9. GROUT: PREMANUFACTURED MIX WITH MINIMUM COMPRESSIVE STRENGTH AT THE END OF 28 DAYS OF 7000 P.S.I. WITH MINIMUM WATER CONSISTENT WITH PLACING REQUIREMENTS. GROUT SHALL BE MIXED AND PLACED IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS.

REINFORCING STEEL

1. ALL REINFORCING STEEL SHALL CONFORM TO ASTM STANDARD AS NOTED:

   TYPICAL REBAR: A615 GRADE 60
   REBAR TO BE WELDED: A706 GRADE 60

2. WELDED WIRE FABRIC SHALL CONFORM TO ASTM A185. MINIMUM LAP AT SPLICES SHALL BE 12 INCHES.
3. ALL CONCRETE SHALL BE REINFORCED UNLESS SPECIFICALLY NOTED "NOT REINFORCED" IN THE DRAWINGS. IF REINFORCING BARS ARE NOT SHOWN OR NOTED, PROVIDE SAME REINFORCEMENT AS FOR SIMILAR CONDITIONS ELSEWHERE IN THE WORK, OR AS DIRECTED BY THE ENGINEER.
4. REINFORCEMENT BARS #5 AND LARGER SHALL NOT BE SPLICED EXCEPT AS DETAILED AND LOCATED ON DRAWINGS. #4 AND SMALLER BARS WITH LENGTH NOT SHOWN SHALL BE CONTINUOUS, LAPPING IN CONCRETE 1'-6" MINIMUM. WALL HORIZONTAL REINFORCEMENT SPLICES SHALL BE STAGGERED, VERTICAL REINFORCEMENT SHALL BE SPLICED ONLY AT HORIZONTAL SUPPORTS, SUCH AS FLOOR UNLESS OTHERWISE NOTED ON DRAWINGS. ALL SPLICES SHALL BE CLASS B U.O.N.
5. ANCHOR BOLTS, DOWELS AND OTHER EMBEDDED ITEMS SHALL BE ACCURATELY SET IN PLACE AND FIRMLY SUPPORTED BEFORE CONCRETE IS PLACED.
6. REINFORCEMENT BARS SHALL BE ACCURATELY PLACED AND FIRMLY SUPPORTED USING TIES AND SUPPORT BARS IN ADDITION TO REINFORCEMENT SHOWN WHERE FIRM AND ACCURATE PLACING IS NECESSARY AS SPECIFIED IN THE ACI STANDARDS. DOWELS SHOULD BE PROVIDED TO MATCH ALL REINFORCEMENT AT CONSTRUCTION JOINTS UNLESS OTHERWISE NOTED.
7. NO REINFORCEMENT WELDING (TACK WELDING INCLUDED) SHALL BE DONE UNLESS SHOWN ON THE DRAWINGS OR APPROVED BY THE ENGINEER.
8. ALL DIMENSIONS SHOWN FOR LOCATION OF REINFORCING ARE TO THE FACE OF BARS AND DENOTE CLEAR COVERAGE UNLESS OTHERWISE NOTED.
9. MINIMUM CONCRETE COVERAGE OF REINFORCING STEEL SHALL BE AS FOLLOWS, UNLESS OTHERWISE NOTED ON PLANS:

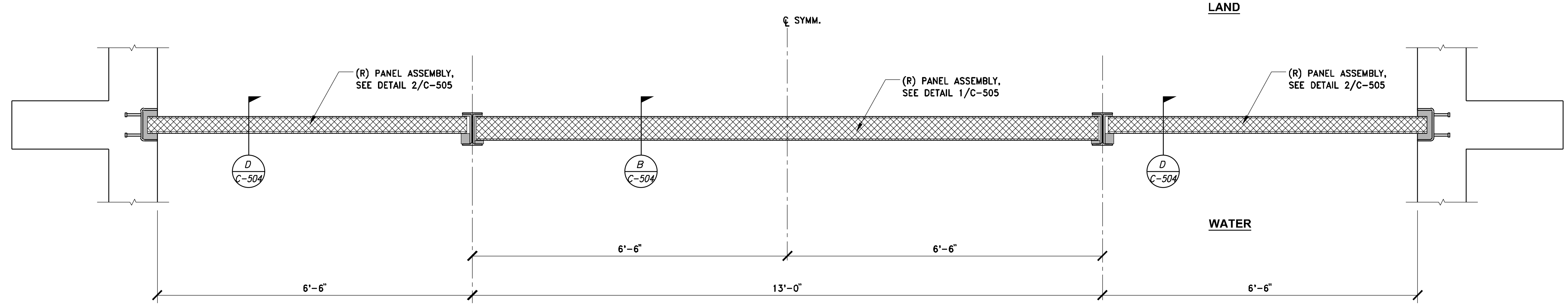
   CONCRETE CAST AGAINST EARTH 3"

   FORMED CONCRETE EXPOSED TO EARTH OR WEATHER:
   #6-#18 BARS 2"
   #5 BAR AND SMALLER 1 1/2"

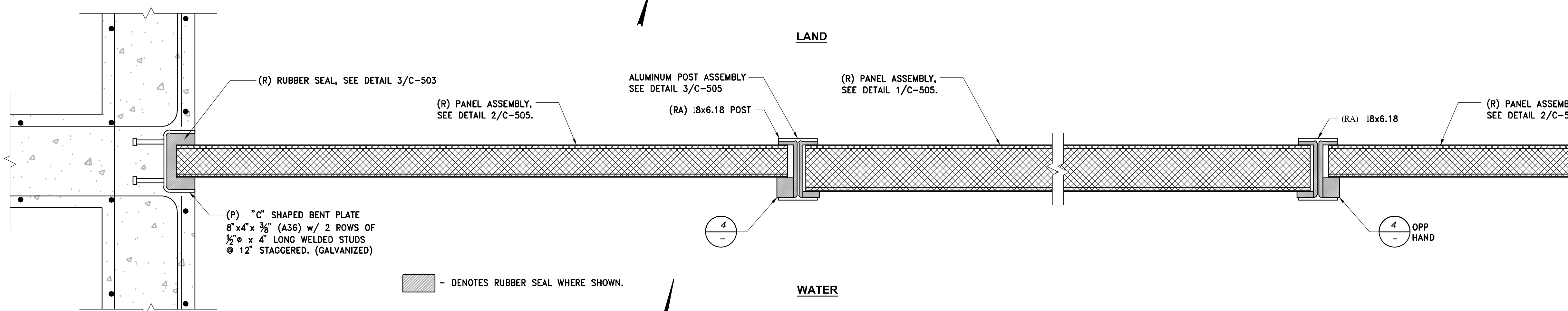
   FORMED CONCRETE NOT EXPOSED TO EARTH OR WEATHER:
   BARS IN SLABS AND WALLS 3/4"
   BARS IN BEAMS AND COLUMNS 1 1/2"

   EXTERIOR FACE OF TILT-UP WALLS EXPOSED TO WEATHER:
   #8 BARS AND SMALLER 1"

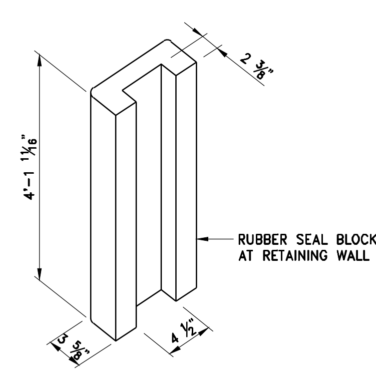
10. DRAWINGS SHOW TYPICAL REINFORCING CONDITIONS. CONTRACTOR SHALL PREPARE DETAILED PLACEMENT DRAWINGS OF ALL CONDITIONS SHOWING QUANTITY, SPACING, SIZES, CLEARANCE, LAPS, INTERSECTIONS AND COVERAGE REQUIRED BY STRUCTURAL DETAILS, APPLICABLE CODE AND TRADE STANDARDS. CONTRACTOR SHALL NOTIFY REINFORCING INSPECTOR OF ANY ADJUSTMENTS FROM TYPICAL CONDITIONS WHICH ARE PROPOSED IN PLACEMENT DRAWINGS TO FACILITATE FIELD PLACEMENT OF REINFORCING STEEL AND CONCRETE.



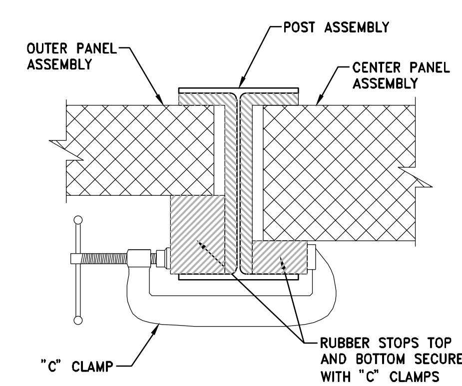
PLAN 1/–
SCALE: 3/4" = 1'-0"



DETAIL 2/–
SCALE: 1 1/2" = 1'-0"



RUBBER SEAL AT RETAINING WALL 3/–
SCALE: 1"=1'-0"



RUBBER STOPS 4/–
SCALE: N.T.S.

FOR BID

REV.	DATE	BY	CHK.	APPR.	DESCRIPTION	REV.	DATE	BY	CHK.	APPR.	DESCRIPTION

DESIGNED BY: G. MURDOCK
DRAWN BY: J. PATCHETT
CHECKED BY: G. CALVILLO
IN CHARGE: J. KORS
DATE: 06/06/2015

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SUBMITTED APPROVED

SUTTER BUTTE FLOOD CONTROL AGENCY
FEATHER RIVER WEST LEVEE PROJECT
UPRR CLOSURE STRUCTURE PLANS
UPRR CLOSURE STRUCTURE DETAILS (2 OF 4)

VERIFY SCALES
BAR IS ONE INCH ON ORIGINAL DRAWING, ADJUST SCALES FOR REDUCED PLOTS
0 1"

DRAWING NO. C-503
SHEET 8

J:\Jobs\8455_HDR_Sutter_Butte_FCA\FRWL_TO10\Civil\Dwg\Gap Closure Plans\Stoplog Plans\C_503_DTL-06_FRWL-GC_TO10.dwg 6/16/2015 10:14 AM Evon Eyster

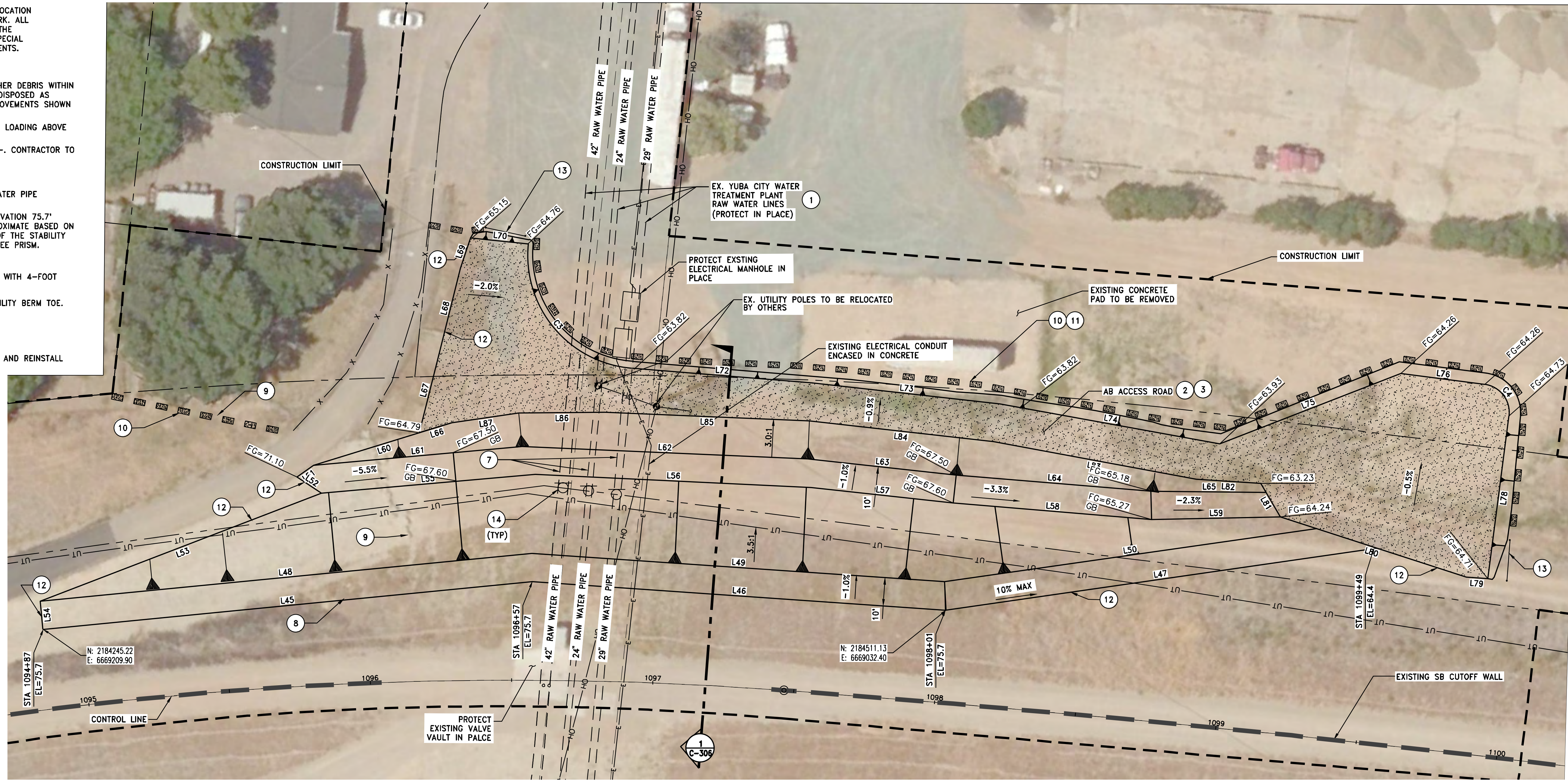
Attachment D - Gap Amendment Design Plans

YCRW Stability Berm and UPRR Gap Relief Well Plan and Sections

100% DESIGN

CONSTRUCTION NOTES:

1. THE CONTRACTOR IS RESPONSIBLE FOR POTHOLING ADJACENT UTILITIES, AND VERIFYING THE AS BUILT CONDITION, WHEN (AT MINIMUM) THEIR PRESUMED LOCATION SHOWN HEREIN IS WITHIN 10 FT OF PROPOSED WORK. ALL POTHOLING EFFORTS SHALL BE COORDINATED WITH THE APPROPRIATE UTILITY REPRESENTATIVE. REFER TO SPECIAL PROVISIONS FOR CONTINUOUS OPERATION REQUIREMENTS.
2. CONSTRUCT 15' WIDE AB ACCESS ROAD PER DETAIL 2 ON DWG C-301.
3. EXISTING REMNANT CONCRETE SLAB/PIPING AND OTHER DEBRIS WITHIN THE PROJECT FOOTPRINT SHALL BE REMOVED AND DISPOSED AS NEEDED TO FACILITATE CONSTRUCTION OF THE IMPROVEMENTS SHOWN ON THIS SHEET.
4. CONSTRUCTION TRAFFIC SHALL BE LIMITED TO H-20 LOADING ABOVE ALL EXISTING PIPES AND UTILITY LINES.
5. APPROXIMATE TOP OF PIPE ELEVATION IS 60.0' +/-. CONTRACTOR TO VERIFY.
6. CONTRACTOR TO PROTECT ALL UTILITIES IN PLACE.
7. SEE DWG C-404, C-405, AND C-406 FOR RAW WATER PIPE IMPROVEMENTS
8. STABILITY BERM BENCH LINES FOLLOW EXISTING ELEVATION 75.7' ALONG THE EXISTING LEVEE SLOPE, AND ARE APPROXIMATE BASED ON AVAILABLE TOPOGRAPHIC MAPPING. CONSTRUCTION OF THE STABILITY BERM AND ACCESS RAMP SHALL NOT CUT INTO LEVEE PRISM.
9. REMOVE EXISTING BOULDERS.
10. PLACE PRECAST 2'X2'X4' WASTE CONCRETE BLOCKS WITH 4-FOOT SPACING BETWEEN BLOCKS AS SHOWN.
11. FACE OF CONCRETE BLOCKS TO BE 20' FROM STABILITY BERM TOE.
12. MATCH EXISTING ELEVATION.
13. CONSTRUCT GATE PER DETAIL 5 ON DWG C-304.
14. REMOVE EXISTING PIPELINE MARKERS AT LEVEE TOE AND REINSTALL AT THE PROPOSED STABILITY BERM TOE.



20' 10' 0 20' 40'

HORIZ SCALE: 1" = 40'

CURVE TABLE			
CURVE	LENGTH	RADIUS	DELTA
C3	63.81	40.00	91°24'15"
C4	15.71	10.00	90°00'00"

LINE TABLE		
LINE	LENGTH	BEARING
L45	173.96	N38° 04' 32.50"W
L46	146.60	N28° 32' 39.49"W
L47	154.35	N40° 41' 26.63"W
L48	174.83	N38° 04' 27.16"W
L49	146.51	N28° 34' 12.56"W
L50	133.18	N40° 37' 09.16"W
L51	7.19	S67° 58' 18.02"E
L52	10.39	N1° 05' 12.28"E
L53	106.63	S53° 30' 31.00"E

LINE TABLE		
LINE	LENGTH	BEARING
L54	10.00	N51° 55' 27.50"E
L55	76.08	N37° 34' 14.83"W
L56	97.76	N29° 46' 27.12"W
L57	50.57	N26° 13' 21.72"W
L58	70.43	N27° 44' 52.94"W
L59	45.91	N33° 40' 52.57"W
L60	51.21	S49° 39' 16.44"E
L61	74.14	N37° 40' 11.28"W
L62	101.21	N30° 00' 30.87"W

LINE TABLE		
LINE	LENGTH	BEARING
L63	52.94	N26° 18' 11.21"W
L64	69.62	N27° 44' 58.32"W
L65	40.26	N31° 58' 06.44"W
L66	12.05	S49° 39' 16.44"E
L67	30.17	S71° 39' 49.36"W
L68	29.74	S71° 26' 22.45"W
L69	11.50	S76° 06' 24.41"W
L70	20.65	N26° 27' 50.31"W
L72	63.89	N27° 55' 14.02"W

LINE TABLE		
LINE	LENGTH	BEARING
L73	67.17	N26° 02' 41.01"W
L74	78.92	N22° 15' 23.96"W
L75	68.71	N53° 43' 14.36"W
L76	30.00	N25° 03' 30.26"W
L78	58.07	N64° 56' 29.74"E
L79	7.66	S28° 16' 57.61"E
L80	69.14	S14° 27' 56.83"E
L81	13.73	S26° 44' 52.30"W
L82	22.80	S28° 42' 22.84"E

LINE TABLE		
LINE	LENGTH	BEARING
L83	73.04	S22° 01' 55.71"E
L84	65.58	S26° 02' 31.92"E
L85	72.46	S30° 05' 35.95"E
L86	30.50	S33° 07' 04.91"E
L87	24.00	S40° 35' 17.27"E

REV.	DATE	BY	CHK.	APPR.	DESCRIPTION	REV.	DATE	BY	CHK.	APPR.	DESCRIPTION

DESIGNED BY: J. PATCHETT
DRAWN BY: J. PATCHETT
CHECKED BY: J. CHAPMAN
IN CHARGE: J. KORS
DATE: 04/01/2016

PRELIMINARY

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SUBMITTED | APPROVED

SUTTER BUTTE FLOOD CONTROL AGENCY

FEATHER RIVER WEST LEVEE PROJECT
UPRR & YCRW GAP CLOSURE
YCRW STABILITY BERM AND ACCESS ROAD PLAN

VERIFY SCALES
BAR IS ONE INCH ON ORIGINAL DRAWING, ADJUST SCALES FOR REDUCED PLOTS
0 1"

DRAWING NO. C-101 | SHEET 9

J:\Jobs\8455_HDR_Sutter_Butte_FCA\FRWL_T010\Civil\Dwg\Gap Closure Plans\Relief Well Plans\C_101_PP-01_FRWL-GC_T010.dwg 4/1/2016 1:18 PM Chuck Hilliard

Attachment D - Gap Amendment Design Plans

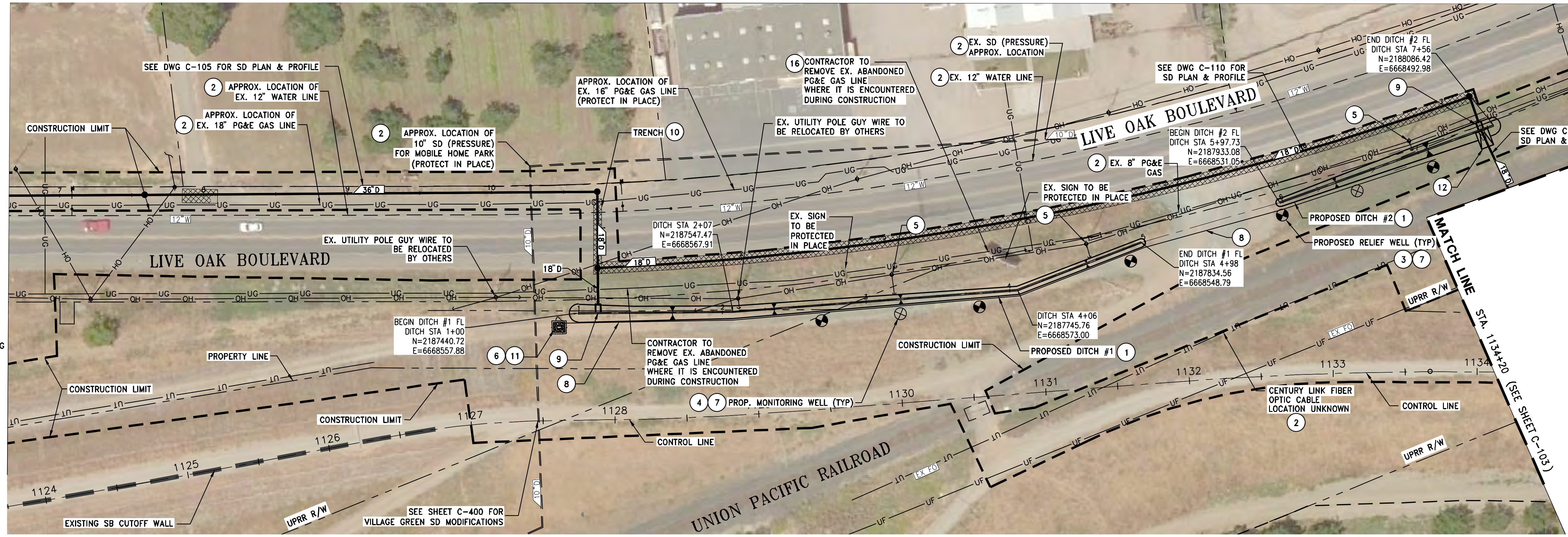
CONSTRUCTION NOTES:

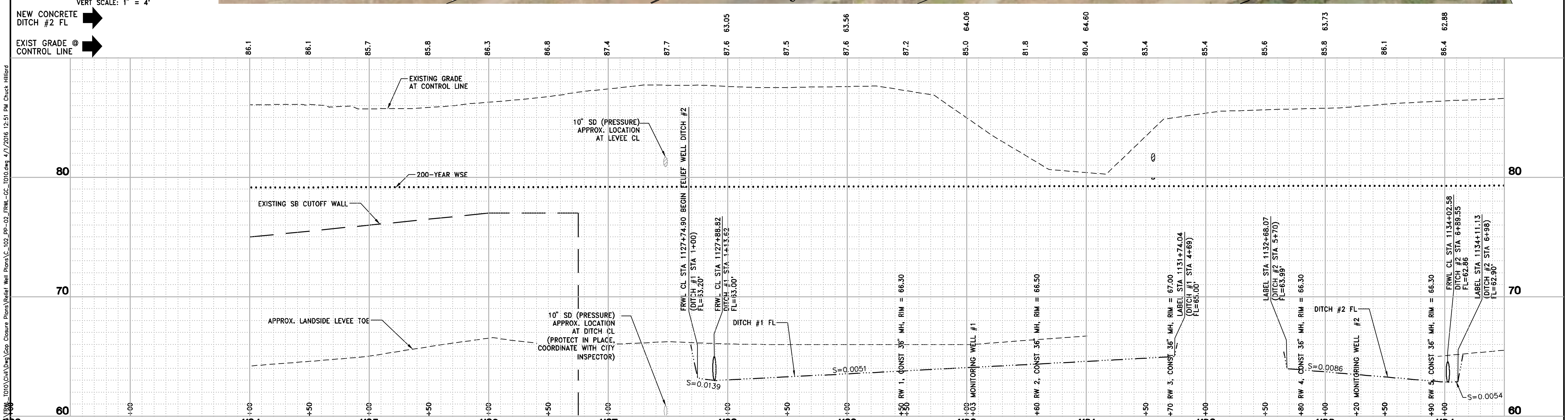
1. CONSTRUCT RELIEF WELL DITCH PER DETAIL 4 ON DWG C-302.
2. THE CONTRACTOR IS RESPONSIBLE FOR POTHOLING ADJACENT UTILITIES, AND VERIFYING THE AS BUILT CONDITION, WHEN (AT MINIMUM) THEIR PRESUMED LOCATION SHOWN HEREIN IS WITHIN 10 FT OF PROPOSED WORK. ALL POTHOLING EFFORTS SHALL BE COORDINATED WITH THE APPROPRIATE UTILITY REPRESENTATIVE.
3. CONSTRUCT RELIEF WELL PER DETAIL 4 ON DWG C-301.
4. CONSTRUCT MONITORING WELL PER DETAIL 1 ON DWG C-301.
5. CONSTRUCT 15' AB ACCESS ROAD PER DETAIL 2 ON DWG C-301.
6. INSTALL PIEZOMETER CONTROL BOX AND PEDESTAL PER DETAILS ON DWG C-305.
7. SEE WELL ELEVATION TABLE ON DWG C-302 FOR MORE INFORMATION ON RELIEF AND MONITORING WELL LOCATION/ELEVATIONS.
8. INSTALL 2" SCHEDULE 40 PVC PER DETAIL 6 ON DWG C-301.
9. CONSTRUCT INLET STRUCTURE AND TRASH RACK PER DETAIL 5 ON DWG C-302.
10. CONSTRUCT TRENCH AND REMOVE & REPLACE EXISTING AC OVER PCC PAVEMENT PER YUBA CITY STANDARD DWG TR2 (SEE DETAIL 5 ON DWG C-303).
11. INSTALL 9'L X 10'W X 7'H CHAIN LINK FENCE W/3-STRAND BARBED WIRE PER DETAIL 4 ON DWG C-305.
12. INSTALL FLARED END SECTIONS PER DETAIL 1 ON DWG C-303.

HORIZ SCALE: 1" = 40'

VERT SCALE: 1" = 4'

100% DESIGN





REV.	DATE	BY	CHK.	APPR.	DESCRIPTION	REV.	DATE	BY	CHK.	APPR.	DESCRIPTION

DESIGNED BY: J. PATCHETT
DRAWN BY: J. PATCHETT
CHECKED BY: J. CHAPMAN
IN CHARGE: J. KORS
DATE: 04/01/2016

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SUTTER BUTTE FLOOD CONTROL AGENCY

FEATHER RIVER WEST LEVEE PROJECT
UPRR & YCRW GAP CLOSURE
LEVEE PLAN & PROFILE (STA 1120+00 TO STA 1130+00)

VERIFY SCALES
BAR IS ONE INCH ON ORIGINAL DRAWING, ADJUST SCALES FOR REDUCED PLOTS

DRAWING NO. C-102 | SHEET 10

J:\Jobs\8455_HDR_Sutter_Butte_FRWL_1010\Civil\Dwg\Gap Closure Plans\Relief Well Plans\C_102_PP-02_FRWL-GC_1010.dwg 4/1/2016 12:51 PM Chuck Hilliard

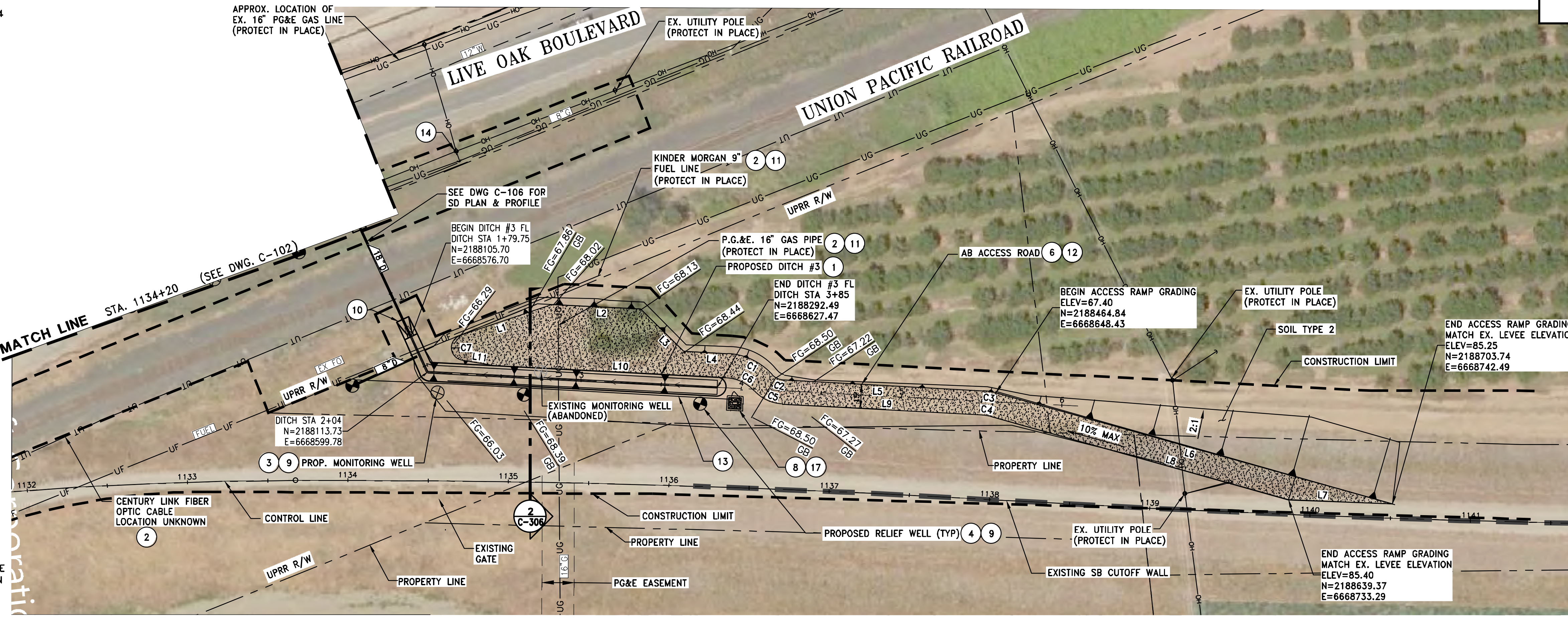
Attachment D - Gap Amendment Design Plans

ON DWG C-301.

CONSTRUCTION NOTES:

1. CONSTRUCT RELIEF WELL DITCH PER DETAIL 4 ON DWG C-302.
2. THE CONTRACTOR IS RESPONSIBLE FOR POTHOLING ADJACENT UTILITIES, AND VERIFYING THE AS BUILT CONDITION, WHEN (AT MINIMUM) THEIR PRESUMED LOCATION SHOWN HEREIN IS WITHIN 10 FT OF PROPOSED WORK. ALL POTHOLING EFFORTS SHALL BE COORDINATED WITH THE APPROPRIATE UTILITY REPRESENTATIVE.
3. CONSTRUCT MONITORING WELL PER DETAIL 1 ON DWG C-301.
4. CONSTRUCT RELIEF WELL PER DETAIL 4 ON DWG C-301.
5. NOT USED
6. CONSTRUCT 15' WIDE AB ACCESS ROAD PER DETAIL 2 ON DWG C-301.
7. NOT USED
8. INSTALL PIEZOMETER CONTROL BOX AND PEDESTAL PER DETAILS ON DWG C-305.
9. SEE WELL ELEVATION TABLE ON DWG C-302 FOR MORE INFORMATION ON RELIEF AND MONITORING WELL LOCATION/ELEVATIONS.
10. INSTALL FLARED END SECTIONS PER DETAIL 1 ON DWG C-303.
11. COORDINATE WITH UTILITY OWNER PRIOR TO MOBILIZATION.
12. REMOVE EXISTING TREES AS NECESSARY TO FACILITATE CONSTRUCTION.
13. INSTALL 2" SCHEDULE 40 PVC PER DETAIL 6 ON DWG C-301.
14. EXISTING UTILITY POLE, PROTECT IN PLACE.
15. CONSTRUCT INLET AND TRASH RACK PER DETAIL 5 ON DWG. C-302
16. CONTRACTOR TO CONTACT PG&E AND COORDINATE MARKING, LOCATING, AND POTHOLING OF EXISTING 8" GAS LINE PRIOR TO DOING ANY WORK.
17. INSTALL 9'L X 10'W X 7'H CHAIN LINK FENCE W/3-STRAND BARBED WIRE PER DETAIL 4 ON DWG C-305.

100% DESIGN



ACCESS ROAD LINE TABLE		
LINE	LENGTH	BEARING
L1	60.17	N12° 55' 50.64"W
L2	55.61	N8° 47' 32.87"E
L3	37.57	N50° 28' 59.07"E
L4	27.69	N8° 46' 21.21"E
L5	125.00	N8° 56' 04.14"E
L6	256.88	N21° 28' 18.81"E
L7	65.03	S8° 08' 10.90"W
L8	193.20	S21° 28' 23.20"W
L9	125.00	S8° 56' 04.14"W
L10	144.39	S8° 46' 21.21"W
L11	20.96	S15° 18' 54.34"W

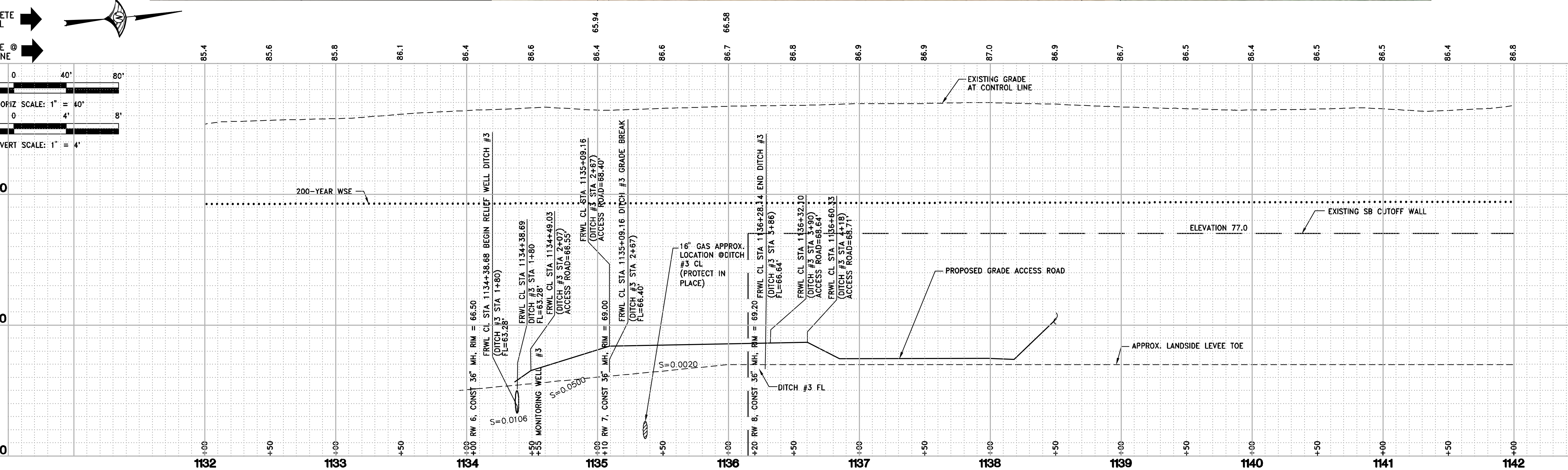
ACCESS ROAD CURVE TABLE			
CURVE	LENGTH	RADIUS	DELTA
C1	31.42	40.00	45°00'11"
C2	7.72	10.00	44°12'23"
C3	7.76	40.90	10°52'09"
C4	4.85	19.58	14°12'30"
C5	19.50	24.81	45°01'06"
C6	19.64	24.81	45°21'27"
C7	21.19	8.00	151°45'15"

NEW CONCRETE DITCH #3 FL

EXIST GRADE @ CONTROL LINE

HORIZ SCALE: 1" = 40'

VERT SCALE: 1" = 4'



DESIGNED BY:	J. PATCHETT
DRAWN BY:	J. PATCHETT
CHECKED BY:	J. CHAPMAN
IN CHARGE:	J. KORS
DATE:	04/01/2016

REV.	DATE	BY	CHK.	APPR.	DESCRIPTION	REV.	DATE	BY	CHK.	APPR.	DESCRIPTION

PRELIMINARY

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SUBMITTED APPROVED

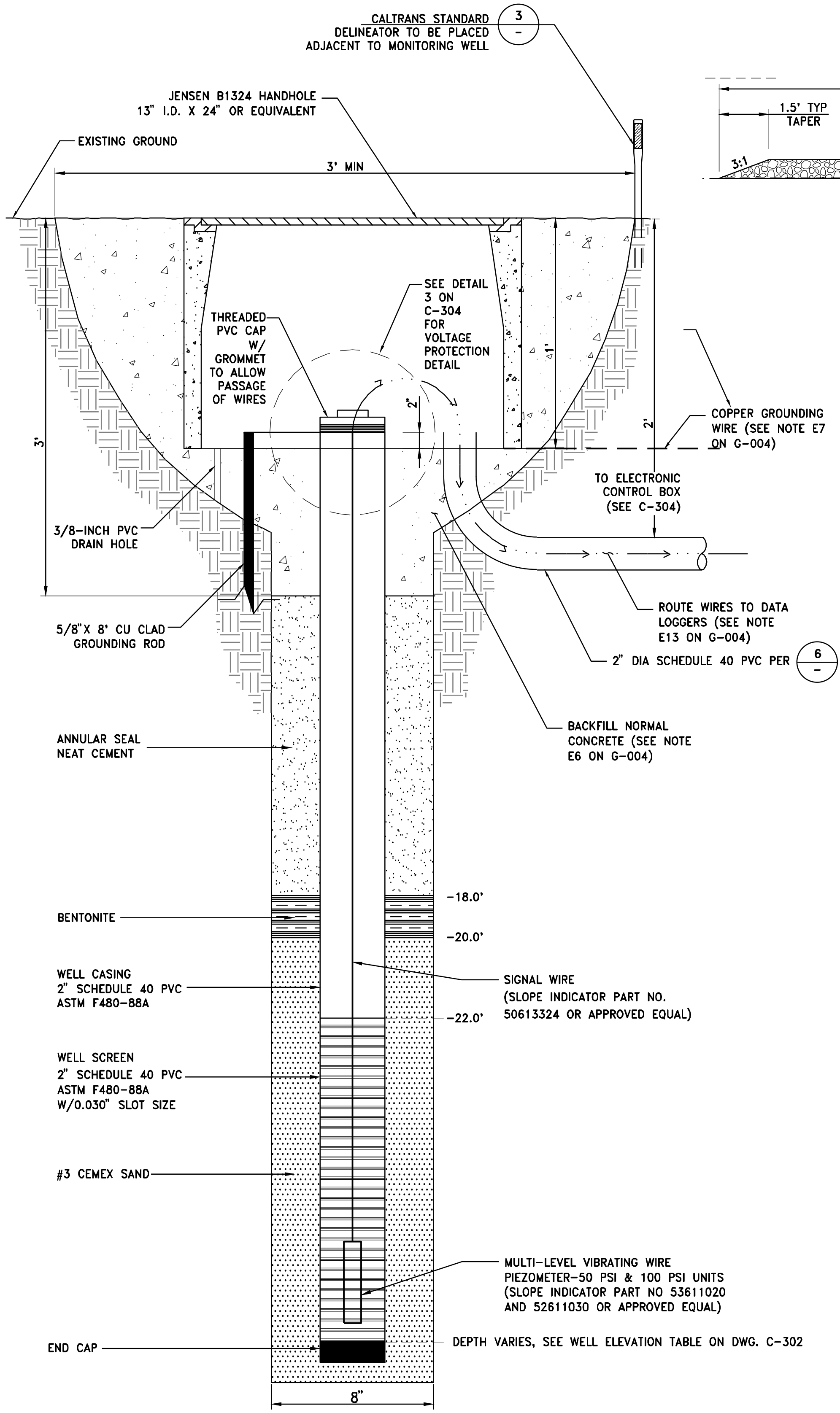
SUTTER BUTTE FLOOD CONTROL AGENCY

FEATHER RIVER WEST LEVEE PROJECT
UPRR & YCRW GAP CLOSURE
LEVEE PLAN & PROFILE (STA 1130+00 TO STA 1140+00)

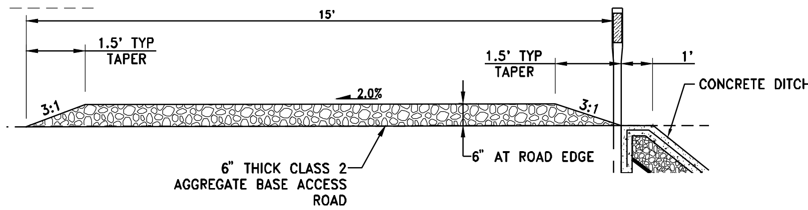
VERIFY SCALES
BAR IS ONE INCH ON ORIGINAL DRAWING, ADJUST SCALES FOR REDUCED PLOTS

DRAWING NO.	SHEET
C-103	11

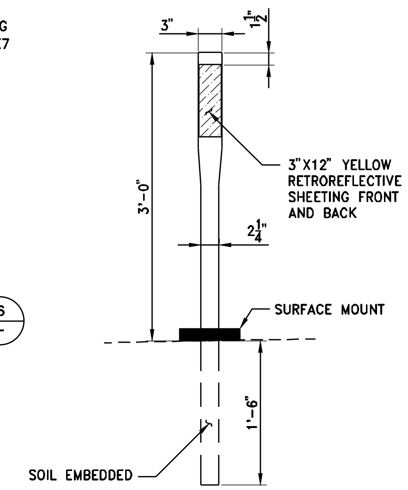
Attachment D - Gap Amendment Design Plans



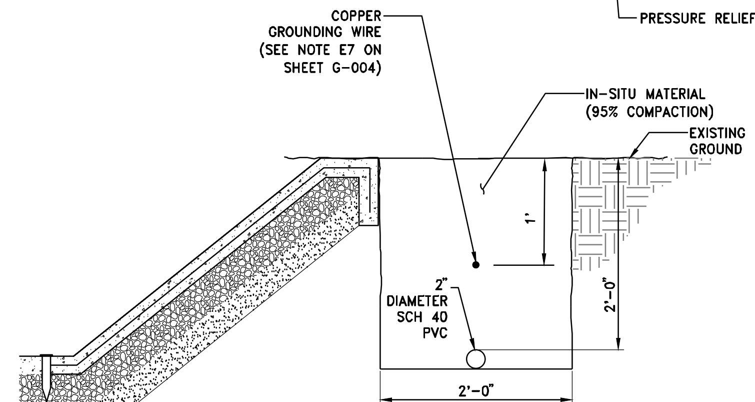
MONITORING WELL 1
SCALE: NTS



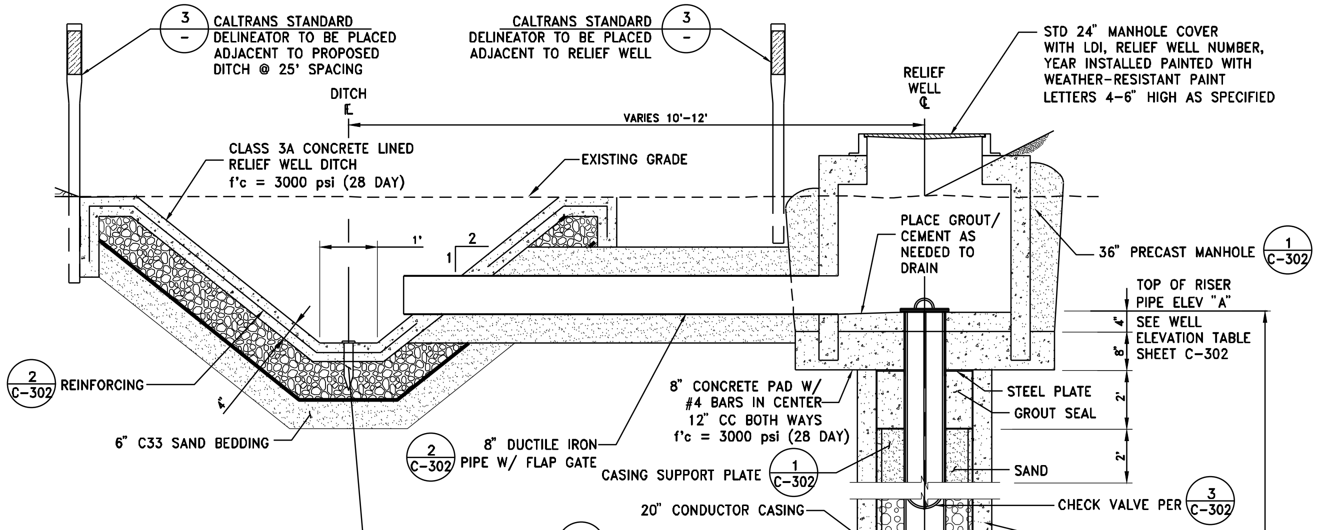
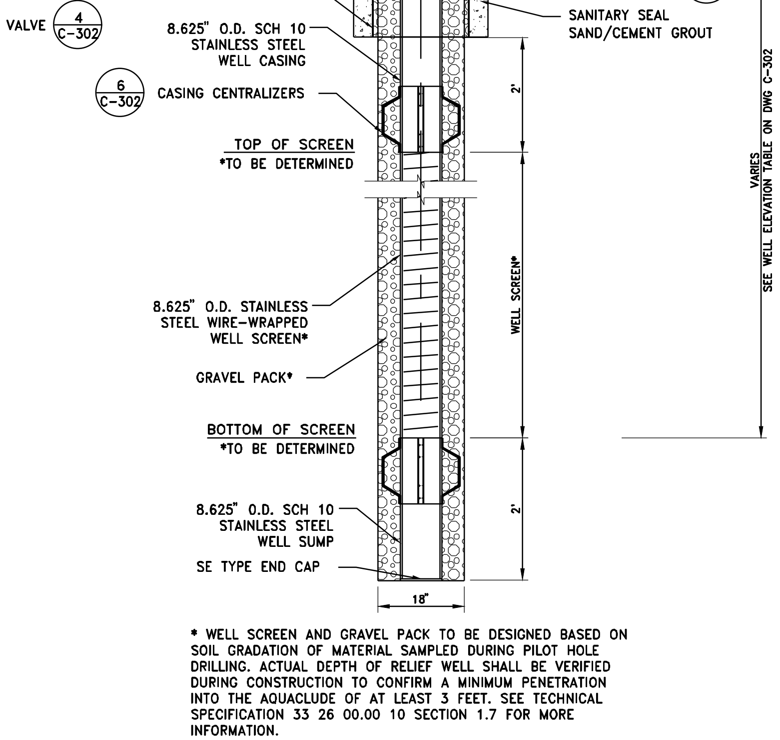
15' AB ACCESS ROAD DETAIL 2
SCALE: NTS



DETAIL 3
SCALE: NTS



TRENCH DETAIL 6
SCALE: NTS

* WELL SCREEN AND GRAVEL PACK TO BE DESIGNED BASED ON SOIL GRADATION OF MATERIAL SAMPLED DURING PILOT HOLE DRILLING. ACTUAL DEPTH OF RELIEF WELL SHALL BE VERIFIED DURING CONSTRUCTION TO CONFIRM A MINIMUM PENETRATION INTO THE AQUACLUDE OF AT LEAST 3 FEET. SEE TECHNICAL SPECIFICATION 33 26 00.00 10 SECTION 1.7 FOR MORE INFORMATION.

TYPICAL RELIEF WELL WITH CONCRETE DITCH 4
SCALE: NTS

100% DESIGN

REV.	DATE	BY	CHK.	APPR.	DESCRIPTION	REV.	DATE	BY	CHK.	APPR.	DESCRIPTION

DESIGNED BY: J. PATCHETT
DRAWN BY: J. PATCHETT
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DATE: 04/01/2016

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SUTTER BUTTE FLOOD CONTROL AGENCY

FEATHER RIVER WEST LEVEE PROJECT
UPRR & YCRW GAP CLOSURE
TYPICAL DETAILS (1 OF 4)

VERIFY SCALES
BAR IS ONE INCH ON ORIGINAL DRAWING, ADJUST SCALES FOR REDUCED PLOTS
0 1"

DRAWING NO. C-301
SHEET 16

Attachment D - Gap Amendment Design Plans

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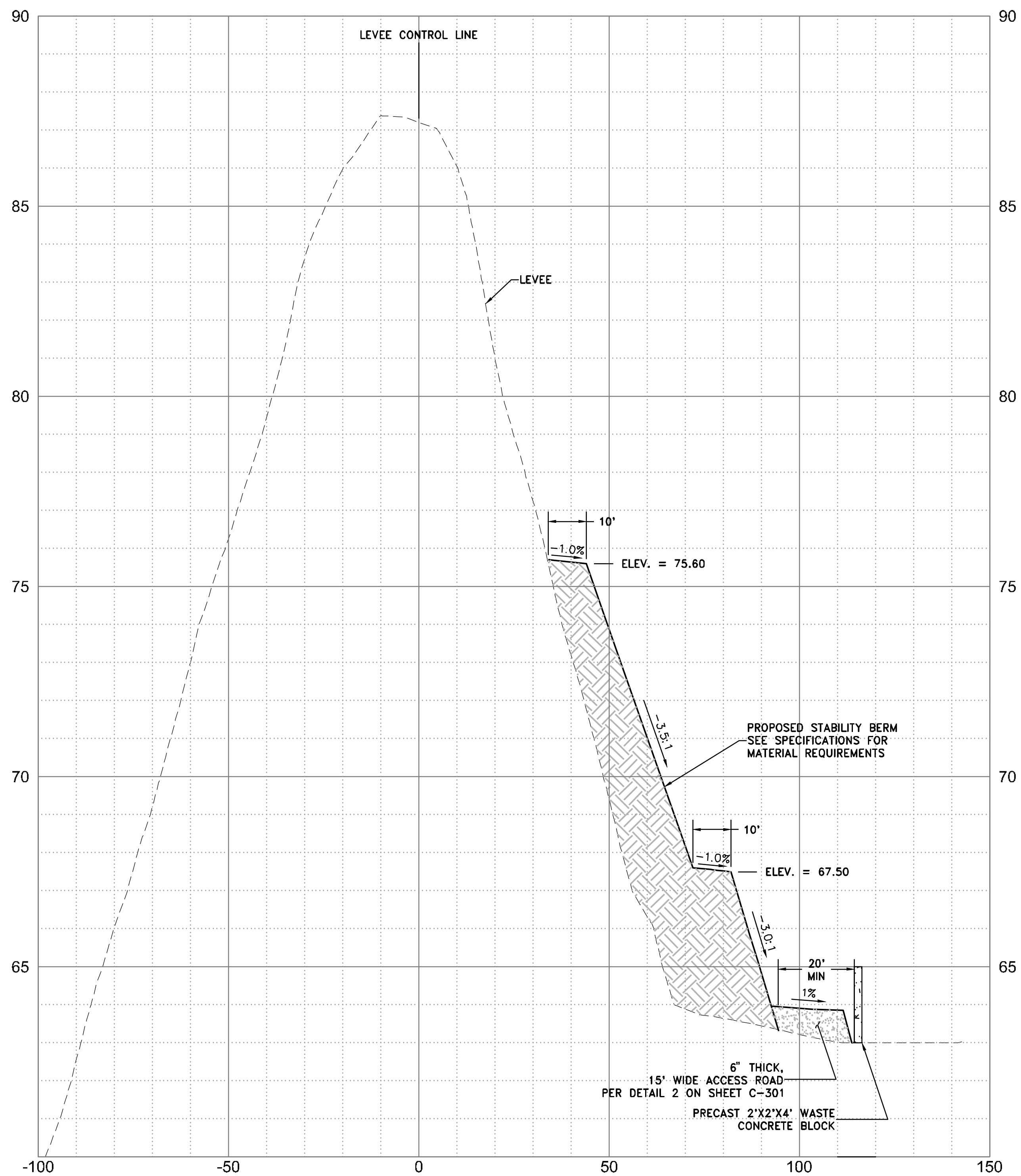
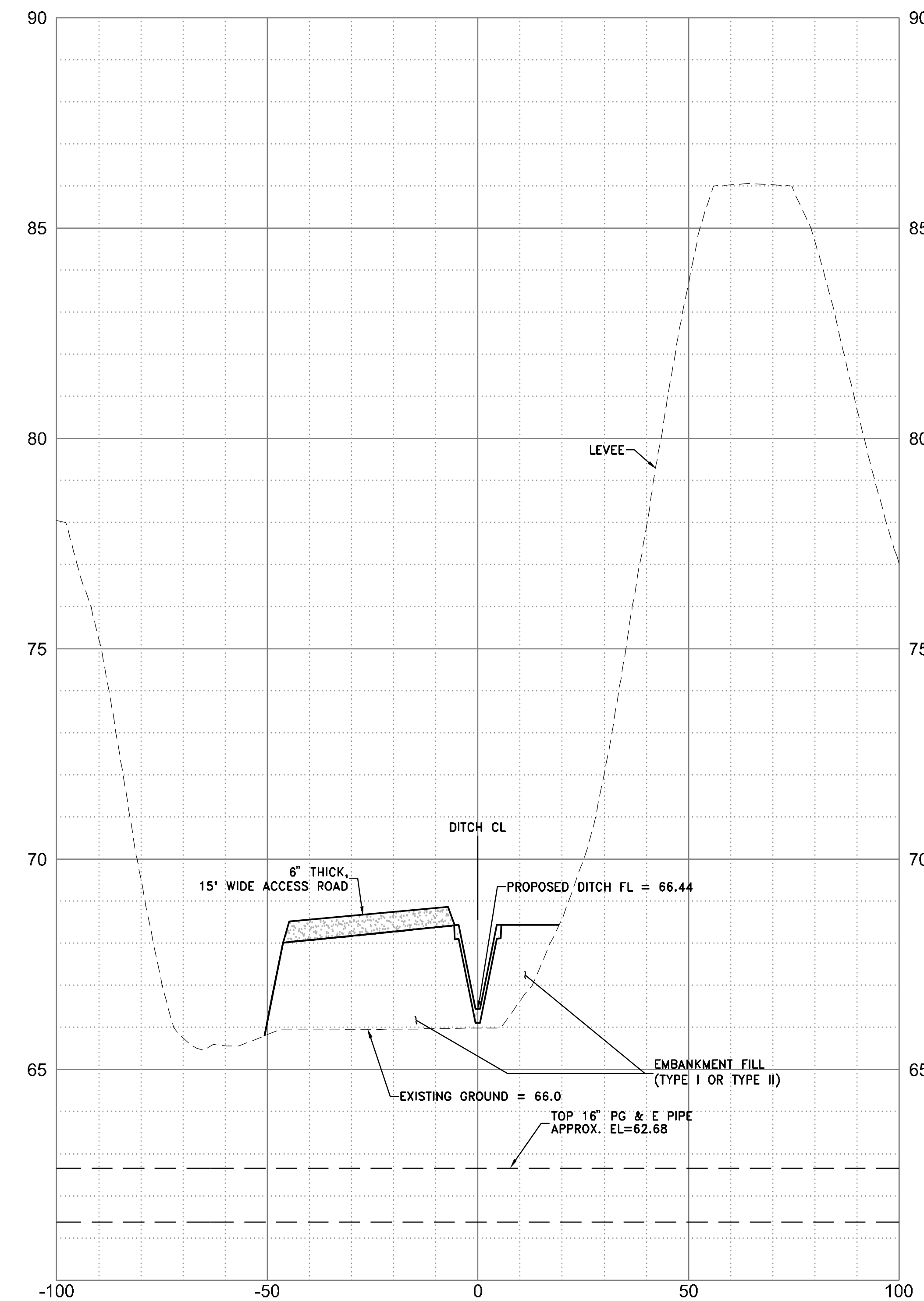


1 C-306 **SEEPAGE BERM CROSS SECTION**

HORIZ. SCALE: 1"=20'
VERT. SCALE: 1"=2'



2 C-306 **DITCH #3 CROSS SECTION AT EX. GAS PIPE**

HORIZ. SCALE: 1"=20'
VERT. SCALE: 1"=2'

100% DESIGN

REV.	DATE	BY	CHK.	APPR.	DESCRIPTION	REV.	DATE	BY	CHK.	APPR.	DESCRIPTION

DESIGNED BY: J. PATCHETT
DRAWN BY: J. PATCHETT
CHECKED BY: J. CHAPMAN
IN CHARGE: J. KORS
DATE: 04/01/2016

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APPROVED

SUTTER BUTTE FLOOD CONTROL AGENCY

FEATHER RIVER WEST LEVEE PROJECT
UPRR & YCRW GAP CLOSURE
CROSS SECTION DETAILS

VERIFY SCALES
BAR IS ONE INCH ON ORIGINAL DRAWING, ADJUST SCALES FOR REDUCED PLOTS
0 1"

DRAWING NO. C-306
SHEET 21

J:\Jobs\8455_HDR_Sutter_Butte_FCA\FRWL_T010\Civil\Dwg\Gap Closure Plans\Relief Well Plans\C_306_DTL_XSECT_FRWL-GC_T010.dwg 4/1/2016 12:59 PM Chuck Hilliard

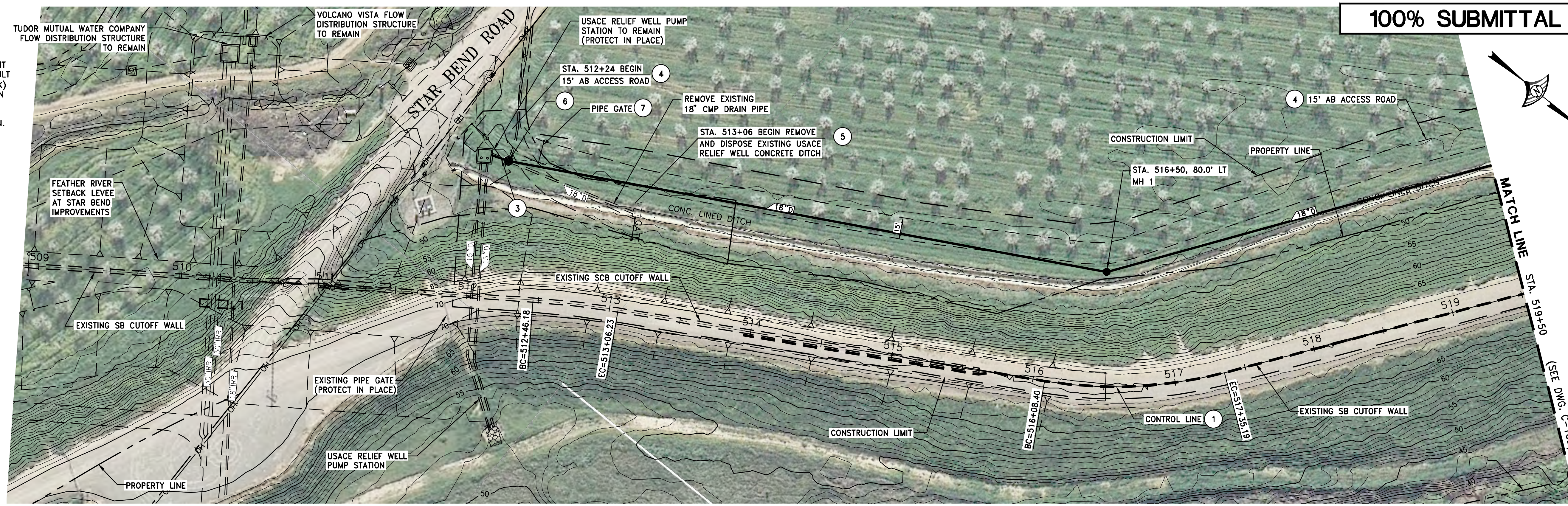
Attachment D - Gap Amendment Design Plans

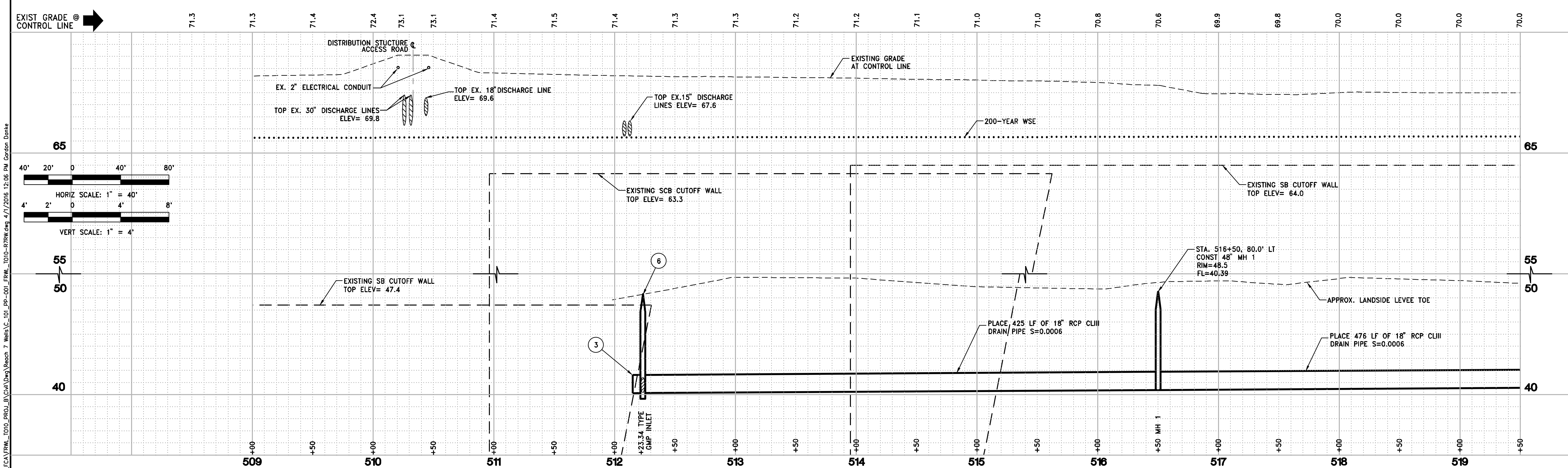
Reach 7 Relief Well Plan and Sections

CONSTRUCTION NOTES:

1. SEE DWG G-006 FOR CONTROL LINE CURVE AND TANGENT DATA.
2. CONTRACTOR SHALL PROVIDE HIGH VISIBILITY CONSTRUCTION FENCING AT THE CONSTRUCTION LIMIT LINE. SUCH FENCING SHALL BE OMITTED WHERE SILT FENCING OR CALTRANS TEMPORARY RAILING (TYPE K) IS REQUIRED BY THE PROJECT SWPPP OR IS SHOWN ON THE PLANS. FENCING MAY BE OMITTED WHERE THE CONSTRUCTION LIMIT COINCIDES WITH EXISTING FENCING OR WHERE LOCATED AT THE LEVEE CROWN.
3. REMOVE AND DISPOSE OF EXISTING 18" CMP PIPE. CONSTRUCT 10 LF 18" RCP CLIII S=0.0020 FL @ SUMP STRUCTURE = 40.12 FL @ GMP INLET = 40.14
4. CONSTRUCT 15' ACCESS ROAD PER DETAIL ON DWG C-302.
5. REMOVE AND DISPOSE EXISTING CONCRETE LINED DITCH. FILL WITH RANDOM FILL TO MATCH ADJACENT GRADES.
6. REMOVE AND REPLACE EXISTING TYPE GMP INLET PER CALTRANS STANDARD PLAN D75A. GRATE ELEVATION TO MATCH EXISTING. FL=40.14
7. CONSTRUCT PIPE GATE PER DETAIL ON DWG C-305.

100% SUBMITTAL





DESIGNED BY:	P. BLUM
DRAWN BY:	E. EYSTER
CHECKED BY:	J. CHAPMAN
IN CHARGE:	J. KORS
DATE:	04/01/2016

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SUTTER BUTTE FLOOD CONTROL AGENCY

VOL 4: FRWL REACH 7 RELIEF WELLS

PLAN & PROFILE

STA 513+95 TO 519+50

VERIFY SCALES
BAR IS ONE INCH ON ORIGINAL DRAWING, ADJUST SCALES FOR REDUCED PLOTS
0 1"

DRAWING NO.	SHEET
C-101	10

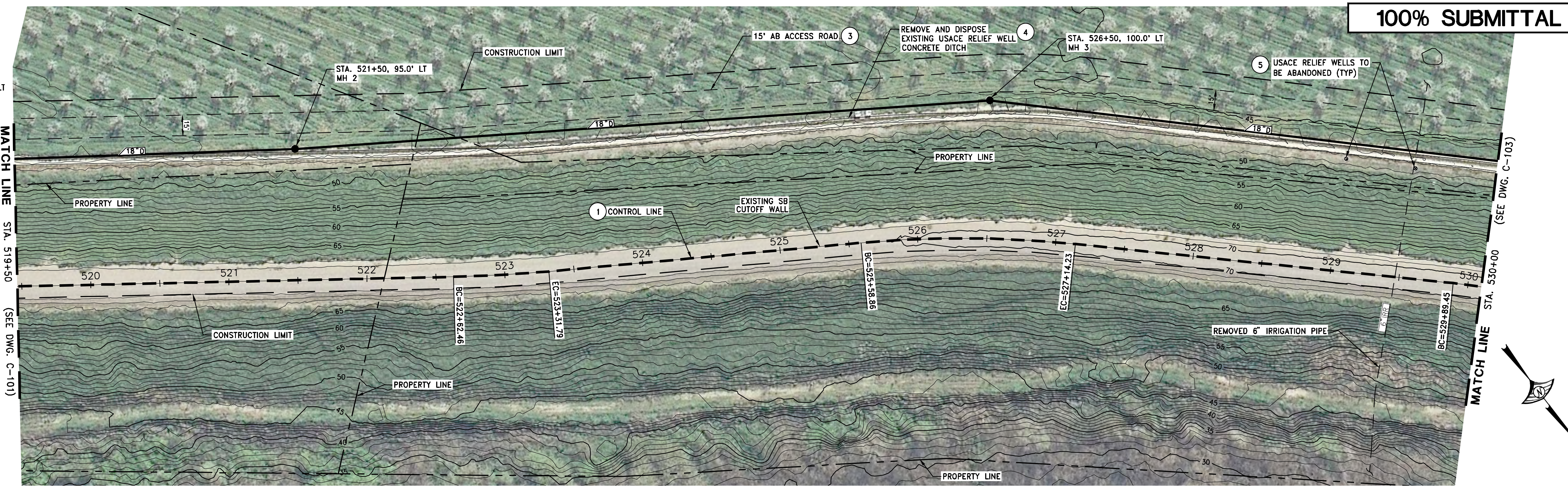
J:\Jobs\8455_HDR_Sutter_Butte_FCA\FRWL_1010_PROJ_8\Civil\Dwg\Reach 7 Wells\C_101_PP-001_FRWL_1010-R7RW.dwg 4/1/2016 12:06 PM Gordon Donke

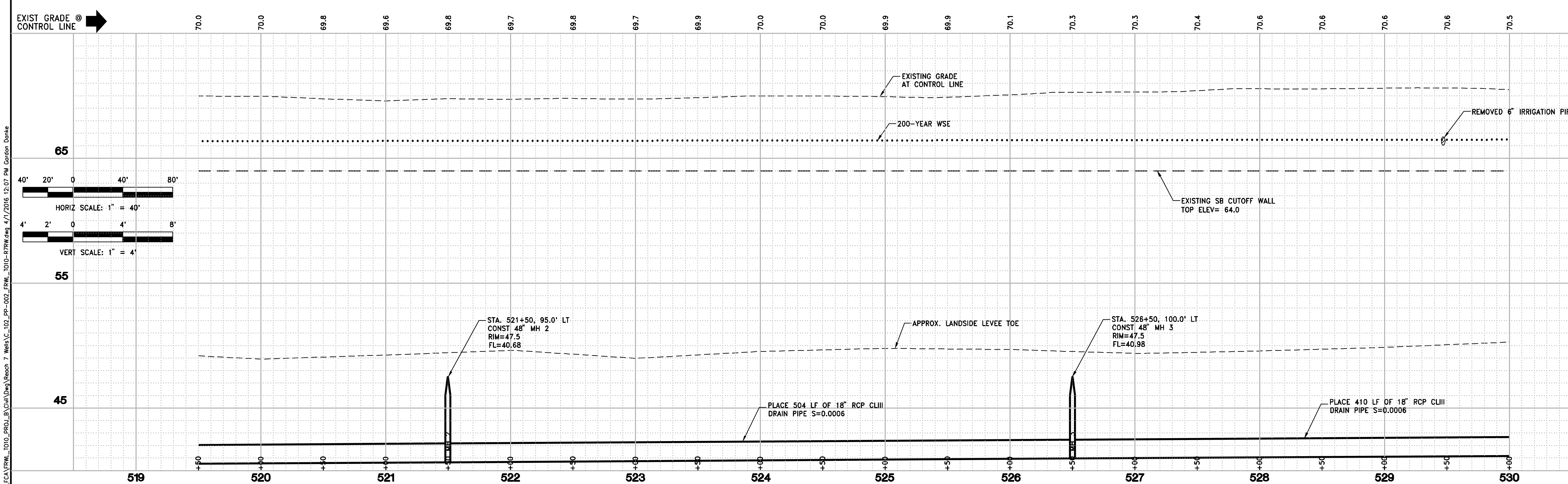
Attachment D - Gap Amendment Design Plans

100% SUBMITTAL

CONSTRUCTION NOTES:

1. SEE DWG G-006 FOR CONTROL LINE CURVE AND TANGENT DATA.
2. CONTRACTOR SHALL PROVIDE HIGH VISIBILITY CONSTRUCTION FENCING AT THE CONSTRUCTION LIMIT LINE. SUCH FENCING SHALL BE OMITTED WHERE SILT FENCING OR CALTRANS TEMPORARY RAILING (TYPE K) IS REQUIRED BY THE PROJECT SWPPP OR IS SHOWN ON THE PLANS. FENCING MAY BE OMITTED WHERE THE CONSTRUCTION LIMIT COINCIDES WITH EXISTING FENCING OR WHERE LOCATED AT THE LEVEE CROWN.
3. CONSTRUCT 15' ACCESS ROAD PER DETAIL ON DWG C-302.
4. REMOVE AND DISPOSE OF EXISTING CONCRETE LINED DITCH. FILL WITH RANDOM FILL TO MATCH ADJACENT GRADES.
5. REMOVE AND DISPOSE OF EXISTING RELIEF WELL FACILITIES. RELIEF WELL SHALL BE ABANDONED IN ACCORDANCE WITH THE LOCAL COUNTY REQUIREMENTS.





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DATE: 04/01/2016

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SUBMITTED | APPROVED

SUTTER BUTTE FLOOD CONTROL AGENCY

VOL 4: FRWL REACH 7 RELIEF WELLS

PLAN & PROFILE

STA 519+50 TO 530+00

VERIFY SCALES
BAR IS ONE INCH ON ORIGINAL DRAWING, ADJUST SCALES FOR REDUCED PLOTS

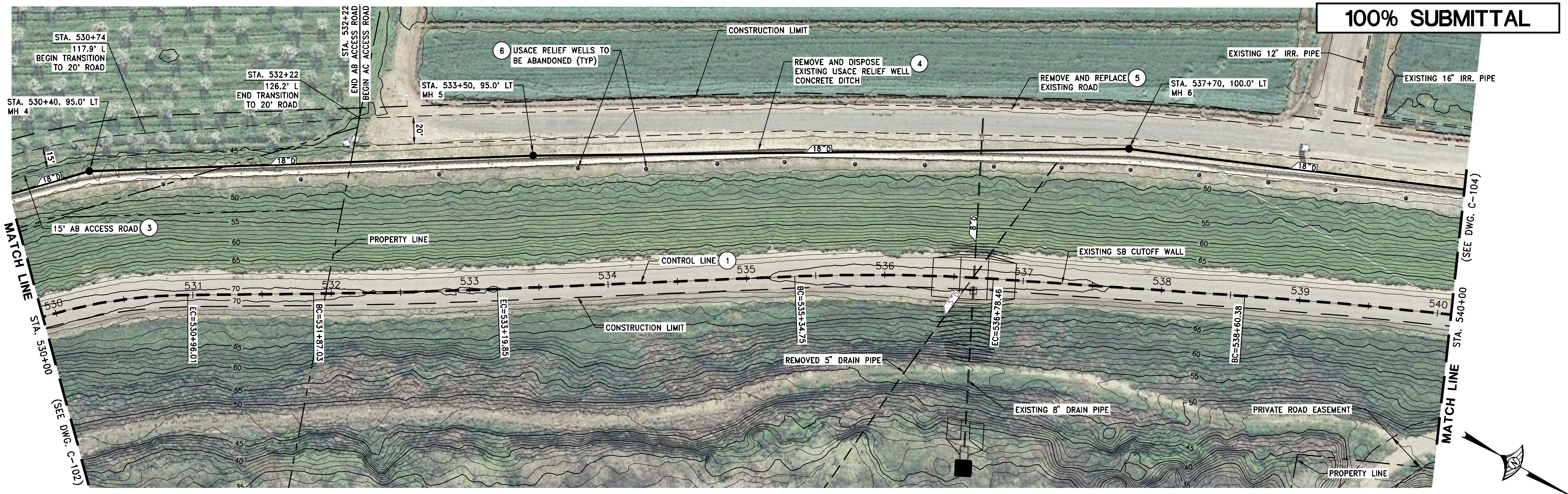
DRAWING NO. C-102 | SHEET 11

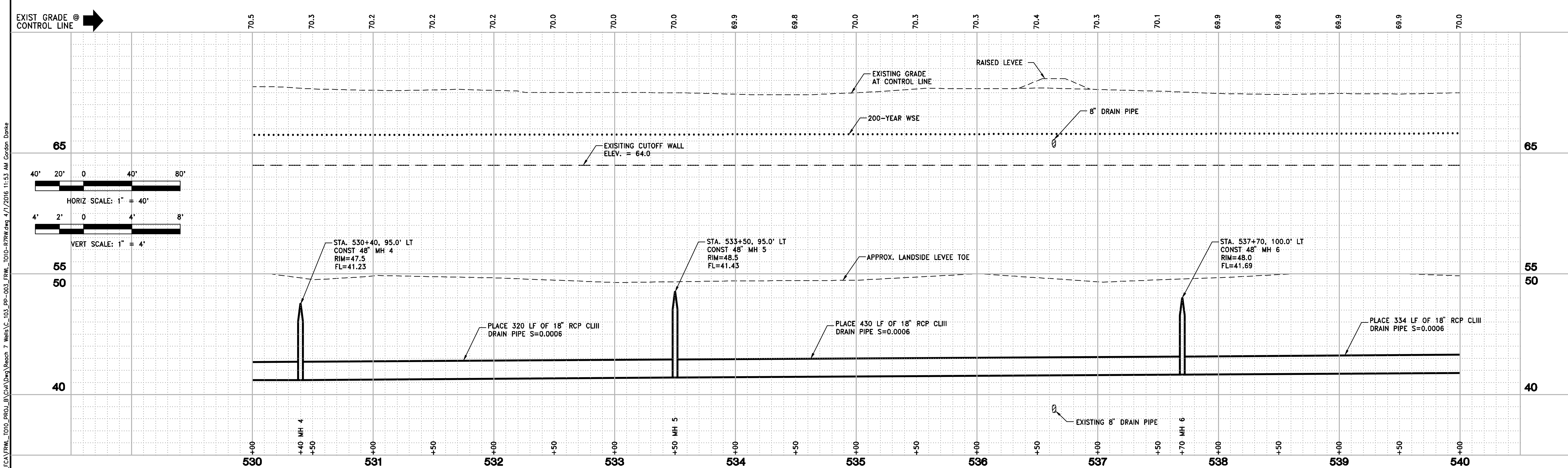
Attachment D - Gap Amendment Design Plans

CONSTRUCTION NOTES:

1. SEE DWG G-006 FOR CONTROL LINE CURVE AND TANGENT DATA.
2. CONTRACTOR SHALL PROVIDE HIGH VISIBILITY CONSTRUCTION FENCING AT THE CONSTRUCTION LIMIT LINE. SUCH FENCING SHALL BE OMITTED WHERE SILT FENCING OR CALTRANS TEMPORARY RAILING (TYPE K) IS REQUIRED BY THE PROJECT SWPPP OR IS SHOWN ON THE PLANS. FENCING MAY BE OMITTED WHERE THE CONSTRUCTION LIMIT COINCIDES WITH EXISTING FENCING OR WHERE LOCATED AT THE LEVEE CROWN.
3. CONSTRUCT 15' ACCESS ROAD PER DETAIL ON DWG C-302.
4. REMOVE AND DISPOSE OF EXISTING CONCRETE LINED DITCH. FILL WITH RANDOM FILL TO MATCH ADJACENT GRADES.
5. REMOVE AND REPLACE EXISTING ROAD PER DETAIL ON DWG C-302.
6. REMOVE AND DISPOSE OF EXISTING RELIEF WELL FACILITIES. RELIEF WELL SHALL BE ABANDONED IN ACCORDANCE WITH THE LOCAL COUNTY REQUIREMENTS.

100% SUBMITTAL





Attachment D - Gap Amendment Design Plans

REV.	DATE	BY	CHK.	APPR.	DESCRIPTION	REV.	DATE	BY	CHK.	APPR.	DESCRIPTION

DESIGNED BY: P. BLUM
DRAWN BY: E. EYSTER
CHECKED BY: J. CHAPMAN
IN CHARGE: J. KORS
DATE: 04/01/2016

PRELIMINARY

WOOD RODGERS
DEVELOPING • INNOVATIVE • DESIGN • SOLUTIONS
3301 C STREET, BLDG. 100-B, SACRAMENTO, CA 95816
PHONE: (916) 341-7760 FAX: (916) 341-7767

SUBMITTED | APPROVED

SUTTER BUTTE FLOOD CONTROL AGENCY

VOL 4: FRWL REACH 7 RELIEF WELLS

PLAN & PROFILE

STA 530+00 TO 540+00

VERIFY SCALES
BAR IS ONE INCH ON ORIGINAL DRAWING, ADJUST SCALES FOR REDUCED PLOTS
0 1"

DRAWING NO. C-103
SHEET 12

J:\Jobs\8455_HDR_Sutter_Butte_FCA\FRWL_T010_PROJ_B\Civil\Dwg\Reach 7 Wells\C_103_PP-003_FRWL_T010-R7RW.dwg 4/1/2016 11:53 AM Gordon Danke

100% SUBMITTAL

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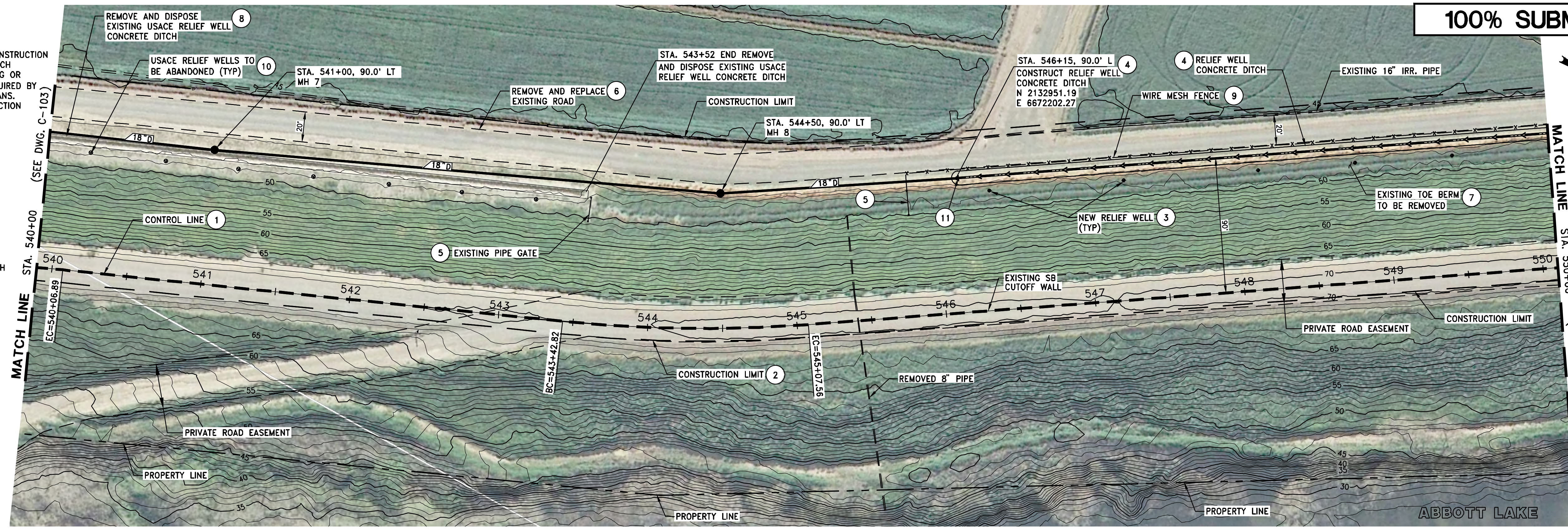
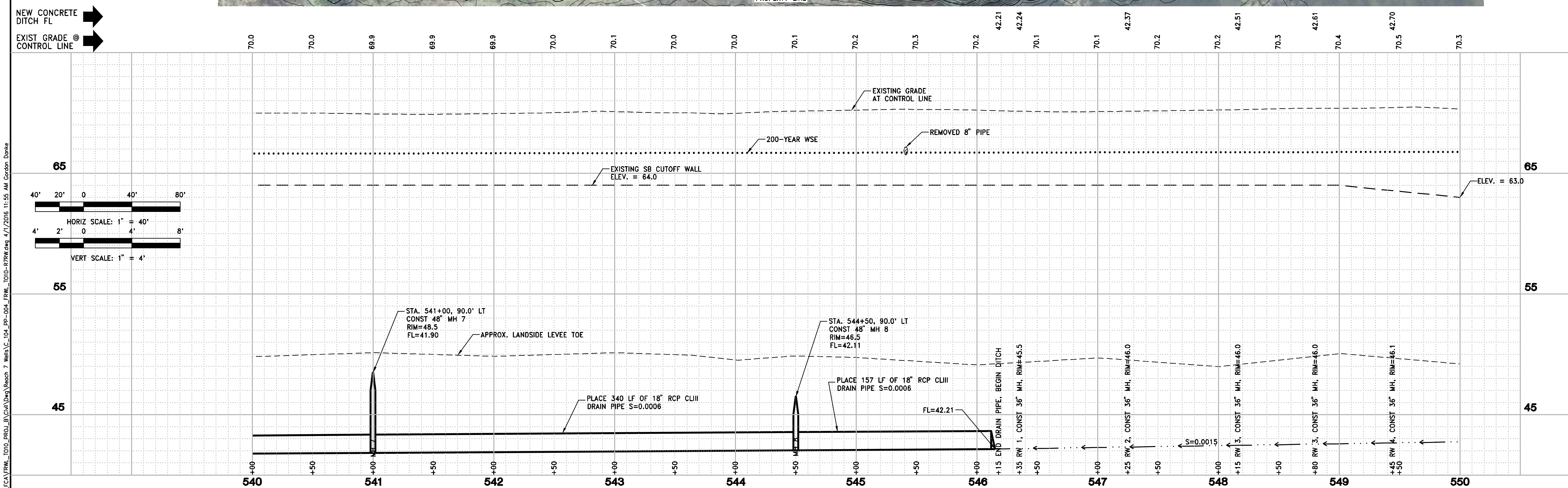
3. CONSTRUCT RELIEF WELL PER DETAIL ON DWG C-302.
4. CONSTRUCT RELIEF WELL DITCH PER DETAIL ON DWG C-303.
5. REMOVE AND SALVAGE PIPE GATE, PLACE GATE AT STA 545+80.
6. REMOVE AND REPLACE EXISTING ROAD PER DETAIL ON DWG C-302.
7. REMOVE EXISTING TOE BERM PER SECTION ON DWG C-301.
8. REMOVE AND DISPOSE OF EXISTING CONCRETE LINED DITCH. FILL WITH RANDON FILL TO MATCH ADJACENT GRADES.
9. CONSTRUCT WIRE MESH FENCE PER DETAIL ON DWG C-305.
10. REMOVE AND DISPOSE OF EXISTING RELIEF WELL FACILITIES. RELIEF WELL SHALL BE ABANDONED IN ACCORDANCE WITH THE LOCAL COUNTY REQUIREMENTS.
11. CONSTRUCT PIPE INLET STRUCTURE AND TRASH RACK PER DETAIL 5 ON DWG C-303.





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VOL 4: FRWL REACH 7 RELIEF WELLS

PLAN & PROFILE

STA 540+00 TO 550+00

VERIFY SCALES
BAR IS ONE INCH ON ORIGINAL DRAWING, ADJUST SCALES FOR REDUCED PLOTS

DRAWING NO. C-104 | SHEET 13

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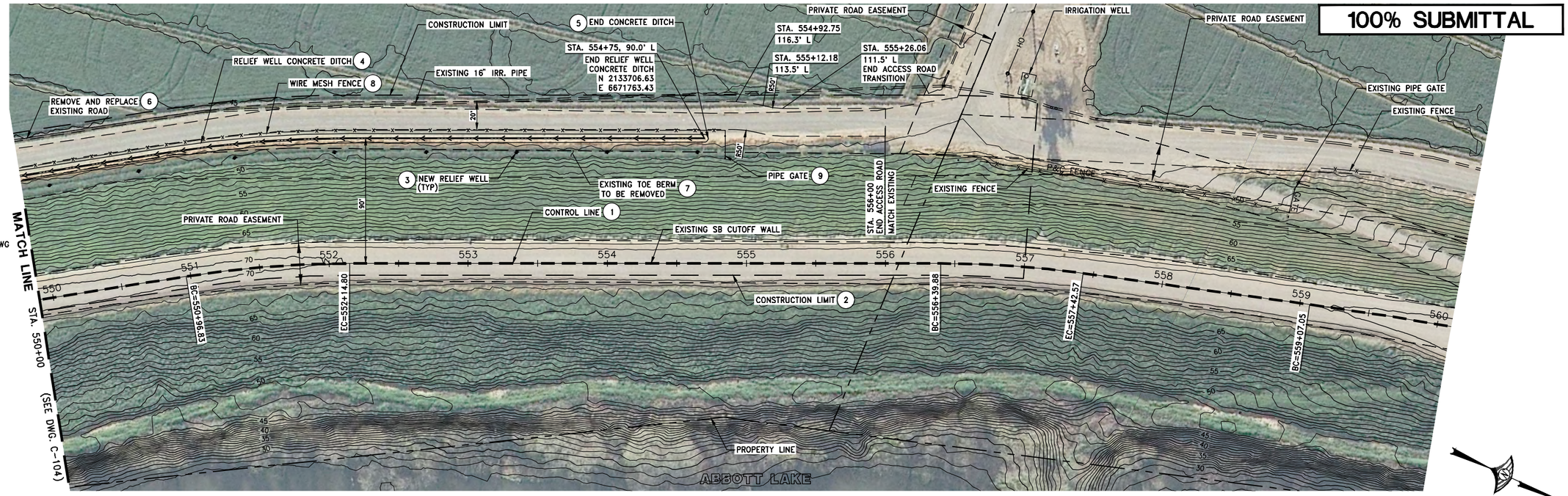
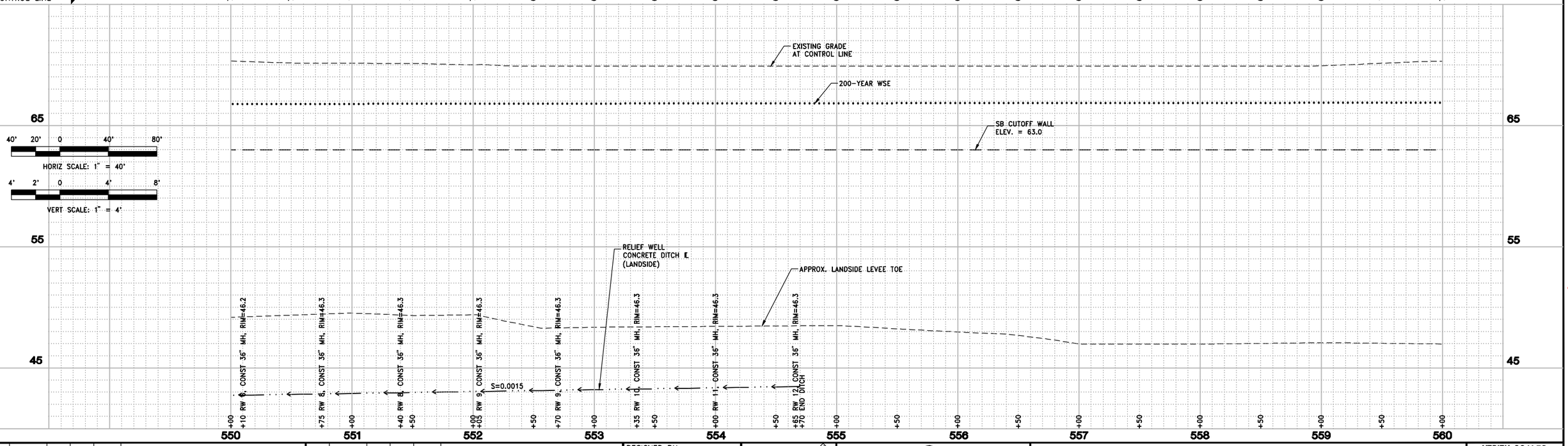
3. CONSTRUCT RELIEF WELL PER DETAIL ON DWG C-302.
4. CONSTRUCT RELIEF WELL DITCH PER DETAIL ON DWG C-303.
5. CONSTRUCT END OF RELIEF WELL DITCH PER DETAIL ON DWG C-304.
6. REMOVE AND REPLACE EXISTING ROAD PER DETAIL ON DWG C-302.
7. REMOVE EXISTING TOE BERM PER SECTION ON DWG C-301.
8. CONSTRUCT WIRE MESH FENCE PER DETAIL ON DWG C-305.
9. CONSTRUCT PIPE GATE PER DETAIL ON DWG C-305.





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SUTTER BUTTE FLOOD CONTROL AGENCY

VOL 4: FRWL REACH 7 RELIEF WELLS

PLAN & PROFILE

STA 550+00 TO 560+00

VERIFY SCALES
BAR IS ONE INCH ON ORIGINAL DRAWING, ADJUST SCALES FOR REDUCED PLOTS
0 1"

DRAWING NO. C-105 | SHEET 14

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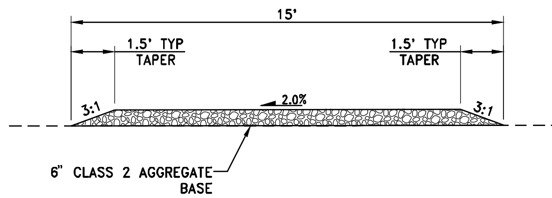
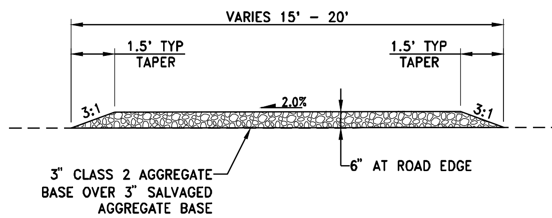
Attachment D - Gap Amendment Design Plans



15' AB ACCESS ROAD DETAIL (1/–)

SCALE: NTS

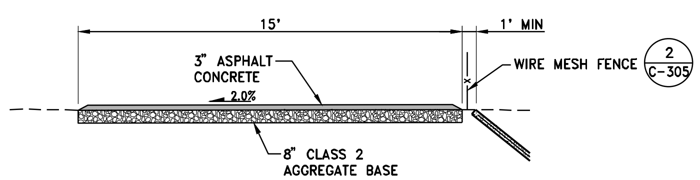
(STA 512+24 TO STA 530+40)



15' – 20' TRANSITION AB ACCESS ROAD DETAIL (2/–)

SCALE: NTS

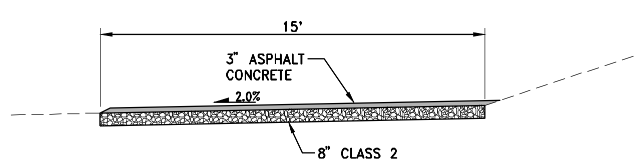
(STA 530+40 TO 532+22)



20' ROAD REPLACEMENT ADJACENT TO DITCH (3/–)

SCALE: NTS

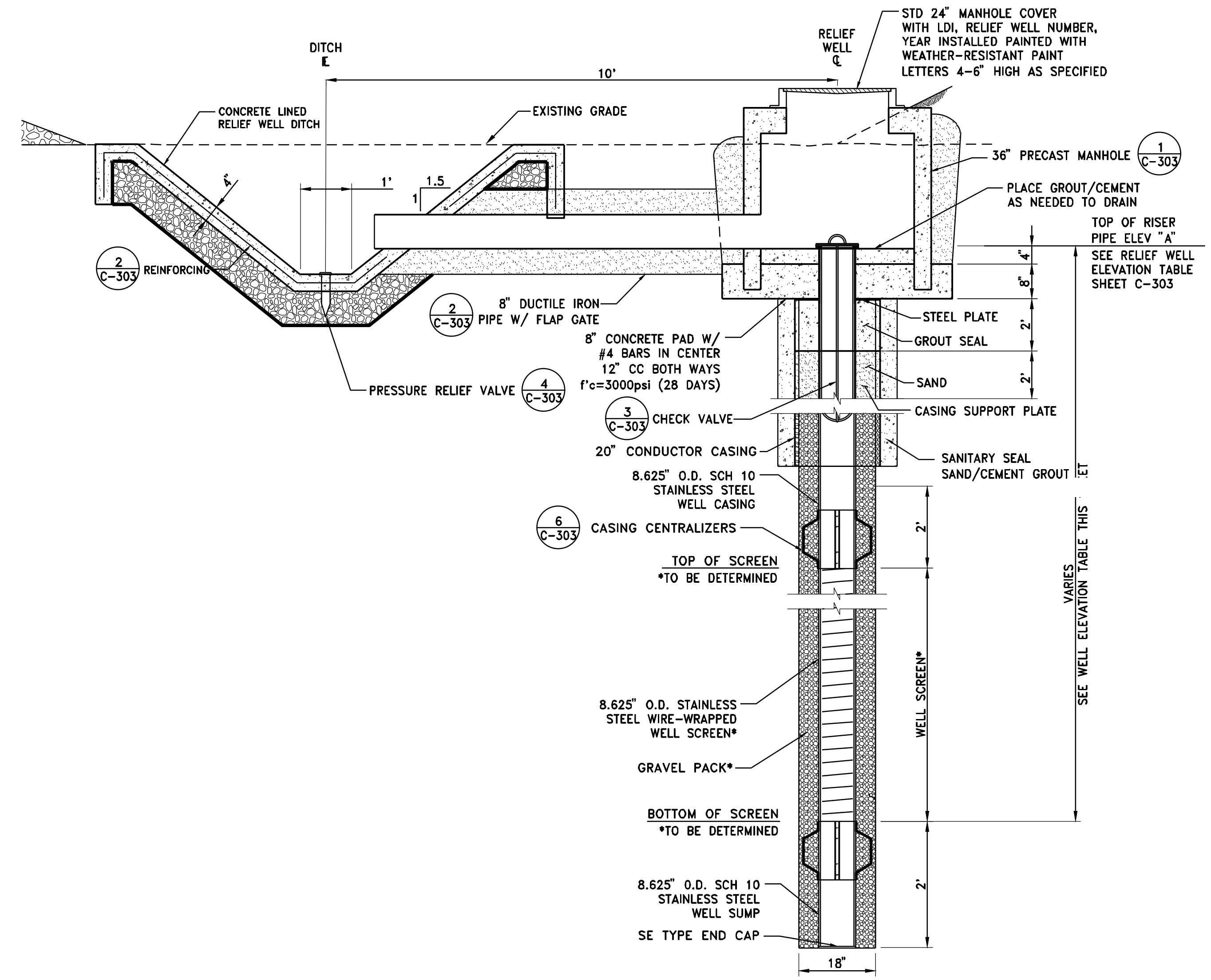
(STA 532+22 TO 554+75)



20' ROAD REPLACEMENT ADJACENT TO LEVEE TOE (4/–)

SCALE: NTS

(STA 554+75 TO 556+26)



TYPICAL RELIEF WELL WITH CONCRETE DITCH (5/–)

SCALE: NTS

BEGIN STATION	END STATION	DEPTH	SPACING
546+35	–	55'	–
547+25	–	65'	–
548+15	554+65	70'	65'

* WELL SCREEN AND GRAVEL PACK TO BE DESIGNED BASED ON SOIL GRADATION OF MATERIAL SAMPLED DURING PILOT HOLE DRILLING. ACTUAL DEPTH OF RELIEF WELL SHALL BE VERIFIED DURING CONSTRUCTION TO CONFIRM A MINIMUM PENETRATION INTO THE AQUACLUDE OF AT LEAST 3 FEET. SEE TECHNICAL SPECIFICATION 33 26 00.00 10 SECTION 1.7 FOR MORE INFORMATION

100% SUBMITTAL

REV.	DATE	BY	CHK.	APPR.	DESCRIPTION	REV.	DATE	BY	CHK.	APPR.	DESCRIPTION

DESIGNED BY: P. BLUM
DRAWN BY: E. EYSTER
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SUTTER BUTTE FLOOD CONTROL AGENCY

VOL 4: FRWL REACH 7 RELIEF WELLS

TYPICAL DETAILS

2 OF 5

VERIFY SCALES
BAR IS ONE INCH ON ORIGINAL DRAWING, ADJUST SCALES FOR REDUCED PLOTS
0 1"

DRAWING NO. C-302 | SHEET 16

J:\Jobs\8455_HDR_Sutter_Butte_FCA\FRWL_T010_PROJ_B\Civil\Dwg\Reach 7 Wells\C_302_DTL-02_FRWL_T010_R7RW.dwg 4/1/2016 11:58 AM Gordon Donke

Attachment D - Gap Amendment Design Plans

Meeting of the Central Valley Flood Protection Board
May 24, 2013

Staff Report

Sutter Butte Flood Control Agency
Feather River West Levee Project
Project Area C (Reaches 13 through 24) Construction Permit
Butte and Sutter Counties

1.0 –REQUESTED ITEM

Consider approval of Draft Permit No. 18793-1 (Attachment – B).

2.0 - APPLICANT

Sutter Butte Flood Control Agency (SBFCA) is the applicant. SBFCA is a joint powers agency formed in 2007 by Butte and Sutter Counties, the cities of Biggs, Gridley, Live Oak and Yuba City, and Levee Districts 1 and 9 of Sutter County (LD 1 and LD 9). The agency has the authority to finance and construct regional levee improvements, and is governed by a 13-member board comprised of elected officials from the cities, counties and levee districts.

3.0 – PROJECT LOCATION

The proposed Project Area C is the first construction phase of the Feather River West Levee Project (FRWLP). The entire FRWLP extends from Thermalito Afterbay in Butte County downstream in a southerly direction approximately 41 miles to a point approximately 3.5 miles north of the Feather River's confluence with the Sutter Bypass in Sutter County (Attachment – A). This first phase of construction (Project Area C) includes 14.78 miles of levee improvements in and around the vicinity of Yuba City. SBFCA has designated Project Area C to include Reaches 13 through 24 of the overall FRWLP. Levee maintenance is performed by Levee District 1, Levee District 9, and the California Department of Water Resources (DWR) in State Maintenance Area 16.

4.0 – AUTHORITY OF THE BOARD

- California Code of Regulations, Title 23 (CCR 23), § 106, Existing Encroachments within an Adopted Plan of Flood Control
- CCR 23, § 112, Streams Regulated and Nonpermissible Work Periods
- CCR 23, § 116, Borrow and Excavation Activities – Land and Channel
- CCR 23, § 120, Levees
- CCR 23, § 121, Erosion Control
- CCR 23, § 123, Pipelines, Conduits and Utility Lines
- CCR 23, § 124, Abandonment of Pipelines
- CCR 23, § 128, Bridges
- Rivers and Harbors Act of 1899, Title 33 United States Code, § 408, hereafter referred to as Section 408

5.0 – PROJECT DESCRIPTION

SBFCA proposes to construct approximately 14.78 miles of levee improvements on the west levee of the Feather River, designated as construction Reaches 13 to 24 (Station 844+75 to 1625+00).

The FRWLP Project Area C proposes to construct a cutoff wall ranging from 26 to 105 feet in depth along the centerline of the levee from Station 844+75 to 1625+00 (Reach 13 to Reach 24, respectively). The levee would be degraded by approximately 50% of its overall height with approximately 2,600 feet of the levee being fully degraded. In addition to the cutoff wall, the FRWLP proposes approximately 5,100 feet of depression infill.

The Central Valley Flood Protection Board (Board) staff has identified several encroachments which do not comply with CCR 23. SBFCA is addressing the majority of the encroachments as described later in this staff report.

6.0 – AGENCY COMMENTS AND ENDORSEMENTS

The comments and endorsements associated with this project are as follows:

- U.S. Army Corps of Engineers (USACE) Washington DC headquarters Section 408 Record of Decision (ROD, anticipated late July 2013)

- USACE Sacramento District Letter of Permission (LOP, transmitted along with the ROD, anticipated late July 2013). The ROD & LOP will be attached to the permit as Exhibit A, and all conditions of the ROD & LOP will be incorporated into the permit by reference.
- DWR Flood Maintenance Office, Maintenance Area 16 endorsement (Exhibit B, dated May 16, 2013).
- LD 1 and LD 9 Board endorsements (Exhibit C).

7.0 – PROJECT BACKGROUND

The Feather River West Levee was originally constructed in the 19th century by local interests. Construction was driven by frequent flooding in the 1860s due to mining debris raising the thalweg elevation of the river beds. The original levee was generally constructed on the Holocene and late-Pleistocene alluvial and fluvial materials deposited by the ancient and modern Feather River and its tributaries.

The FRWL was subjected to several high water and flood events that led to repeated performance problems including levee breaks in 1909, 1914, and 1955. In the 1955 flood the water level was approximately 21 feet high on the levee at the southern end of Yuba City. The flood of 1986 nearly failed the FRWL, and the Yuba River south levee did fail resulting in rapid drawdown of water levels in the Feather River. Widespread flood fighting was necessary from the 5th Street Bridge in Yuba City downstream during the “1997 New Years” flood.

During these floods the FRWL experienced repeated performance problems at many locations, including under-seepage problems causing boils, piping of soil material, and sinkholes. Some locations along the FRWL also experienced other geotechnical problems associated with through-seepage, under-seepage, landside and waterside instabilities and erosion.

In addition to upgrades completed by the early 1960s various improvements to the FRWL have been made at multiple locations, primarily in response to the performance issues observed during large flood events. These improvements have included construction of stability berms, drainage trenches, relief wells, slurry cutoff walls, and other measures.

Various geotechnical studies have been performed to investigate the performance of the FRWL. Between 2007 and 2010 the DWR Urban Levee Evaluation (ULE)

Program investigated nearly the entire length of the FRWL with extensive subsurface exploration and laboratory testing, geotechnical analyses, and information compiled from previous geotechnical studies. The ULE Program focused on evaluating levee seepage and slope stability and identifying the potential levee deficiencies. SBFCA has used some of the ULE Program data with DWR's permission to evaluate and design proposed project.

After forming in 2007 as a joint powers agency, SBFCA embarked on a comprehensive evaluation of the FRWL protecting their member jurisdictions in collaboration with DWR and the Board. This evaluation was necessary to identify deficiencies of the FRWL, their magnitude and severity, and the remedial measures required to address them.

The results of SBFCA's comprehensive evaluation determined that the existing FRWL does suffer from through- and under-seepage, landside and waterside instabilities, and erosion deficiencies, and that a substantial number of geotechnical and other improvements are necessary to bring the FRWL up to current federal and State flood protection standards.

The Feather River west levee is a facility of the Sacramento River Flood Control Project (SRFCP) and State Plan of Flood Control under USACE and Board jurisdictions. This project was conceived prior to adoption of the Central Valley Flood Protection Plan (CVFPP) in June 2012. The FRWLP has been proposed by SBFCA to be an overall betterment to the SRFCP, is consistent with the CVFPP, and will receive DWR Early Implementation Project (EIP) funding.

In light of the flood risk to the area, SBFCA is pursuing the FRWLP in parallel and coordinated with a separate effort by USACE, SBFCA, DWR, and the Board to determine the federal interest in the federal Sutter Basin Project initiated in 2000. The Sutter Basin Project is being evaluated through a Feasibility Study and was selected as a national pilot project to incorporate more efficient, relevant and cost effective practices into the traditional USACE feasibility study process.

SBFCA's project goals are to achieve a minimum 200-year level of flood protection for urbanized and urbanizing areas within the Sutter Basin. A 200-year flood is a flood having a 0.5 percent chance of occurring in any given year, and is also referred to having a 0.5 percent annual exceedance probability (AEP). SBFCA's project proposes to achieve a 200-year level of protection by rehabilitating the FRWL from Thermalito Afterbay to downstream of Star Bend south of Yuba City. The proposed Project Area C described herein is the first planned construction phase of the

FRWLP. SBFCA anticipates submitting subsequent permit applications for remaining construction phases beginning late in 2013.

7.1– Summary of Repair Measures

The overall site plans (Attachment – G), typical levee cross sections (Attachment – F), and typical pipe drawings (Attachment – G) along with the proposed modification of flood management measures by reach (Attachment – M) provide a general overview of the proposed improvements.

SBFCA is proposing to construct slurry cutoff walls of varying depths. Project Area C also includes various utility relocations and approximately 5,100 linear-feet of landside toe depression infill.

SBFCA has identified, and Board staff has confirmed, several construction elements or existing encroachments which do not meet CCR 23 standards (Attachments – J, – K, and – L). These attachments may not provide a complete list all potential non-conforming items at this time. SBFCA has also determined that the items listed in these attachments represent those elements and encroachments that are cost effective, reasonable, and feasible to be addressed during construction of Project Area C. SBFCA is requesting construction variances to CCR 23 standards for these elements to include pipeline crossings, earthwork, and other technical elements.

If, during construction, additional non-conforming items are discovered by any party SBFCA will consider whether or not they can be brought into compliance during construction, and if they can and SBFCA proposes to do so, Board staff will evaluate the proposal(s) for Board approval to be made either by direct Board action or by delegation to the Executive Officer as appropriate.

More details regarding proposed improvements for Project Area C are as follows:

<u>Reaches 13 thru 17 (Shanghai Bend to UPRR Crossing)</u>

- Approximately 5.4 miles (Station 845+00 to 1130+86)
- Conventional cutoff walls with 50 percent levee degrade & rebuild
- Reaches 14 thru 15 are no work reaches due to the presence of an existing cutoff wall (Stations 927+00 to 968+50)
- Reach 13 includes investigation of existing relief wells describes as follows:

There are 81 existing relief wells in Reach 13 that were installed between 1956 and 1998. Relief well pump testing and video inspection work was performed in 2011 and 2012. This work determined that several wells had obstructions and joint gaps in the well screen, but in general the wells were still functioning properly, and any gaps were effectively filtered. Two wells pumped excessive amounts of sand and another had casing defects, so these wells were abandoned in late 2012. SBFCA plans to leave the remaining 78 wells in place until the proposed cutoff wall has been constructed, so that the wells can be used to observe and monitor groundwater conditions during subsequent high water events to assess whether operation of the proposed cutoff wall is successful. Assuming that the wall works as designed, SBFCA plans to convert the remaining wells to observations wells, as they would no longer be needed as a remedy for under-seepage. SBFCA anticipates that it is likely that not all remaining wells would need to be converted, and that some could be abandoned if appropriate. These determinations will be made at a future time. Section 8.4 provides additional discussion on the relief well.

Two features within the footprint of Project Area C, but excluded from the proposed permit, will be constructed in future applications:

- Reach 16: Closure of a gap in the cutoff wall at the Yuba City 5th Street bridge
- Reach 17: Closure structure at UPRR crossing

<u>Reaches 18 thru 24 (UPRR crossing to northern Live Oak)</u>

- Approximately 9.3 miles (Stations 1130+86 through 1625+50)
- Conventional cutoff walls with 50 percent levee degrade & rebuild
- Reach 22 includes approximately 600 linear-feet of levee to be fully degraded and reconstructed due to severe animal burrowing
- Time variance needed for work during February and March of 2014 for reconstruct pipeline crossings at Sunset Pump Station and Campbell Road

7.2 – Project Area C Design Packages

Board staff received and reviewed the following SBFCA design packages:

- 65 percent design documents for the entire 41-mile project received August 2012 in support of program-level Section 408 approval from USACE.

- A Board Action Request was heard on October 26, 2012 to approve sending a

Section 408 request letter to the USACE Sacramento District to alter 41 miles of project levee. The Board unanimously approved the request (Attachment – D), and the letter was signed October 30, 2012.

- 90 percent design documents for Project Area C received December 2012.

- 100 percent design documents and formal permit application received February 2013. The 100 percent documents include the following six contract volumes:

  Volume 1: General and Special Specifications
  Volume 2: Technical Specifications
  Volume 3: Feather River West Levee Improvement Plans Station 844+75 to 1433+83
  Volume 4: Feather River West Levee Improvement Plans Station 1433+83 to 1625+00
  Volume 5: Feather River West Levee Improvement Plans Station Borrow Site and Haul Roads
  Volume 6: Geotechnical Data Report

- 100 percent "Issued for Bid" plan sets received March 12, 2013.

Board staff has reviewed these submittals to develop its current recommendations to the Board. Future phases of construction will be submitted and reviewed in a manner similar to this proposal for Project Area C. Board staff will assign -2, -3, -4, etc. suffix numbers to the 18793 program number as subsequent permit applications are submitted by SBFCA and deemed complete by Board staff.

7.3 – Other federal Regulatory Reviews

USACE's review of the FRWLP under Section 408 triggered the requirement for USACE to comply with the National Environmental Policy Act. The project is also subject to Section 10 of the Rivers and Harbors Act, and Section 404 of the Clean Water Act; for which the USACE also has regulatory authority.

8.0 – PROJECT ANALYSIS

The proposed levee, cutoff wall, construction and utility relocations will be designed and constructed in accordance with the USACE, DWR Urban Levee Design Criteria (ULDC), and Board CCR 23 regulations. The levee modification will have a cutoff

wall for under-seepage. The construction associated with this permit will be completed in two construction seasons. The proposed projects plan milestones are:

- SBFCA opened bids for this project on April 29, 2013. The lowest responsive bidder was Nordic / Magnus Pacific, a joint venture.
- The SBFCA Board approved the award of the contract on May 8, 2013.
- SBFCA proposes to issue a Notice to Proceed on May 27, 2013 if the Board conditionally approves the Area C project described herein.
- SBFCA proposes to begin mobilizing equipment off site (but not on and SRFCP facilities) near the end of June 2013, and be ready to begin construction upon issuance of the final Board permit.

8.1 – Project Design Review

Board staff completed a technical review of the following documents:

- 100% Plans and Specifications for Project Area C (Station 844+75 to 1625+00)
- 100% "Issued for Bid" Plans and Specifications for Project Area C
- 100% Design Documentation Report for Project Area C
- 100% "Issued for Bid" Design Documentation Report for Project Area C
- 100% Technical Specifications for Project Area C
- 100% "Issued for Bid" Technical Specifications for Project Area C
- Addenda 1 and 2
- Draft Environmental Impact Report/Environmental Impact Statement (DEIR/EIS)

8.2 – Project Components

Board staff has reviewed the proposed project bid schedule which includes the following four Bid Schedules:

Bid Schedule A, Preconstruction Submittals Required of the Contractor

Bid Schedule B, (Contract Volume 3) Reaches 13 through 21, Stations 844+75 to 1433+83

Work Description	Estimated Quantities
Project fencing	99,800 feet
Remove county parking structure	1 each
Remove well and pumps (Sta. 881+65, 1174+00, 1200+60)	3 each
Remove / dispose 15-inch irrigation pipe (Sta. 1363+50 to 1375+50)	1,200 ft
Remove existing asphalt	13,300 sy

Remove existing ag base	21,500 sy
Topsoil stripping	176,760 cy
Levee excavation	911,700 cy
Toe berm fill (Sta. 1023+40 to 1028+00)	3,400 cy
Random fill: canal (Sta. 1107+00 to 1125+60) and other	122,100 cy
Soil bentonite cutoff wall (open trench)	1,739,600 sf
Soil bentonite cutoff wall (deep trench)	567,600 sf
Levee embankment fill (Type-1, clay)	194,500 cy
Levee embankment fill (Type-2, granular soil)	730,400 cy
New asphalt	1,610 tons
New Class 2 ag base	7,300 tons
Remove and reinstall existing gates	22 each
Erosion control seeding	219.3 acres
Haul & waste (unsuitable soil)	1,000 cy
Concrete lined ditches	575 lf
Steel Sheet Pile Wall, SEWD	3,750 sf
Temporary Irrigation bypasses (1229+41, 1265+59)	2 each
Pipes [6 inch to 60 inch diameter]	30 each

(Attachment – K, Levee Encroachment List for a portion of the pipeline crossings requiring variances to Board standards)

Bid Schedule C (Contract Volume 4) Reaches 22 through 24, Stations 1433+83 to 1625+00

Work Description	Estimated Quantity
Project fencing	39,800 ft
Clearing & grubbing	34 acres
Soil bentonite cutoff wall	665,000 sf
Type-1 levee embankment fill	42,400 cy
Type-2 levee embankment fill	105,000 cy
Random fill	24,000 cy
Class 2 aggregate surfacing	6,700 tons
Asphalt concrete paving	395 tons
Top soil stripping	39,900 cy
Steel sheet pile wall, Lateral 12 (Station 1610+92)	3,255 sf
Remove and salvage existing aggregate road surfacing	18,000 lf
Caltrans temporary K-rails	370 lf
Remove and reinstall existing gates	14 each
Erosion control seeding	219.3 acres
Haul & waste (unsuitable soil)	1,000 cy
Pipes [6 inch to 36 inch diameter]	7 each

(Attachment – K, Levee Encroachment List for a portion of the pipeline crossings requiring variances to Board standards)

Bid Schedule D (Owner-furnished borrow material)

Mobilization, Traffic Control, Clearing & Grubbing, Public Road maintenance, storm water pollution control, borrow restoration	
Excavation	270,000 cy
Top soil stripping, restoration, erosion control	22.5 acres

Real Estate

Board staff reviewed adjacent project landowner maps created with Parcel Quest software (Attachment – I). Staff then mailed those landowners standard Adjacent Landowner Letters alerting them of the proposed project and their right to protest under CCR 23, § 12, Protests. As of May 16, 2013 Board staff has not received any formal written protests.

8.3 – Hydraulic Analysis

Board staff has reviewed SBFCA's hydraulic analysis. The analysis computed various design water surface profiles and evaluated the incremental hydraulic impacts resulting from levee improvement measures designed to achieve a 200-year level of flood protection for the urban and urbanizing northern portion of the Sutter-Yuba City Basin, and to achieve 100-year protection south of Star Bend downstream of Yuba City. The analysis modeled 44 miles of the Feather River from Thermalito Afterbay to the Sutter Bypass to include proper boundary conditions. This modeling included both the 41-miles of project in the Section 408 request to the USACE, and the Project Area C construction project described herein.

SBFCA and their consultant, Peterson Brustad, Inc (PBI) stated in their Design Water Surface Profile for the FRWLP dated March 2012, and in their hydraulic Addendum No.1 dated July 2012, that the project will have no incremental adverse impacts to the Feather River West Levee or the SRFCP.

The hydraulic analysis computed the 100-, 200- and 500-year design water surface profiles and evaluated the incremental hydraulic impacts resulting from levee improvement measures designed to achieve a 200-year level of flood protection for the urban and urbanizing northern portion of the Sutter-Yuba City Basin, and 100-year protection south of Yuba City. The analysis modeled the entire 44 miles of the Feather River from Thermalito Afterbay to the Sutter Bypass. The water surface profile is attached to this Staff Report as Attachment – H.

PBI modeled the FRWLP using the “Shanghai” storm centering and the inflows were applied to the most upstream cross sections of the HEC-RAS model. The annual exceedance probability (AEP) peak inflow values were modeled as:

1/100 AEP = 150,000 cfs
1/200 AEP = 174,000 cfs (goal of this project)
1/500 AEP = 327,000 cfs

By comparison the USACE Levee and Channel profile dated March 15, 1957 lists the design flow rate in the Feather River through Project Area C to the Yuba River confluence at 210,000 cfs. Below the Yuba River confluence the design flow rate is 300,000 cfs.

The hydraulic analysis utilized the USACE HEC-RAS model that is also being used by the USACE as part of the Sutter Basin Feasibility Study (SBFS). The SBFS is a separate collaborative effort between the USACE, DWR and SBFCA to evaluate flood damage reduction, ecosystem restoration, and recreation projects within the Sutter-Yuba City basin. The HEC-RAS model was calibrated using gage data and surveyed high water marks from two historical flood events that occurred in 1997 and 2006.

The results of the hydraulic analysis indicate that the 100-year plus 3 feet water surface profile and the 200-year plus 3 feet water surface profile are contained within the channel, with one exception occurring at the Union Pacific Railroad Bridge (Station 1131+00). The model results predict that this location will be submerged at the 200-year flood discharge. SBFCA is proposing a closure structure where the railroad tracks intersect the levee; however, this work is not part of Project Area C. Board staff will continue to work with SBFCA over the next year on the physical solution to the railroad crossing.

8.4 – Geotechnical Analysis

This section provides a detailed report on the geotechnical aspects of the project.

The Project Area C is approximately a 14.78-mile long segment of the overall four segments of the proposed FRWL improvement project. The Project Area C extends from north of Shanghai Bend (Station 844+75) to a point approximately ¼ mile north of Campbell Road in the City of Live Oak (Station 1625+00). In terms of reaches, the Project Area C has been divided into 12 reaches which extend from reach 13 (south) through Reach 24 (north). Each reach in the Project Area C has been

evaluated for susceptibility to through seepage, under-seepage, slope stability, and geometry deficiencies. Predominant deficiencies at the Project Area C determined by the geotechnical analyses are the levee through seepage and under-seepage. The Project Area C will entail the construction of approximately 13 miles of soil-bentonite cutoff wall along with 400 linear feet of toe berm construction.

The recommended depths for the cutoff walls range from approximately 26 to 105 feet in depth. The recommended wall depths are not constant over the length of a reach, but vary along the reach to correspond to the varying subsurface conditions. In addition to the seepage mitigation, the removal, relocation, and modification of a large number of levee encroachments are included as a part of the project.

Where necessary within Project Area C levee encroachments will be addressed where no new seepage mitigation has been proposed. For example, pipes will be fitted with positive closure devices at the Gilsizer Slough Drainage Outfall Pipe location, where an existing cutoff wall is located already. Therefore, no new seepage mitigation has been proposed at this location. Table 1 provides a summary of levee deficiencies by reach for Project Area C.

Table 1. Summary of Levee Deficiencies by Reach

Study Reach	Through-Seepage[a]	Under-Seepage[b]	Slope Stability[c]	Erosion	Encroachments
13	X	X	*		X
14					
15	X	X	*		X
16			X	X	X
17	X	X	*		X
18	X	X	*		X
19	X	X	*		X
20		X	*		X
21		X	*		X
22	X	X	*		X
23		X	*		X
24		X	*		X

Notes: An X signifies the levee deficiency applies to the levee reach.
[a] Through-seepage issues based on phreatic surface existing on the landside slope.
[b] Under-seepage issues based on exit gradient greater than 0.5 at the landside levee toe.
[c] A * signifies areas where through- and under-seepage issues exist and slope stability was not independently verified.

Among all the reaches within the Project Area C, Reach 13 is the most challenging reach in terms of geotechnical stability as Reach 13 experienced levee breaches and seepage problems in 1955, 1986 and 1997 flood events. In 1955 flood event, the levee at this reach breached. The levee alignment was then setback from its previous alignment that experienced the 1955 levee breach occurred. In 1986 and

1997 flood events, seepage boils occurred at the landside of the levee. The mitigation measures presently associated with this reach include the relief wells that were constructed in 1956 and in the 1990s. Reach 13 extends from Station 845+00 to Station 927+00 which is located at the north of Shanghai Bend. This reach is approximately 8,200 feet long.

Geotechnical analyses conducted in Reach 13 include steady-state seepage analyses, landside slope stability analyses, and waterside rapid drawdown analyses. Geotechnical analyses were performed at locations identified as being the most critical for the design in order to confirm the effectiveness of the design. Sensitivity analyses were performed at many locations to support the conclusions and recommendations of the design.

Based on the geotechnical evaluations prepared for Reach 13, DWR recommended additional geotechnical explorations to check the depth and continuity of the deep aquiclude layer beneath the levee. Based on the DWR's recommendations, a total of eight (8) additional explorations were performed in Reach 13 to provide additional information regarding the depth and continuity of the deep aquiclude layer. Using the results of the additional explorations along with the existing explorations, further geotechnical analyses were conducted at two cross-sections located at Stations 861+33 and 907+00 in Reach 13. Based on the updated analyses, along with the results of the 2012 pump tests of the existing relief wells, SBFCA's consultant team, the URS Corporation, updated the mitigation measure recommendations at this reach.

A total of eight exploratory borings were performed (boring numbers: SL001_002S through SL001 _009S) from October 2 to October 20, 2012. These exploratory borings were advanced using sonic drilling technique. Five (5) of these exploratory borings were advanced from crown locations and the remaining three (3) exploratory borings were advanced at landside toe locations. The depths of supplemental crown exploratory borings varied between 120 and 135 feet and the depths of landside toe exploratory borings varied between 90 and 97.5 feet. The locations of these exploratory borings were selected generally at areas where a data gap was present. Laboratory testing was also performed on selected soil samples from these supplemental exploratory borings. The laboratory testing included water content tests, Atterberg limits tests, sieve analyses, and gradation analyses.

Based on the updated evaluation, the cutoff wall depths for the central and southern portion of Reach 13 were revised. A greater cutoff wall depth is now recommended and the cutoff wall is expected to be fully penetrating. This option also eliminates

the need for relief wells in Reach 13, provided that the complete penetration of the cutoff wall into the aquiclude layer is confirmed during construction. The recommended cutoff wall depths in Reach 13 range from approximately 90 feet in the southern portion and approximately 45 feet in the northern portion from the landside toe elevations.

Based on the supplemental explorations and geotechnical analyses at Stations 861+33 and 907+00 the cutoff wall tip elevations were updated as follows:

- From Station 844+50 to 848+00, the cutoff wall tip elevation is -20 feet.
- From Station 848+00 to 896+00, the cutoff wall tip elevation is -38 feet.
- From Station 896+00 to 923+75, the cutoff wall tip elevation is +25 feet.

Based on the supplemental explorations and geotechnical analyses at Stations 861+33 and 907+00, URS provided the following recommendations regarding the existing Relief Wells:

- Relief wells that pumped sand, appeared non-functional, or have internal defects based on 2012 relief well testing have been abandoned. An emergency action plan will be implemented until the cutoff wall is in place.
- Relief wells that appeared functional based on 2012 relief well testing will be converted into observation wells as part of future construction contracts.
- Buried collector pipes for the existing relief wells will be abandoned and backfilled, and the release points of the collector pipes should be raised to the ground surface as part of future construction contracts.
- Water levels in observation wells and any flow from them will be monitored and recorded during periods of high water in the river.

At the request of DWR three additional explorations were also conducted in Reaches 22, 23 and 24 within Project Area C. The purpose of these explorations was to explore the continuity of the aquiclude layer landward of the levee. The locations of the three explorations are: SM0016_001B at Reach 22 (Station 1499+00); SM0016_002B at Reach 23 (Station 1517+00); and SM0016_003B at Reach 24 (Station 1615+00).

SM0016_001B was drilled to a depth of 46.5 feet below the ground surface (bgs), at the toe of the levee, adjacent to the existing crown exploration, WM0016_ 010C which identified approximately 7-foot thick aquiclude layer between elevations +52 feet and +59 feet. SM0016_002B was drilled to a depth of 51.5 feet bgs, at the toe of the levee, adjacent to the existing crown exploration, WM0016_ 012C which

identified approximately 9-foot thick aquiclude layer between elevations +58 feet and +69 feet. SM0016_003B was drilled to a depth of 72 feet bgs, at the toe of the levee, adjacent to the existing crown exploration, WM0016_ 020B which identified an aquiclude layer at a depth of approximately 50 feet below the landside toe (elevation +32 feet). Based on the findings of the three additional explorations, the landward continuity of the aquiclude layer was confirmed in all cases.

Based on the geotechnical analyses performed for Project Area C, the seepage and stability issues are not apparent with the proposed project mitigation. Rapid drawdown issues are also not apparent in this segment.

During construction of the cutoff wall the levee will be degraded completely between Stations 844+50 and Stations 896+00 within Reach 13. Rock slope protection is presently installed between Stations 844+50 and 896+00. DWR has requested SBFCA to replace the waterside rip-rap when the levee is rebuilt at these locations.

No settlement analyses were conducted within Project Area C. Additional settlement is not expected as the foundation soils are consolidated and no additional materials are proposed to be added.

The use of existing sandy soils to reconstruct the levee in areas outside of the cutoff wall cap zone is not expected to pose a threat to levee stability. However the use of existing sandy soils to reconstruct the levee at the waterside may result in long-term erosion issues that could require a long-term maintenance commitment to address.

A toe berm will be constructed at the tunnel beneath the 10th Street Bridge in Yuba City at Reach 16 by placing fill to a height of approximately seven feet. The 400-foot long toe berm will be constructed at this location to close a gap that currently exists between two existing cutoff walls. This toe berm is expected to mitigate for through-seepage. Gaps in the cutoff wall at the 5th Street Bridge, located in Reach 16, and the UPRR railroad crossing, will not be closed as part of the Area C construction project. These cutoff wall gaps will be addressed in a future construction phase to allow additional time to coordinate work with the City of Yuba City and UPRR.

As per the technical specifications the compaction of the cohesive soils are proposed to be performed as a percentage of the maximum dry density per ASTM D698, and the compaction of the cohesionless soils are proposed to be performed as a percentage of the relative density as per ASTM D4253 and ASTM D4254. When ASTM D698 will be used for compaction, the relative compaction will be at least ninety seven (97) percent of the maximum laboratory dry density with a

moisture content ranging between -1% and +3% of optimum moisture content. The moisture content requirement proposed by SBFCA will require a variance to the Board's standards in CCR 23, § 120 since this section requires that compaction be performed at above optimum moisture content. The use of ASTM D4253 and ASTM D4254 for compacting cohesionless soils will also require a variance to the standards as CCR 23, § 120 only allows to use of either ASTM D 693 or ASTM D 1557 for soil compaction.

8.5 – Variances to Board Standards per CCR 23, § 11(a) and (b)

Section 11 of the Board's CCR 23 regulations state:

"(a) An applicant for an encroachment permit for a use that is not consistent with the board's standards as outlined in Article 8 of CCR 23 requires a variance approved by the board.
(b) When approval of an encroachment requires a variance, the applicant must clearly state in the application why compliance with the board's standards is infeasible or not appropriate."

SBFCA is requesting variances to the following Board CCR 23 Standards:

- CCR 23, § 120; Levees
- CCR 23, § 123, Pipelines, Conduits, and Utility Lines
- CCR 23, § 124; Abandoned Pipelines and Conduits

8.5.1 - <u>Variance Category 1</u> – Issues raised by Board staff in their October 2012 Section 408 Request Staff Report (Attachment – J)

Addresses Project Area C items, from the Section 408 Request Staff Report for Application No. 18793 approved by the Board on October 26, 2012.

The October 2012 Section 408 request Staff Report listed 17 items that were to be resolved between Board and SBFCA staffs. Attachment – J states Board staff's original concerns, SBFCA responses, and Board staff's final response.

<u>Six</u> items (E, F, L, M, N, and Q) are addressed through proposed variances to Board standards.

<u>Nine</u> items (B, C, D, G, H, J, K, O, and P) have been resolved by Board and SBFCA staff collaboration.

Two items (A and I) are addressed by draft permit conditions SEVENTY THREE AND EIGHTY FOUR in the draft permit (Attachment – B).

8.5.2 - Variance Category 2 – Pipeline crossings deviating from CCR 23: (Attachment – K)

SBFCA is requesting construction variances to CCR 23 § 123 -Pipelines, Conduits, and Utility Lines for the following twenty-two pipeline crossings:

Reach	Station	Pipe
13	856+08	24” storm drain pump station
13	856+23	24” seepage interceptor pump station
~~13~~	~~881+43~~	~~14” relief well pump station~~ (to be removed, no variance)
~~13~~	~~881+40~~	~~6” relief well pump station~~ (to be removed, no variance)
13	893+78	16” storm drain
13	893+34	12” storm drain
16	972+29	2” waterline
16	1043+03	16” storm drain
16	1043+22	24” storm drain
16	1043+27	24” wrapped steel pipe
16	1043+45	36” discharge pipe
17	1096+62	42” waterline crossing
17	1096+71	24” waterline crossing
17	1096+81	28” waterline crossing
17	1111+46	16” storm drain discharge pipe
17	1127+48	10” outfall pipe
17	1132+09	9” fuel line
19	1229+41	16” steel pipe through levee
19	1265+59	14” steel pipe through levee
20	1314+80	20” steel discharge pipe
21	1430+40	36” steel pipe through levee
21	1430+47	60” steel pipe through levee
21	1430+55	60” steel pipe through levee
~~23~~	~~1536+12~~	~~36” cement mortar pipe through levee~~ (to be removed, no variance)
24	1610+92	18” cement mortar pipe through levee

The following subsections of CCR 23 § 123 are stated here in their entirety and are provided in an abbreviated form as part of Attachment – K which lists the specific variances to § 123 proposed for construction.

Subsection (d)(7) *"Pipelines carrying gas or fluids under pressure must have a readily accessible rapid closure device located within ten (10) feet of the landside levee toe."*

Subsection (d)(9) *"The side slopes of trenches excavated for the installation of pipelines, conduits, or utility lines may be no steeper than one (1) foot horizontal to one (1) foot vertical…"*

Subsection (d)(11) *"The minimum cover for pipelines, conduits, and utility lines installed through the levee crown is twenty-four (24) inches. If it becomes necessary to raise a levee crown to provide minimum cover, the longitudinal slope of the crown must be a minimum of ten (10) feet horizontal to one (1) foot vertical. Where twenty-four (24) inches of cover is not practical, a concrete or other engineered cover is required."*

Subsection (d)(13) " *When practical, pipelines, conduits, and utility lines installed within a levee section must be separated from parallel pipelines conduits, and utility lines by a minimum of twelve (12) inches, or the diameter of the largest pipeline, conduits, and utility lines whichever is larger, to a maximum of thirty-six (36) inches."*

Subsection (d)(20) *"Within the levee or within ten (10) feet of levee toes, any excavation for the installation of a pipeline, conduit, or utility line must be backfilled in four (4) to six- (6) inch layers with approved material and compacted to a relative compaction of not less than ninety (90) percent. Per ASTM D1557-91, dated 1991, which is incorporated by reference and above optimum moisture content or ninety-seven (97) percent, per ASTM D698-91, dated 1991, which is incorporated by reference and at or above optimum moisture content. Compaction tests by a certified soils laboratory will be required to verify compaction of backfill within a levee."*

Subsection (e)(1) *" One or more of the following conditions must apply: (A)The pipeline, conduit, or utility line will be maintained by a public agency with a history of good maintenance based upon annual maintenance or inspection reports. (B) The levee is designed to withstand a depth of less than six (6) feet of water measured with respect to the elevation of the landside levee toe. (C) The levee is designed to withstand a depth of less than twelve (12) feet of water measured with respect to the elevation of the landside levee toe and*

provides flood protection for a rural area, or an area where the board anticipates little future urban development."

Subsection (g)(7) *" Steel pipe may be used for all types of pipeline or conduit installations through a levee above the design flood plane if the pipe meets the following requirements:*
(A) The steel pipe is resilient and not materially reduced in quality due to weathering, prior use or other deteriorating conditions.
(B) The steel pipe joints are butt-welded or threaded.
(C) The steel pipe installations are corrosion-proofed externally with a coating of material such as coal-tar enamel, asphalt-dipped wrap, mortar, PVC tape, or polyethylene tape wrapped to a thickness of thirty (30) mils, high solids epoxy, or equivalent.
(D) Unless a continuous internal lining of cement, mortar, or equivalent is provided, as appropriate for the fluid to be conveyed, new steel pipe installations may convey only non- corrosive material, and water is considered corrosive.
(E) Steel pipe installations must be designed to resist all anticipated loading conditions, and the design calculations must be submitted to the board. Steel pipe meeting the following criteria may be used without submittal of design calculations to the board:
(i) Twelve- (12) inches in diameter or less ten- (10) gauge steel pipe.
(ii) Greater than twelve- (12) inches and a maximum of thirty- (30) inches in diameter seven- (7) gauge steel pipe.
(iii) Greater than thirty- (30) inches and a maximum of forty-eight (48) inches in diameter three- (3) gauge steel pipe.

Staff agrees with SBFCA's assessment of requested pipeline crossing variances to CCR 23 § 123 standards as described in Attachment – K and recommends approval of the requested variances.

8.5.3 - Variance Category 3; Major Time Variance Requests:

Four Major Time Variance Requests (TVR) to CCR 23, § 112, Streams Regulated and Nonpermissible work periods, sub-paragraph (b)(2), for work proposed to be performed during the flood season between November 1 and April 15. (Attachment – K)

SBFCA is requesting time variances to perform work between February 1 and April 15 at the following pipeline crossings:

- Station 1430+40 36" steel low pressure through levee (Sunset Pump Sta.)
- Station 1430+47 60" steel low pressure through levee (Sunset Pump Sta.)
- Station 1430+55 60" steel low pressure through levee (Sunset Pump Sta.)
- Station 1610+92 36" gravity storm drain (RD 777 lateral 12)

These four crossings are on SBFCA's critical path for construction and require draining the Sutter Butte Main Canal in order to perform the pipe removal and replacement work. The irrigation canal must be operable to irrigate crops between March 20 and January 31, which would therefore make construction of these crossings extremely difficult to schedule and construct.

With the Board's acceptance of this TVR, the contractor will be able to remove and replace these pipelines in a safe and expeditious manner between February 1 and March 20, as required to meet the critical path of the proposed construction schedule. The permit conditions require that if inclement weather occurs the Board's Chief Engineer has the authority to stop work.

8.5.4 – Variance Category 4; Levee Earthwork Variances deviating from CCR 23, § 120 Levees

Detailed descriptions of three earthwork variance categories (EW-1, 2 and 3 are described in detail in Attachment – L.

EW-1. Use of Non-Impervious Soil in Outer Shells for Reconstructed Zoned Levee.
EW-2. Compaction Requirements for Cohesionless Fill.
EW-3. Moisture Content for Cohesive Fill.

Staff agrees with SBFCA's assessment of requested earthwork variances to CCR 23 § 120 standards as described in Attachment – L and recommends Board approval of the requested variances.

8.5.5 – Pipe Owner Permits; Project Area C:

There are 38 pipeline encroachments (excluding lines owned by PG&E or AT&T) within Project Area C. SBFCA proposes to:

- remove or replace 22 pipelines
- remove and dispose 15 pipelines
- abandon in place 1 pipeline

These pipeline crossings fall into the following categories:

- Owner has an existing Board permit.
- Owner does not have an existing Board permit.

- The pre-1955 pipeline is grandfathered into the SRFCP via the Operations and Maintenance manual.
- Permit status or owner has not been confirmed.

At a meeting held May 13, 2013 staffs from SBFCA, the Board, DWR Levee Inspections, DWR Maintenance, and the USACE agreed to a strategy to (1) update existing permits so they conform to current CCR 23 regulations and USACE policies, or (2) issue permits to previously unpermitted encroachments so that all regulatory parties will be able to effectively track and inspect future operations and maintenance of these encroachments.

SBFCA has agreed to act on each owner's behalf to prepare all required encroachment permit application documents, obtain owner signatures, and support the Board staff's application review and permitting activities. Draft permit condition FORTY ONE is proposed to address these procedures.

Board staff recommends that the Board approve these procedures and delegate authority to the Executive Officer to process these permits throughout the course of the Project Area C construction.

The following table summarizes the pipeline owners, locations, and current permit status:

Pipe Owner	Levee Station	CVFPB Permit
Yuba City c/o Diana Langley	1043+03, 1096+62	Yes, Yes
	1096+71, 1096+81	Yes, Yes
	1111+46	Yes
	856+08, 856+23	Yes, Yes
	893+78, 893+84	Yes, Yes
	1043+52	Abandon
Gilsizer County Drainage District, c/o Diana Langley	1043+22, 1043+27	Yes, Yes
	1043+45	Yes
Sutter County, c/o LD 1	972+29	Unknown
Sutter Extension Water District, c/o Lynn Phillips	1430+40, 1430+47	No, pipe xing
	1430+55	No, pipe xing
Micheli; River Bottom Ranch	1314+80	Yes

Richland Enterprises; c/o Balbir Sohal, Amarjit Sohal	1265+59	Pre-1955
Kewal and Resham Singh	1229+41	Pre-1955
Valley Green Mobil Homes Park	1127+48	Yes
RD 777 claims unknown owner	1610+92	No
Manjinder Bains Property	1536+12	Remove

8.6 – Project Benefits

The Area C project is expected to provide the following benefits:

- Address major geotechnical concerns such as through- and under-seepage, slope stability, and condition and impact of existing encroachments.

- Reduce the risk of flooding for existing urban areas, agricultural commodities, infrastructure, and other properties.

- Increase the level of flood protection to a targeted 200-year level for Yuba City and Live Oak consistent with the adopted CVFPP, and consistent with the legislative mandates of Senate Bill 5 (Statutes of 2008) to provide 200-year flood protection for urban and urbanizing areas.

- Bring encroachments surveyed by SBFCA into CCR 23 compliance while addressing 100 percent of the encroachment issues categorized by the USACE in their 2010 periodic inspections as “Unacceptable – likely to prevent performance in the next flood event.”

9.0 – CEQA ANALYSIS

Board staff has prepared the following CEQA Findings:

The Board, acting as a responsible agency under CEQA, has independently reviewed the Feather River West Levee Project Draft Environmental Impact Report (DEIR) (SCH No. 2011052062, December 2012) the Final Environmental Impact Report (FEIR) (SCH No. 2011052062, April 2013) and the Mitigation Monitoring and Reporting Plan (MMRP) submitted by SBFCA. The SBFCA as lead agency determined the project would have a significant effect on the environment and adopted Resolutions 2013-05 and 2013-06 on April 10, 2013 (including Statement of Facts, Findings, Impacts and Mitigation Measures, Statement of Overriding

Considerations and Mitigation Monitoring and Reporting Program) and subsequently filed a Notice of Determination with the State Clearinghouse on April 12, 2013.

These documents including project design and may be viewed or downloaded from the Central Valley Flood Protection Board website at http://www.cvfpb.ca.gov/meetings/2013/5-24-2013.cfm under a link for this agenda item. The documents and other materials which constitute the record of the Central Valley Flood Board's proceedings in this matter are in the custody of Jay Punia, Executive Officer, Central Valley Flood Protection Board, 3310 El Camino Ave., Room 151, Sacramento, California 95821. The documents are also available for review in hard copy at the SBFCA office.

9.1 – Impacts that can be Mitigated

The FEIR identified certain potentially significant environmental impacts that can be reduced to less than significant with the implementation of identified mitigation measures. The significant impacts and the mitigation measures to reduce them to less than significant are adopted in the SBFCA Resolution 2013-06 dated April 10, 2013 (which includes a Statement of Facts, Findings, Impacts and Mitigation Measures, Statement of Overriding Considerations and Mitigation Monitoring and Reporting Program). Based on its independent review of the DEIR, FEIR and SBFCA Resolution 2013-06, the Board finds that for each of the significant impacts described, changes or alterations have been required in, or incorporated into, the project which avoid or substantially lessen the significant environmental effects as identified in the FEIR. Moreover, such changes or alterations are within the responsibility and jurisdiction of another public agency, SBFCA, and such changes have been adopted by that agency.

9.2 - Significant Unavoidable Adverse Impacts of the Project

The FEIR also identified certain potentially significant environmental impacts that were deemed to remain significant even after the adoption of mitigation measures. The following impacts of the proposed project remain significant following adoption and implementation of the mitigation measures described in the FEIR:

- Air quality – The project could exceed applicable thresholds for construction emissions. SBFCA will provide an Advance Notification of Construction Schedule and a 24-Hour Hotline to Residents; implement a Fugitive Dust Control Plan and measures to reduce emissions. Fees will be paid to offset annual construction emissions to net zero (0);

- Noise – The project could result in temporary construction-related noise, up to 24 hours per day. To the extent feasible SBFCA will control noise from construction activity such that noise does not exceed applicable noise standards;

- Vegetation and wetlands - The project would result in loss of wetlands and vegetation. For direct effects on woody riparian trees that cannot be avoided, SBFCA will compensate for the loss of riparian habitat to ensure no net loss of habitat functions and values. Compensation ratios will be based on site specific information and determined through coordination with the appropriate State and federal agencies during the permitting process;

- Visual resources - The project could result in impacts to visual resources. Residential viewers would experience construction in both rural and urban reaches during more than one construction season (typically April 15 to November 30, subject to conditions). In general, construction operations at the levee and borrow sites, construction traffic, haul trucks, and staging areas would be visible in the foreground and middle-ground to residents, businesses, roadway users, and recreationists;

- Cultural resources - The project could result in cumulative impacts to cultural resources. The project may result in the demolition of individual structures and residences that contribute to rural historic landscapes. Other projects that form the cumulative context may contribute to these effects through plan build-out, levee repair, or other actions requiring demolition of structures forming portions of rural historic landscapes also affected by the FRWLP. For these reasons, the FRWLP may contribute to cumulatively significant and unavoidable effects on rural historic landscapes. SBFCA will develop and implement treatment for avoidance and preservation in place or relocation of individual California Register of Historic Resources that are eligible buildings (noncontributing or unaffected buildings would remain in place). Where avoidance or relocation is not feasible, standard treatment such as documentation through the Historic American Buildings Survey, Historic American Landscape Survey, Historic American Engineering Record, or district documentation will be completed. Interpretive displays, online resource, and historic contexts or walking tours may also be used, as appropriate.

For each of these impacts, as described in the FEIR and SBFCA's Adopted Resolution 2013-06, the Board finds that the impact will remain significant even after the adoption of all mitigation measures.

9.3 – Statement of Overriding Considerations

For each of the unavoidable potentially significant impacts of the project described above, the Board finds that the project's benefits outweigh the unavoidable adverse environmental effects and are, therefore, acceptable. The Board further finds that none of the significant unavoidable adverse impacts of the project are within the Board's jurisdiction.

SBFCA adopted Resolution 2013-06, which includes a Statement of Overriding Considerations. The Board concurs with this Statement.

The Board has also independently considered the significant and unavoidable environmental impacts and benefits of the proposed project. The benefits of the project include increasing the level of flood protection for the Counties of Butte and Sutter and progress towards the state's mandate for 200-year flood protection for urban and urbanizing areas. The Board finds that these benefits outweigh the unavoidable adverse environmental effects of the project. As a result, the Board considers the unavoidable adverse environmental effects of the project to be acceptable.

10.0 – SECTION 8610.5 CONSIDERATIONS

1. Evidence that the Board admits into its record from any party, State or local public agency, or nongovernmental organization with expertise in flood or flood plain management:

   The Board will make its decision based on the evidence in the permit application and attachments, this staff report, and any other evidence presented by any individual or group.

2. The best available science that related to the scientific issues presented by the executive officer, legal counsel, the Department or other parties that raise credible scientific issues.

   In making its findings, the Board has used the best available science relating to the issues presented by all parties. On the important issue of hydraulic impacts and the computed water surface profiles, SBFCA used a HEC-RAS one-dimensional unsteady flow model that was also utilized by the USACE for the on-going Sutter Basin Feasibility Study. The model is considered by many experts

as the best available scientific tool for the purpose of modeling river hydraulics for the Feather River.

Geotechnical and overall standards for levee design including the USACE, DWR ULDC, and Board have been taken into consideration and the design is in compliance with these standards.

3. Effects of the decision on the entire State Plan of Flood Control:

   This project has positive effects on the State Plan of Flood Control as it includes features that will provide 200-year protection to urban and urbanizing areas of the Sutter Basin. The Board finds that none of the changes in project design between the 65 to 100 percent issued for bid design levels result in adverse hydraulic impacts on the entire State Plan of Flood Control.

   When USACE Section 408 approval is granted via Record of Decision and Letter of Permission, it will be based upon determination that such alterations will not be injurious to the public interest and will not impair the usefulness of the SRFCP.

   In California Statutes of 2007, Chapter 641 (SB276), the Legislature found and declared that “The projects authorized in Section 12670.14 of the Water Code will increase the ability of the existing flood control system in the Sacramento Valley to protect urbanized areas within Sutter County against very rare floods without altering the design flows and water surface elevations prescribed as part of the SRFCP or impairing the capacity of other segments of the SRFCP to contain these design flows and to maintain water surface elevations. Accordingly, the projects authorized in that section will not result in significant adverse hydraulic impacts to the lands protected by the SRFCP and neither the Board nor any other State agency shall require the authorized projects to include hydraulic mitigation for these protected lands.”

4. Effects of reasonable projected future events, including, but not limited to, changes in hydrology, climate, and development within the applicable watershed:

   The project would have no net increases in operational greenhouse gas (GHG) emissions impacting climate change. Emissions associated with the project would occur over a finite period of time (2 year) as opposed to operational emissions, which would occur over the lifetime of a project.

11.0 – STAFF RECOMMENDATION

Staff concludes that the proposed Area C construction phase of the FRWLP, to be constructed as described in SBFCA's 100 percent "Issued For Bid Set", dated March 13, 2013, and in Addendum Nos. 1 and 2, will result in an overall betterment to the SRFCP and State Plan of Flood Control, and will be consistent with the adopted 2012 Central Valley Flood Protection Plan.

Staff further concludes that the proposed project alterations can be constructed in a manner not injurious to the public interest and that will not impair the usefulness of the SRFCP.

Staff therefore recommends that the Board:

- approve Draft Permit No. 18793-1, conditioned upon receipt of Section 408 Record of Decision and Letter of Permission from the USACE (See Exhibit A) when received),

- approve, pursuant to CCR 23, §§ 11(a) and (b) with regard to Variances to Board Standards, the requested construction variances summarized in Section 8.5 herein, and further detailed in Attachments – J, – K, and – L,

- delegate authority to the Executive Officer to make non-substantive changes to the draft permit as needed to incorporate additional design changes submitted by SBFCA prior to receipt of the USACE ROD and LOP. If substantive changes to the draft permit are required, the Board staff will bring the permit back to the Board at a future meeting to seek approval for substantive changes,

- adopt the CEQA findings and Resolution 2013-07 (Attachment – C),and direct staff to file a Notice of Determination with the State Clearinghouse.

- direct the Executive Officer to review and issue encroachment permits to owners of pipeline crossings within Project Area C that will be reconstructed as part of the Area C project, and as detailed in Section 8.5.5 herein,

- direct the Executive Officer that if, during construction, additional non-conforming encroachments or constructability issues are discovered by any party SBFCA will consider whether or not they can be brought into compliance during construction, and if they can and SBFCA proposes to do so, Board staff will evaluate the

proposal(s) for Board approval to be made either by direct Board action or by delegation to the Executive Officer as appropriate.

12.0 – LIST OF ATTACHMENTS

A. Location Map
B. Draft Permit No. 18793-1
   - Exhibit A: USACE Section 408 Record of Decision and Letter of Permission (anticipated late July 2013)
   - Exhibit B: DWR M.A.16 (RD 777) Endorsement
   - Exhibit C: LD 1 and LD 9 Endorsements
C. Board Resolution 2013-07
D. Section 408 Request Letter, October 30, 2012
E. Construction Phasing Map
F. Typical Cross-Sections
G. Project Plan Views and Details: Volume 3 Dwg.G-007 & G-008; Volume 4 Dwg. G-002; Yuba City pipe Vol.3 Dwg.C-506
H. Water Surface Profiles
I. Parcel Maps and ownership
J. Variance Category 1 – Issues raised by Board staff in October 2012 Section 408 Request Staff Report
K. Variance Categories 2 and 3 – Requested Pipe Variances and Time Variances
L. Variance Category 4 – Levee Earthwork Variances
M. Flood management measures by reach

Coordinated by:	Deb Biswas, Engineer, Projects Section
Prepared by:	David Williams, Senior Engineer, Projects Section
Hydraulics Review:	Sungho Lee, Engineer, Projects Section
Encroachment Review:	Alison Tang, Engineer, Encroachment Section
Geotechnical Review:	Deb Biswas, Engineer, Projects Section
Document Review:	Eric R. Butler, Projects and Environmental Branch Chief
	Len Marino, Chief Engineer

Meeting of the Central Valley Flood Protection Board
September 27, 2013

Staff Report

Sutter Butte Flood Control Agency, Feather River West Levee Project
Amendment to Permit No. 18793-1
Project Area C (Reaches 13 through 25)

1.0 – REQUESTED ITEM

Consider approval of an amendment to Board Permit No. 18793-1, which includes three variances to Board standards.

Consider approval to send a letter (Attachment B) to the U.S. Army Corps of Engineers (USACE), Sacramento District, requesting a Project Design Change pursuant to requirements stated in USACE Letter of Permission dated September 19, 2013, page 3, paragraph c (Attachment C).

2.0 – APPLICANT

Sutter Butte Flood Control Agency (SBFCA)

3.0 – PROJECT LOCATION

SBFCA Feather River West Levee Project (FRWLP), Project Area C, Reaches 13 to 25 in Sutter County (Attachment A).

4.0 – AUTHORITY OF THE BOARD

- California Code of Regulations, Title 23 (CCR 23), §11, Variances
- CCR 23, §120 (a)(13),(15),(18), Levees
- CCR 23, §121, Erosion Control
- Rivers and Harbors Act of 1899, Title 33 United States Code, § 408, hereafter referred to as Section 408

5.0 – PROPOSED VARIANCES TO BOARD STANDARDS DUE TO UNANTICIPATED CONSTRUCTION CONDITIONS

Section 11 of the Board's regulations require that permitted uses inconsistent with Board standards as outlined in CCR 23, Article 8 require a variance approved by the Board. SBFCA has sufficiently described the need and justification for the following requested variances to Board standards:

- CCR 23, §120; Levees, subsection (a) paragraph (13) – proposed use of a method specification to achieve desired relative density of levee backfill in lieu of ASTM testing methods
- CCR 23, §120; Levees, subsection (a) paragraph (15) – proposed increase in maximum allowable particle size from three (3) to eight (8) inches
- CCR 23, §120; Levees, subsection (a) paragraph (18) – proposed increase in the maximum fill material lift thickness from six (6) to twelve (12) inches

6.0 – PROPOSAL AND STAFF REVIEW

Levee rehabilitation for the FRWLP generally involves installation of a soil-bentonite cutoff wall, which requires the temporary degrading of the levee to about half its height during construction. In order to address unanticipated quantities of cobble greater than three (3) inches and up to eight (8) inches in the degraded levee material, SBFCA is requesting an amendment to Board Permit No. 18793-1 to allow reuse of the larger cobbles.

The justification for amending the permit is described in detail in the SBFCA Executive Summary dated September 25, 2013 (Attachment D) and is summarized as follows:

1. Increase the permitted maximum particle size from three (3) to eight (8) inches in the rebuilt upper levee in areas outside the clayey core

2. Increase the maximum lift thickness of soil layers from six (6) to twelve (12) inches in the rebuilt upper levee in areas outside the clayey core

3. Allow use of a method specification to achieve desired relative density of levee backfill in lieu of ASTM testing methods

These variances will allow intelligent and efficient reuse of the onsite materials to reconstruct the degraded levee, and will result in a safer levee project than that originally designed when more sandy soils were anticipated.

On Monday, September 23, 2013 Board staff met with representatives from SBFCA, USACE, the Department of Water Resources, and the FRWLP Independent Panel of Experts to review the SBFCA proposal. The meeting concluded with all parties in agreement that the SBFCA proposal is acceptable.

6.1 – Replacement of Existing Slope Protection (Stockpile A)

The approved project design identified a 560-foot long waterside slope protection zone composed of cobbles which is slated for replacement. This material is currently placed in Stockpile A, as described on page 1 of SBFCA's proposal (Attachment D). Board staff will require, by permit condition, that any replacement of this material will be done in a manner compliant with CCR 23 §121.

7.0 – USACE APPROVALS

Prior USACE approvals for construction of the FRWLP, Area C project are as follows:

- USACE Sacramento District Letter of Permission, dated September 19, 2013 (Attachment C)
- USACE Washington DC Headquarters Section 408 Record of Decision, dated September 13, 2013 (Attachment C)

8.0 – NEPA / CEQA ENVIRONMENTAL CONSIDERATIONS

The design changes proposed herein will, if approved, be appropriately conditioned in the amended permit, and constructed such that they will be compliant with all approved National Environmental Policy Act (NEPA) and California Environmental Quality Act (CEQA) project documents.

9.0 – STAFF RECOMMENDATION

Board staff concludes that the changes proposed herein and further described in the attachments to this Staff Report will result in an overall betterment to the Sacramento River Flood Control Project (SRFCP) and State Plan of Flood Control, and will be consistent with the adopted 2012 Central Valley Flood Protection Plan.

Board staff has determined that this proposal to approve a deviation from SBFCA's Final Plans for the approved FRWLP will not be injurious to the public interest, and will not impair the usefulness of the SRFCP.

Staff therefore recommends that the Board:

- approve sending a letter (Attachment B) in substantially the form provided, to the U.S. Army Corps of Engineers, Sacramento District, requesting a Project Design Change pursuant to the requirements of the USACE Letter of Permission dated September 19, 2013 and Record of Decision dated September 13, 2013,

- delegate authority to the Board's Executive Officer to sign the letter on behalf of the Board,

- approve construction variances to Board standards pursuant to CCR 23, §11, and §120(a)(13),(15) and (18),

- approve, subject to USACE approval, amending Permit No. 18793-1 to include the above Board-approved variances, and to incorporate any additional conditions required by the USACE.

Staff also requests that the Board, in order to expedite future unanticipated requests to further modify Permit No. 18793-1 that it:

- delegate authority to the Executive Officer to request USACE Sacramento District approval for future deviations from the Final Plans proposed by SBFCA in response to unanticipated changes in field conditions or to field investigations,

- delegate authority to the Executive Officer to, subject to future USACE approval, modify the issued permit to authorize additional deviations from the Final Plans.

10.0 – LIST OF ATTACHMENTS

A. Location Map
B. Project Design Change Request (Draft Letter)
C. USACE Section 408 Letter of Permission (September 19, 2013) and Record of Decision (September 13, 2013)
D. SBFCA Proposal (Executive Summary)

Prepared by:	Eric R. Butler, Projects and Environmental Branch Chief
Assisted by:	David Williams, Projects Section Chief
Document Review:	Len Marino, Chief Engineer

STATE OF CALIFORNIA
THE RESOURCES AGENCY
CENTRAL VALLEY FLOOD PROTECTION BOARD

RESOLUTION NO. 2013-07

FINDINGS AND DECISION AUTHORIZING ISSUANCE OF
FLOOD SYSTEM IMPROVEMENT PROJECT
PERMIT APPLICATION NO. 18793-1

SUTTER BUTTE FLOOD CONTROL AGENCY
FEATHER RIVER WEST LEVEE PROJECT
PROJECT AREA C (REACHES 13 THROUGH 24) CONSTRUCTION PERMIT
SUTTER COUNTY

WHEREAS, the Central Valley Flood Protection Board (Board), in support of the Sutter Butte Flood Control Agency (SBFCA), approved on October 26, 2012 a request to the U.S. Army Corps of Engineers (USACE) for 33 U.S.C. Section 408 (Section 408) approval to alter of 41 miles of federal flood control project levee, the Feather River West Levee Project (FRWLP), located on the west side (right bank) of the Feather River from Thermalito Afterbay in Butte County downstream to approximately 3.5 miles north of the Feather River's confluence with Sutter Bypass in Sutter County; and

WHEREAS, the SBFCA submitted an application and supporting documentation to the Board in March 2013 to construct Project Area C, the first phase of the FRWLP, including approximately 14.78 miles of levee improvements in Reaches 13 to 24 within Sutter County; and

WHEREAS, SBFCA released a Notice of Preparation initiating a 30-day public comment period on May 20, 2011 and extended the comment period to July 8, 2011; and

WHEREAS, SBFCA as lead agency under the California Environmental Quality Act, Public Resources Code sections 21000 *et seq*. ("CEQA") prepared a Draft Environmental Impact Report (DEIR) (SCH No. 2011052062, December 2012), and Final Environmental Impact Report (FEIR) (SCH No. 2011052062, April 2013), and Mitigation Monitoring and Reporting Plan (MMRP) for the FRWLP (incorporated herein by reference and available at Board or SBFCA offices); and

WHEREAS, the SBFCA Board approved the FRWLP (SBFCA Resolutions 2013-05 and 2013-06), the FEIR, and MMRP, and approved findings and a Statement of Overriding Considerations pursuant to the CEQA Guidelines (incorporated herein by reference), and filed a Notice of Determination with the State Clearinghouse on April 12, 2013; and

WHEREAS, the Boards of Levee District 1 (Sutter) and Levee District 9 (Sutter) endorsed the Project Area C application on April 16, 2013 without conditions; and

WHEREAS, the Department of Water Resources (DWR) Flood Maintenance Office conditionally endorsed the Project Area C application on May 16, 2013; and

WHEREAS, the USACE Washington DC headquarters Section 408 Record of Decision (ROD) and USACE Sacramento District Letter of Permission (LOP) are anticipated in late July 2013; and

WHEREAS, if the Section 408 request is approved by USACE, staff will review and incorporate any USACE conditions into the final permit; and

WHEREAS, Board staff completed a comprehensive technical review of SBFCA's Project Area C Permit Application No. 18793-1 including the following documents:

- Hydraulic analysis and geotechnical reports and data
- 100% Plans and Specifications
- 100% "Issued for Bid" Plans and Specifications:
- 100% Design Documentation Report
- 100% Technical Specifications
- 100% "Issued for Bid" Technical Specifications
- Addenda 1 and 2
- Draft and Final Environmental Impact Reports pursuant to the California Environmental Quality Act
- Project bid schedules; and

WHEREAS, in accordance with California Code of Regulations, Title 23 (CCR 23), § 11, the Board may grant variances to its standards for uses that are not consistent with the Board's standards. When approval of a permit requires variances, the applicant must clearly state in its application why compliance with the Board's standards is infeasible or not appropriate; and

WHEREAS, SBFCA has requested the Board to grant variances from CCR 23, pursuant to the requirements of CCR 23 § 11, and as summarized in Staff Report Section 8.5 and further detailed in Staff Report Attachments J, K, and L; and

WHEREAS, Board, SBFCA, DWR, and USACE staffs have developed a strategy to (1) update existing encroachment pipeline crossing permits to ensure that they conform to current CCR 23 regulations and USACE policies, and (2) issue encroachment permits to owners of currently unpermitted encroachments to ensure that all regulatory parties, levee maintainers, and owners will be able to accurately and efficiently track and inspect future operations and maintenance of these encroachments; and

WHEREAS, SBFCA has agreed to act on each owner's behalf to prepare all required encroachment permit application documents, obtain owner signatures, and support the Board staff's application review and permitting activities; and

WHEREAS, the SBFCA Area C construction project will:

- address major geotechnical concerns such as through- and under-seepage and related slope stability, and condition and impact of existing encroachments,
- reduce the risk of flooding for existing urban areas, agricultural commodities, infrastructure, and other properties,
- increase the level of flood protection to a targeted 200-year level for Yuba City and Live Oak consistent with the adopted CVFPP, and Senate Bill 5 (Statutes of 2008) to provide 200-year flood protection for urban and urbanizing areas,
- preserve riparian and other native habitats,
- bring encroachments surveyed by SBFCA into CCR 23 compliance while addressing 100 percent of the encroachment issues categorized by the USACE in their 2010 periodic inspections as "Unacceptable – likely to prevent performance in the next flood event."; and

WHEREAS, The Board has conducted a public hearing on Permit Application No. 18793-1 and has reviewed the Staff Report and Attachments, the documents and correspondence in its file, and the environmental documents prepared by the SBFCA.

NOW, THEREFORE, BE IT RESOLVED THAT,

Findings of Fact.

1. The Board hereby adopts as findings the facts set forth in the Staff Report.

2. The Board has reviewed all Attachments, Exhibits, Figures, and References listed in the Staff Report.

CEQA Findings.

3. The Board, as a responsible agency, has independently reviewed the analyses in the DEIR (SCH No. 2011052062, December 2012) and the FEIR (April 2013) for the FRWLP which includes the SBFCA Lead Agency findings, Statement of Overriding Considerations, MMRP, and has reached its own conclusions regarding them.

4. The Board, after consideration of the DEIR (SCH No. 2011052062, December 2012) and the FEIR (April 2013) on the FRWLP, and the SBFCA Lead Agency findings, adopts the project description, analysis and findings which are relevant to the project.

5. **Findings regarding Significant Impacts**. Pursuant to CEQA Guidelines sections 15096(h) and 15091, the Board determines that the SBFCA findings, incorporated herein by reference, summarize the FEIR determinations regarding impacts of the FRWLP,

before and after mitigation. Having reviewed the FEIR and the SBFCA findings, the Board makes its findings as follows:

a. **Findings Regarding Significant and Unavoidable Impacts.**

The Board finds that the FRWLP may have the following significant, unavoidable impacts, as more fully described in the SBFCA findings. Mitigation has been adopted for each of these impacts although it does not reduce the impacts to less than significant. The impacts and mitigation measures are set forth in more detail in the SBFCA findings.

A. Air quality - The project could exceed applicable thresholds for construction emissions. SBFCA will provide an Advance Notification of Construction Schedule and a 24-Hour Hotline to Residents; implement a Fugitive Dust Control Plan and measures to reduce emissions. Fees will be paid to offset annual construction emissions to net zero.

B. Noise - The project could result in temporary construction-related noise up to 24 hours per day. To the extent feasible construction contractors shall control noise from construction activity such that noise does not exceed applicable noise standards.

C. Vegetation and wetlands - The project would result in loss of wetlands and vegetation. For direct effects on woody riparian trees that cannot be avoided, SBFCA will compensate for the loss of riparian habitat to ensure no net loss of habitat functions and values. Compensation ratios will be based on site specific information and determined through coordination with the appropriate State and federal agencies during the permitting process.

D. Visual resources - The project could result in impacts to visual resources. Viewers would experience construction in both rural and urban reaches during more than one construction season (typically April 15 to November 30, subject to conditions). In general, construction operations along the levee and at borrow sites, construction traffic, haul trucks, and staging areas would be visible in the foreground and middleground to residents, businesses, roadway users, and recreationists.

E. Cultural resources - The project could result in cumulative impacts to cultural resources. The project may result in the demolition of individual structures and residences that contribute to rural historic landscapes. Other projects that form the cumulative context may contribute to these effects through plan build-out, levee repair, or other actions requiring demolition of structures forming portions of rural historic landscapes also affected by the FRWLP. For these reasons the FRWLP may contribute to cumulatively significant and unavoidable effects on rural historic landscapes. SBFCA will develop and implement treatment for avoidance and preservation in place or relocation of individual California Register of Historic Resources that are eligible buildings (noncontributing or unaffected

buildings would remain in place). Where avoidance or relocation is not feasible standard treatment such as documentation through the Historic American Buildings Survey, Historic American Landscape Survey, Historic American Engineering Record, or district documentation will be completed. Interpretive displays, online resource, and historic contexts or walking tours may also be used, as appropriate.

Finding: The Board finds that changes or alterations have been required in, or incorporated into, the project which substantially lessen such impacts, as set forth more fully in the SBFCA findings, but that each of the above impacts remains significant after mitigation. Such mitigation measures are within the responsibility of another agency (SBFCA), and should be implemented as described. Specific economic, legal, social, technological or other considerations have rendered infeasible mitigation or alternatives that would have reduced these impacts to less than significant.

b. Findings regarding Significant Impacts that can be Reduced to Less Than Significant.

The significant impacts and the mitigation measures to reduce them to less than significant are described in the FEIR and SBFCA's Adopted Resolution 2013-06 dated April 10, 2013. This Resolution includes a Statement of Facts, Findings, Impacts and Mitigation Measures, Statement of Overriding Considerations, and Mitigation Monitoring and Reporting Program. Based on its independent review of the FEIR and SBFCA Resolution 2013-06, the Board finds that for each of the significant impacts described, changes or alterations have been required in, or incorporated into, the project which avoid or substantially lessen the significant environmental effects as identified in the FEIR. Moreover, such changes or alterations are within the responsibility and jurisdiction of another public agency (SBFCA) and such changes have been adopted by that agency. It is hereby determined that the impacts addressed by these mitigation measures will be mitigated to a less-than-significant level or avoided by incorporation of these mitigation measures into the project.

As a responsible agency, the Board has responsibility for mitigating or avoiding only the direct or indirect environmental effects of those parts of the Project which it decides to carry out, finance, or approve. The Board confirms that it has reviewed the MMRP, and confirmed that SBFCA has adopted and committed to implementation of the measures identified therein. The Board agrees with the analysis in the MMRP and confirms that there are no feasible mitigation measures within its powers that would substantially lessen or avoid any significant effect the project would have on the environment. None of the mitigation measures in the MMRP require implementation by the Board directly, although continued implementation of the MMRP shall be made a condition of issuance of the Permit. However, the measures in the MMRP may be modified without triggering the need for subsequent or supplemental analysis under CEQA Guidelines section 15162(c).

6. **Statement of Overriding Considerations.** Pursuant to CEQA Guidelines sections 15096(h) and 15093, the Board has balanced the economic, social, technological and other benefits of the Project described in Permit Application No. 18793-1 against its significant and unavoidable impacts listed in paragraph 5(a) above, and finds that the benefits of the Project outweigh these impacts and they may, therefore, be considered "acceptable".

   The Board finds the project will enhance public safety in the Sutter Basin by addressing known levee and encroachment deficiencies on the west bank of the Feather River. The Feather River west levee suffers from risks of levee failure mechanisms including through- and under-seepage and related slope stability and geometry, erosion, and levee encroachments result in the immediate need for repairs to protect the people and property at risk within the project area. The health and safety benefits of the project, which would significantly reduce the risk of an uncontrolled flood that would result in a catastrophic loss of property and threat to residents of the area, outweigh the remaining unavoidable environmental impacts.

7. **Custodian of Record.** The custodian of the CEQA record for the Board is its Executive Officer, Jay Punia, at the Board offices at 3310 El Camino Avenue, Room 151, Sacramento, California 95821.

Considerations pursuant to Water Code section 8610.5.

8. **Evidence Admitted into the Record**. The Board has considered all the evidence presented in this matter, including the original application for Permit No. 18793-1 and technical documentation provided by SBFCA on the FRWLP past and present Staff Reports and attachments, the Environmental Impact Report on the FRWLP (Draft and Final Versions), SBFCA Board Resolutions 2013-05 and 2013-06 including findings, Statement of Overriding Considerations, and the MMRP.

9. **Best Available Science**. In making its findings, the Board has used the best available science relating to the issues presented by all parties. On the important issue of hydraulic impacts and the computed water surface profiles, SBFCA used a HEC-RAS one-dimensional unsteady flow model that was also utilized by the USACE for the on-going Sutter Basin Feasibility Study. The model is considered by many experts as the best available scientific tool for the purpose of modeling river hydraulics for the Feather River. Geotechnical and overall standards for levee design including those of the USACE, DWR ULDC, and Board have been taken into consideration and the design is in compliance with these standards.

10. **Effects on State Plan of Flood Control**. This project has positive effects on the State Plan of Flood Control as it includes features that will provide 200-year protection to urban and urbanizing areas of the Sutter Basin. The Board finds that the 65 percent projects designs used to support the program-level Section 408 request, and none of the changes in project design made subsequent to 65 percent design up to and including the

100 percent issued for bid design and Addenda A and B result in adverse hydraulic impacts on the entire State Plan of Flood Control.

The Board further finds that the proposed Area C construction phase of the FRWLP, to be constructed as described in SBFCA's 100 percent "Issued For Bid Set", dated March 13, 2013, and in Addenda Nos. 1 and 2, will result in an overall betterment to the SRFCP and State Plan of Flood Control, and will be consistent with the adopted 2012 Central Valley Flood Protection Plan.

The Board further finds that the proposed project alterations can be constructed in a manner not injurious to the public interest, and that will not impair the usefulness of the SRFCP.

In California Statutes of 2007, Chapter 641 (SB276), the Legislature found and declared that "The projects authorized in Section 12670.14 of the Water Code will increase the ability of the existing flood control system in the Sacramento Valley to protect urbanized areas within Sutter County against very rare floods without altering the design flows and water surface elevations prescribed as part of the SRFCP or impairing the capacity of other segments of the SRFCP to contain these design flows and to maintain water surface elevations. Accordingly, the projects authorized in that section will not result in significant adverse hydraulic impacts to the lands protected by the SRFCP and neither the Board nor any other State agency shall require the authorized projects to include hydraulic mitigation for these protected lands."

11. **Effects of Reasonably Projected Future Events**. The project would have no net increases in operational greenhouse gas (GHG) emissions impacting climate change. Emissions associated with the project would occur over a finite period of time (2 year) as opposed to operational emissions, which would occur over the lifetime of a project. There are no other foreseeable projected future events that would impact this project.

Other Findings/Conclusions regarding Issuance of the Permit.

12. This resolution shall constitute the written decision of the Board in the matter of Permit No. 18793-1.

Approval of Encroachment Permit No. 18793-1.

13. The Board adopts the CEQA findings and Resolution 2013-07, and

14. The Board approves, pursuant to CCR 23, § 11(a) and (b) with regard to Variances to Board Standards, the requested construction variances summarized in Staff Report Section 8.5 and further detailed Staff Report Attachments J, K, and L, and

15. Based on the foregoing, the Board hereby conditionally approves issuance of Permit No. 18793-1 in substantially the form provided by the Board Staff at the May 24, 2013 meeting of the Board, subject to receipt, review and incorporation of conditions required

by the USACE in their Record of Decision and Letter of Permission anticipated to be received by late July 2013, and

16. The Board delegates authority to the Executive Officer to make non-substantive changes to the draft permit as needed to incorporate additional design changes submitted by SBFCA prior to receipt of the USACE ROD and LOP, and that if substantive changes to the draft permit are required, the Board staff will bring the permit back to the Board at a future meeting to seek approval for substantive changes, and

17. The Board directs the Executive Officer to take the necessary actions to prepare and execute Permit No. 18793-1 and all related documents and to prepare and file a Notice of Determination pursuant to the California Environmental Quality Act for the Feather River West Levee, Project Area C construction project, and

18. The Board directs the Executive Officer to consider applications to amend existing or issue new encroachment permits to owners of pipeline crossings within Project Area C that will be reconstructed as part of the Area C project, and as detailed in Staff Report Section 8.5.5. Board staff will evaluate the proposal(s) for potential approval by direct Board action or by delegation to the Executive Officer as appropriate, and

19. The Board directs the Executive Officer that if, during construction, additional non-conforming encroachments or constructability issues are discovered by any party SBFCA will consider whether or not they can be brought into compliance during construction. Board staff will evaluate the proposal(s) for potential approval by direct Board action or by delegation to the Executive Officer as appropriate.

PASSED AND ADOPTED by vote of the Board on July 24, 2013, 2013

William H. Edgar
President

Jane Dolan
Secretary